

Finding answers
together



Strategic Plan
2019 | 2022



Table of content

Global challenges and our ambition	4
Our research	10
Our education and students	20
Impact: our value for society	30
Our people, organisation and resources	38
Our invitation	48
Change Performance Indicators	50





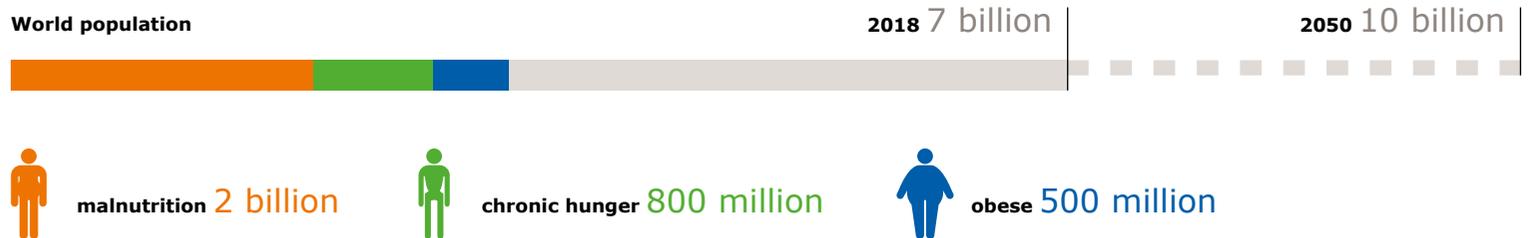
A satellite view of Earth's surface, showing a mix of green landmasses, blue oceans, and white clouds. The perspective is from a high angle, looking down at the planet. The text "Global challenges and our ambition" is overlaid in white on the left side of the image.

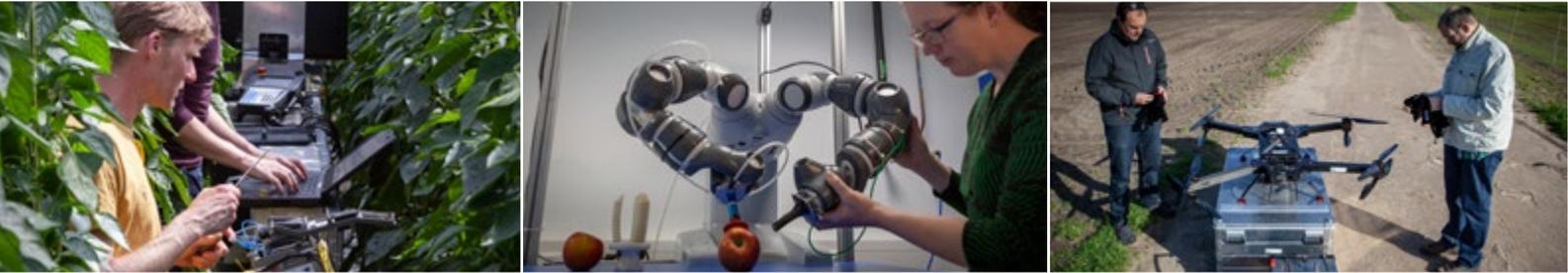
Global challenges and our ambition

In the 21st century we face major global challenges crossing the borders of nations and sectors. Humanity is over-consuming nature and the planet's natural resources, malnutrition continues to exist worldwide, urban centres are becoming overpopulated, and the climate is changing rapidly.

In 2050, close to 10 billion people will inhabit the earth, and the demand for healthy and sustainably produced food will be higher than ever. Globally, 800 million people currently suffer from chronic hunger and about two billion from malnutrition. In striking contrast, obesity and related illnesses dominate the western world. Along with these problems, we are confronted with the global spread of infectious diseases related to our food systems. We have the power to meet these challenges, but only if we drastically change our current food production systems, distribution systems, eating habits and curtail food waste.

The United Nations expects that in 2050 almost 70 per cent of the global population will live in urban areas. These overpopulated urban centres are already confronted with degraded air quality; reduced water availability and green space; problems with waste removal and the supply of food and energy. In contrast, rural areas are rapidly emptying, and we face the challenge to keep these areas attractive and well serviced and to retain enough farmers for sustainable agriculture. We aspire to cities and metropolitan areas that – in close relationship with the surrounding rural areas – are liveable, healthy, food secure, and adaptive to climate change. Simultaneously, we want to maintain the integrity and economic viability of rural areas.

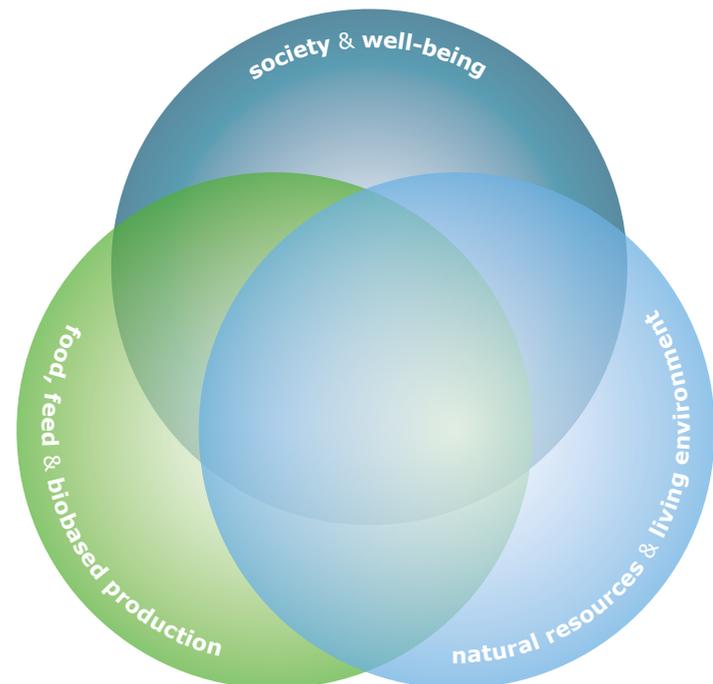




Life on earth demands a sustainable use of our planet's resources. Current consumption and production systems deplete resources, drive deforestation and biodiversity loss, pollute fresh and marine water, and degenerate soil. Rising populations, growing economies and higher standards of living have increased greenhouse gas emissions to the detriment of the planet. Climate change, one of the gravest concerns of our time, has strongly shifted where and how we can live, consume and produce. To sustain our planet, we urgently need to value nature as a partner that supplies 'life and life support' and not just as a resource to be exploited.

Healthy food and the living environment are impacted by digital connectivity, the increasing role of sensors and robotics, the collection and combination of (big) data and the growing importance of artificial intelligence. These new technologies can be harnessed to address the pressing issues of healthy food and a sustainable environment, but they also create social-technological, ethical and privacy dilemmas. If used correctly, these new technological opportunities can positively affect research, education and didactics, open science, social engagement and stakeholder involvement.

Our domain: healthy food and living environment



Main system transitions in our domain



The described global challenges call for disruptive transitions in our domain. Transitions can only be achieved if we can change social, economic and environmental drivers and determinants including the design of institutions and the behaviour of individuals. Global transitions are complex and often come with difficult trade-offs between different goals and interests.

Our current agri-food systems need to transform towards a circular agriculture. Considering earth's finite resources, the world's current and future needs for nutritious food can only be sustainably met by circular agri-food systems that optimise resource use at the farm, local, regional, national and transnational levels. Circular food systems are founded on regenerative natural resources; maximum reuse and recycling; minimal loss of resources to air, water and soil; and healthy crops and animal welfare. In circular agri-food systems, changing one segment of the food chain can easily initiate significant, unexpected, wanted and unwanted consequences in others.

To sustainably transform agri-food systems, we also need to change what we consume and produce. By 2050, humans will consume more animal proteins than ever, driven by an increasing population and improved standards of living. This

consumption level will deplete our natural resources. Hence, we need a transition towards eating proteins from more diverse sources. This shift obligates us to change our consumption behaviour as well as to develop, produce and introduce a wider variety of new tasty, healthy and sustainably produced protein-rich foods.

Together with the above two transitions, the world must transform itself from a fossil-resource based economy to a circular biobased economy. This transition calls for a growing use of biomass to produce chemicals, construction materials, plastics and energy. Increasing demand for, and use of, biomass have consequences for land use (agriculture, forestry), use of the sea (seaweed, fisheries, aquaculture), production technology and (re)use of bio-based materials and products.

These and other transitions require major changes in our relationship with, our attitude towards, and our protection and 'construction' of nature and biodiversity. Our relation with terrestrial and marine nature has radically changed the earth and ignited societal controversies on animals, biodiversity and natural resource exploitation. We need to build a broader consensus on what society considers nature and how we engage and interact with it.





Our ambition

Wageningen University & Research (WUR) is a globally leading university and research organisation in the fields of agriculture, healthy food and the living environment. We continue 'to explore the potential of nature to improve the quality of life'. Rooted in the Netherlands, we collaborate with academic partners, companies, public agencies and NGOs worldwide on the global, regional and local challenges and transitions.

WUR provides the highest quality knowledge, education and research to address global challenges and to design and accelerate required transitions. In doing so, we take our responsibility to develop innovative technological, social and nature-based solutions that help build bio-circular agri-food systems. These solutions also contribute to protect nature, enhance biodiverse ecosystems and support liveable urban and rural communities.

An aerial photograph of a lush green valley. In the foreground, a patchwork of vibrant green and golden-brown agricultural fields is visible, separated by small trees and paths. A winding river flows through the middle ground, reflecting the sky. The background features rolling green hills and mountains under a bright blue sky with scattered white clouds. The overall scene is a beautiful representation of a rural landscape.

Our research

Our research is driven by our desire to understand and to contribute to the world's challenges and the transitions that lie before us.

In Wageningen we encompass the entire chain of knowledge, from curiosity-driven fundamental research to science-based and up-scalable practical knowledge to create solutions that have impact. WUR's excellent research teams sustain our high

ranking in our domain. They work disciplinarily, interdisciplinarily and transdisciplinarily with companies, NGOs, governmental agencies, research partners and society.

Our science fields and investment themes

The reputation of WUR is built on excellent independent research in both fundamental and applied sciences. Wageningen University and Wageningen Research combined into one organisation can quickly translate breakthroughs in fundamental knowledge into practical applications like technological innovations or new government policies.

Our science groups work in five science fields. *Agrotechnology and food sciences* research focuses on healthy delicious and fresh food, environmental technologies, biobased products and food safety. *Plant sciences* researches plants at various aggregation levels: from genes to the interactions between

cells and from plants and crops in farming systems to whole ecosystems and production. Research in *animal sciences* focuses on the performance of animals in natural and food production systems, and on transforming these systems to become more nature based, climate-smart, healthy and circular. In *social sciences* research concentrates on exploring and understanding the interaction between institutions, practices and social change, often in relation to the biophysical world of natural resources and technologies. Our *environmental sciences* aim to understand processes in our living environment and to develop nature-based solutions for a sustainable world. In our research we powerfully connect fundamental knowledge

and science-based and up-scalable practical knowledge in and across these science fields. **With three Wageningen-wide investment themes we accelerate the development of knowledge and innovation in our domain.**



Investment themes

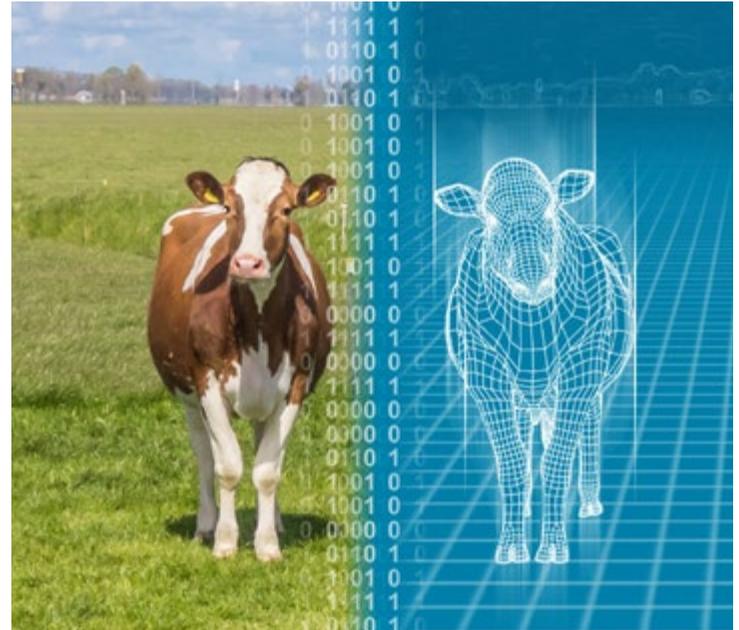
Investment-theme 1 | Connected circularity

The need is growing for circularity in separate food chains and materials segments (e.g. agriculture, food processing, consumption, waste, chemicals, materials) and at various aggregation levels. Circularity should be nature inclusive, environmentally sustainable, economically viable, resilient, and “climate neutral”. But, individual circular systems are all connected and influence each other. We will investigate the synergies and trade-offs between individual circular systems to design connected circular systems that cross segments and aggregation levels. We aim to ensure optimal use and valorisation of renewable resources (biomass).



Investment-theme 2 | The protein transition

Proteins are the building blocks of life on earth. Both their quantity and quality in food play a major role in human and animal health. Currently, a significant part of proteins are consumed through animal-based products. However, our planet's increasing demand for animal protein is outpacing our planet's carrying capacity. We need to transition to more sustainable protein production and consumption. Plant-based proteins and new sources, like insects and seaweed, offer sustainable and economically attractive alternatives in addition to meat. This theme considers how this protein transition can be facilitated and what its biological, health and social/societal consequences, and feasibility are.



Investment-theme 3 | Digital twins

Humanity is increasingly building digital images of real objects. These "digital twins" are created for living objects, such as cells, plants, animals, people and ecosystems, as well as for non-living objects, for instance, food and supply chains. Digital twins are created by deploying sensors and new sensing techniques, in combination with increased data connectivity, interconnected computing systems and artificial intelligence. They can be used not only to understand, describe and analyse reality, but also to predict the future state of those objects. This technological exploration needs to be accompanied by an understanding of ethical and societal limits to its potential applications.

How we conduct research

With disciplinary research we create a solid and essential base for inter- and transdisciplinary activities. Interdisciplinary scientific teams and projects connect biological, technological and social sciences. Our teams collaborate with many national and international academic and research organisations like Eindhoven University of Technology for sensors, robotics, ICT and data sciences and Utrecht University in human medicine, veterinary medicine and curative health. In this strategic plan period **we will strengthen our network with partners that complement our knowledge and expertise**. New partnerships, for instance, with Artificial Intelligence scientists or with the creative industry, will create novel and unexpected insights and knowledge to design transitions in our domain.

We work not only with academic partners and research organisations but also with agriculture, industry, government and NGOs in many transdisciplinary projects and citizen-science approaches. In these partnerships we co-create and translate

our knowledge to markedly improve and innovate these sectors locally and globally. We collaborate with many major companies, with SMEs and with innovative start-ups in bilateral projects, public private partnerships and EU or NWA¹ consortia.

We strive to remain the leading research organisation in our domain. Excellent WUR scientists publish in high-ranking journals and win prestigious competitive grants like 'Vernieuwingsimpuls', 'NWO Zwaartekracht' and ERC. Their achievements attest to the quality of our research. But, research is always a team effort. **In the coming years, we want to broaden the emphasis on excellence from individual performance to team performance.**

Excellent science compels us to maintain high standards in how we conduct research, in how we handle data and in how we communicate results. In 2018, Wageningen University & Research publicly committed itself to these standards when it

¹ Nationale Wetenschapsagenda / Dutch National Research Agenda



signed the new Netherlands Code of Conduct for Research Integrity. All our scientists act according to its five principles: honesty, scrupulousness, transparency, independence, and responsibility in all research programmes. **We embrace developments and policies in Open Science in line with the National Plan Open Science and will implement them in the coming years.** Accordingly, WUR aims to make scientific publications from our publicly funded research publicly available through Open Access. In the context of "WUR is serious about data", a research data management policy will be implemented based on FAIR principles (Findable, Accessible, Interoperable and Reusable) with the leading principle: as open as possible, as closed as needed.

Impact is at the core of our existence. We enhance impact by systematically including value creation when we design new research programmes and by continuously monitoring and evaluating our impact. This process is part of the Standard

Evaluation Protocols we use for Wageningen Research and Wageningen University research. We carefully review our impact from the perspective of citizens, societal organisations, industry and government.

A significant amount of university research is carried out by PhD candidates in six graduate schools responsible for PhD education and quality control. In this strategic plan period we will decide whether it is opportune to develop a Professional Doctorate in Engineering (PDEng).

For the Ministry of Agriculture, Nature and Food Quality Wageningen Research executes statutory tasks (WOT) in six programmes and two policy supporting programmes (BO). Development of new knowledge specifically at Wageningen Research is organised into five new robust programmes (see page 16).



In this strategic plan period **we will organise the development of new knowledge for Wageningen Research in five robust programmes²**. These programmes will be supported by a significant increase in governmental finances. All programmes are aligned with the agendas of the Ministry of LNV and other ministries, the top sectors, the Sustainable Development Goals and the European agenda.

Circular and climate-neutral

Circular systems in the blue & green economy will close water, nutrient and carbon cycles and minimise resource loss. We will develop knowledge to build a circular and climate robust society to prevent, mitigate, live and adapt to climate change. Integrated systems are designed by making smart connections between terrestrial supply chains (plant and animal based) and marine production chains. This includes efficient use of land, water and energy, as well as carbon sequestration. Efficiently using resources in the food, feed, chemical and materials industry is crucial, while we ensure food safety and product quality.

Food security and valuing water

We contribute to Zero Hunger by combining our knowledge in the agri-food and water domains to shape the transitions towards sustainable food systems worldwide. These systems have to be demand driven, adaptive, resilient and efficient while taking into account the social and environmental consequences. Increased understanding of the water-food nexus will enable us to develop solutions and understand effects on multiple geographical and time scales.

² WR receives 'kennisbasismiddelen' from the Ministry of LNV for the execution of these programmes.



Nature inclusive and landscape

This theme serves one overarching goal: enhancing biodiversity. In the future, planning and developing processes of terrestrial and marine socio-ecological systems will take into account both the dynamics and the intrinsic value of the ecosystem as well as its economic function. In this theme we incorporate two important principles. "Biodiversity first": we encourage ourselves and our stakeholders to integrate biodiversity as a key component in project and programme delivery. "Nature inclusive": we tackle the challenges and opportunities by delivering nature-based solutions: at the appropriate scale, socially inclusive, and climate and economically resilient.

Safe and healthy

We develop new knowledge for safer and healthier food products and food production systems to provide consumers with better dietary choices. We also create novel methods to assess our food's healthiness, safety and authenticity. To regain consumer trust and public acceptance, we need to understand and to address the underlying reasons for their lack of confidence in the system. The interaction between human, animal and plant health, and the environment regarding chemical presence and use, infectious diseases and zoonoses will be studied using a One Health approach.

Data Driven and High tech

The future is digital for food systems, farming systems, health and the environment. These areas are increasingly driven by data and high tech innovations using new technologies, sensors, robotics and artificial intelligence. Wageningen University & Research plays a crucial role in enabling this digital transformation. In the coming years crucial goals will be developing Artificial Intelligence and big data analytic algorithms for agri-food and life sciences applications, designing innovative FAIRified data infrastructures that operate across scientific disciplines, and investigating human-robot interactions. Such achievements drive technical developments for different aspects of our domain like precision agriculture, individually tailored food advice, personalised health and the efficient monitoring and anticipation of climate, nature and environmental changes.



Always guaranteed a good haul of mussel seed

Always guaranteed a good haul of mussel seed: An alternative method for catching mussel seed is being developed. Thanks to Wageningen University & Research, more than one third of every catch is brought in using mussel seed capture installations (abbreviated as MZIs in Dutch). An MZI consists of floating nets that are 3 metres deep and 100 metres long.

Mussel farmers 'sow' newborn mussels in specific spots off the Dutch coast that are allocated as nurseries. The microscopically small mussel larvae attach themselves to the nets in the spring. There the mussels grow to a marketable size in one to three years. In July, the mussel seed fishers harvest the now much bigger adult mussels by brushing them off the net with large machines. The mussels are then taken to the nurseries, where a second harvest is often possible. Unlike trawling, MZI fishing doesn't damage the sea bed. Furthermore, mussel seed fishers being able to always guarantee a catch allows them to have more income security.

The Dutch Ministry of Agriculture, Nature and Food Quality, the members of the mussel industry and nature organisations have agreed that the transition to mussel seed fishing with MZIs should be completed by 2020.





An aerial photograph of a vibrant agricultural landscape. The image shows a patchwork of fields in various colors: bright yellow, deep green, and dark blue. A winding stream or path cuts through the fields, and several clusters of lush green trees are scattered throughout the scene. The overall impression is one of a healthy, diverse, and well-maintained rural environment.

Our education
and students

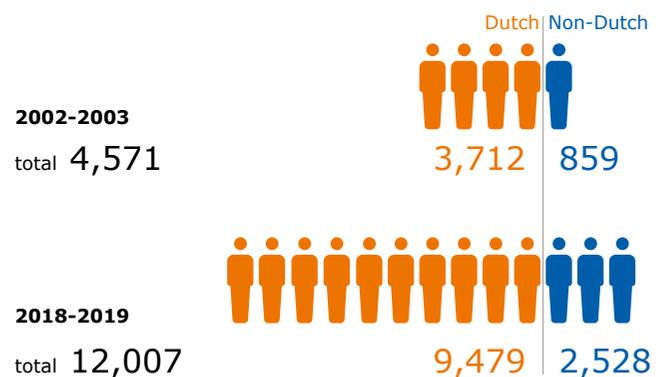
We provide students and professionals with the knowledge and skills to understand and contribute to key global transitions.

Students and professionals come to Wageningen University & Research to participate in our expanding portfolio of online and on-campus programmes, trainings and courses, all of which are combined in our Education Ecosystem. Our Education Ecosystem continuously develops through innovation and expansion of different forms of education while maintaining high quality education, educating more students, creating flexible learning paths and strengthening our diverse classrooms.

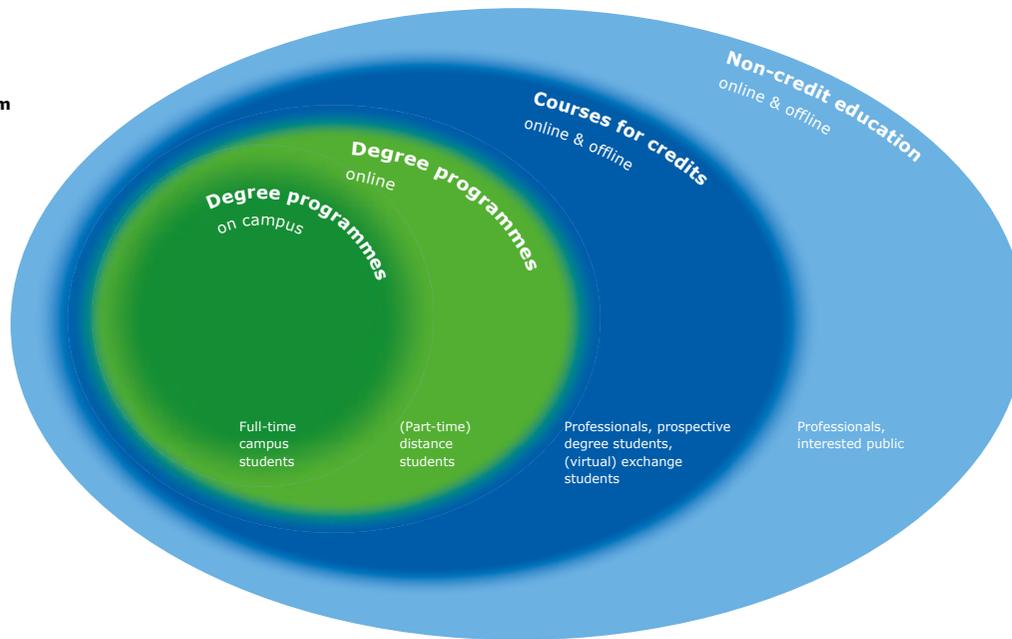
At WUR we educate students to become academic professionals who globally contribute to sustainable solutions to complex scientific and societal challenges. Our students take their social, personal and ethical responsibilities seriously. Education at WUR is student-centred, international, interdisciplinary and strongly linked to research. We offer students a personal and small-scale approach combined with more large-scale teaching methods. Our vision on education and plans for strengthening the quality of education are detailed in our Vision for Education (2017) and the Quality Agreements 2019-2024. We are an internationally renowned education institute,

proven by national and international rankings. To remain at the forefront in higher education, we need to adapt faster to the changing demands in our domain and interests of students and professionals, and to the new didactical and technological innovations. Decreasing government budgets per student, however, complicates our ability to respond to student need.

Number of students excluding PhD students



Education Ecosystem



Maintain high quality with growing student numbers

Wageningen University & Research attracts a high and growing number of qualified students. Growth is not our ambition, maintaining our high quality education and research is. However, we have limited possibilities to restrain growth. Student numbers have doubled in the last six years and are expected to increase to around 15,000 students by 2023.

The growing student numbers have significant consequences for our organisation. Our staff works hard to deliver high quality education to our growing student population, and with success. Our quality indicators and external programme evaluations demonstrate that overall we have maintained the quality of our education, despite the bottlenecks we faced. We are the best university for education in the Netherlands, and we have held this honour for 14 consecutive years. **Nevertheless, we have to take measures to sustain the high quality of our education and reduce the workload of staff.** We will deal responsibly and proactively with growing student numbers and decreasing government budget per student.

New education forms and didactic methods strengthen the quality of our education and help us to educate more students. These novel didactics broadly combine interactive and small group learning and teaching with online and large-scale teaching methods. We will recruit more staff to sustain high quality education with personal student-lecturer contact. Additional investments in facilities, our third education building, digital tools, deployment of Wageningen Research staff in education, and educational support contribute to maintaining our high quality education.

Carefully selecting students also helps to maintain quality. In some programmes, we actively curtail student enrolment with a numerus fixus if we cannot otherwise maintain the quality of education when confronted with increasing student interest. Regrettably, other selection possibilities are limited by Dutch law. Together with the Student Staff Council, we will closely monitor both the prospect and inflow of students and the effects of our measures to maintain and to improve the education quality.



102
nationalities

Up-to-date portfolio

Our portfolio has to reflect developments in science, the interest of students and the demands of the professional field. We offer state-of-the-art education not only to our Dutch and international degree students but also to professionals around the world. They come to our campus, follow our online courses or programmes, or participate in one of our joint programmes with partner universities.

In this Strategic Plan period **we will update our education portfolio to meet the transitions and demands of the international professional field.** We will assess the need for new programmes and courses for bachelors, masters, professionals and PhD candidates – such as the need for a new marine science bachelor programme – while changing or terminating those programmes that no longer match demand. In this vein, we have decided to strongly embed entrepreneurship education in existing programmes and to start tracks on data science linked to our domain. Tracks on data science may result in a new master programme. We continue to explore possibilities for new programmes in collaboration with other universities similar to the current joint programme with TU Delft at the AMS institute and our collaboration with NTU-Singapore.

Our portfolio of education for professionals is to be expanded towards a comprehensive portfolio with a variety of long and short online courses, on-campus bachelor, master and other courses, and specific tailored services focusing on different target groups in developed and developing countries. This portfolio includes master courses and programmes in Business Administration for current and future leaders.

Skills for the future

We teach our students skills to deal with highly complex and interdisciplinary global issues in a changing world. At WUR, we want students to be active and motivated to develop their talents, interests, abilities, and learning process. Our graduates are open minded, critical and investigative thought leaders who contribute to important transitions.

Students require additional skills and knowledge to be well prepared for future professions. We will teach our students to work with new and digital technologies and to deal with the accompanying ethical issues. In the coming years, students will be stimulated and facilitated to acquire personal leadership skills and to become innovative entrepreneurs. Simultaneously, we will implement the education concept 'boundary crossing', training students to collaborate with other students and societal stakeholders with different cultures, knowledge levels, disciplines and backgrounds. Students apply and practice these skills in the projects they do with societal stakeholders on real-life issues. These projects and other initiatives aim to better prepare students for their future career.



Stimulating innovative and flexible education



Students and professionals increasingly demand flexible education. This requires us to transform our education from **general learning paths to more personalised and flexible learning paths**. Flexible learning paths and diversity in programmes and courses serve the different levels, paces and interests of individual students and professionals. Online education and open educational resources are innovations that enable more flexible learning paths, such as new online premasters and micromasters. In the flexible learning paths we sustain the student-lecturer interaction.

Innovations that strengthen the quality of our education are increasingly stimulated and adopted into standard practice. We want to shift to an innovative educational climate and culture. More innovation and its adoption will be stimulated and facilitated through an incentivising funding system, a more flexible education organisation, and optimal support and exchange between lecturers, educationalists and support staff. We ask programme committees and programme directors to coordinate these innovations in their study programmes and to stimulate exchange.

We want to widely adopt innovations that stimulate and better our students, such as enriched feedback through technologies and blended learning combining online and small-scale interactive teaching methods. To achieve this, we will reap the benefits from novel technologies and applications offered by EdTech companies, such as virtual and augmented reality and serious gaming. We encourage and facilitate spin-offs as the result of innovations with these new technologies. **We will expand educational research to support evidence-based innovations that enhance the quality of our education** both alone and in collaboration with other universities and external partners, such as the 4TU Centre for Engineering Education.

We will adjust education buildings, classrooms and facilities to support innovative educational learning and teaching methods. In the near future students will bring their own device to connect to our digital facilities and infrastructure at anyplace, anytime and anywhere. Further investments in the flexibility and accessibility of our study and working environment, both digital and physical, are needed to enable innovations and flexible education.





Diverse student community

A diverse student population and internationalisation are important assets of high quality education. We prepare all our students for work and life in an international, intercultural and multi-stakeholder environment. **We continuously strengthen internationalisation and create an even more inclusive student community.** We support the international classroom by integrating international students into the Wageningen community, by improving the language skills of students and staff, and by sending our students abroad, for example, through our networks, such as Euroleague for Life Sciences. Safeguarding a balanced composition of nationalities in the international bachelor and master programmes remains a key ambition. We advocate for additional possibilities in Dutch law to select students to manage a diverse and balanced student population of different nationalities in our international classrooms.

We are committed to ensure the well-being of our students. To that end, we take measures to prevent isolation and to help students cope with stress. We continue to offer guidance and assistance through our Student Career Services, study advisors, student deans, student psychologist and general practitioners. Our support matches the changing needs of our students and the new vision of active students and personalised learning paths.



Resilient, climate-proof, liveable, healthy cities

Increasing urbanisation combined with the adverse effects of the intensifying climate extremes (floods, droughts and extreme heat) call for a new paradigm of the efficient planning and management of urban environments.

This new paradigm must maximize ecosystems and services, minimize the cities' environmental footprints and increase their adaptive capacity in relation to the changing climate, demographic and socio-economic conditions. The increasing concentration of people in urban environments means that the social, economic and environmental demands while living and working are under pressure. It is also known that greening the city increases air quality, reduces noise nuisance and reduces stress.

While in constant communication with these factors, Wageningen University & Research develops ecosystem-based planning, provides information on the ecosystem of urban green infrastructure, designs tools/approaches/guidelines to support urban development professionals and understands how to reach and cooperate with different urban groups and stakeholders.







Impact: our value
for society

Since our founding a century ago, we have been driven to find answers and to improve our world. We want to make an impact.

We create impact by providing high quality education and by carrying out innovative research with our partners. Wageningen University & Research has a proven track record on generating impact, but as a global leading knowledge institution we cannot rest on our past achievements. In this strategic plan period we will enhance our century-long tradition of generating impact,

in particular by fostering entrepreneurship and collaborating with partners to better apply knowledge. We will continue contributing to societal agendas, organising societal dialogues, connecting with our national and international alumni, and further developing our campus.

Excellent research and education with impact

In research, WUR collaborates with knowledge institutions, governmental organisations, industry, and society to find answers and to create solutions that impact the world's challenges. With these partners, we co-create, share and apply knowledge that enables all parties to innovate. We transfer our knowledge to national and international governments so they can develop effective policy and we provide insights for businesses to develop new products, new processes and new revenue models. Wageningen University & Research also responds to questions of society. Through the Science Shop and the Education Project Services (Onderwijsloket), students and researchers collaborate with social organisations to answer questions and to design solutions at the local or national level.

We educate students to become academic professionals and leaders in science, industry, government and society. Our

50,000 alumni contribute to the Sustainable Development Goals (SDGs) in and beyond their home countries and regions. In the 2019-2022 plan period **we will expand our education for alumni and professionals around the world:** on-campus, on-line and on-location. We have also planned to increase opportunities for degree students from developing and emerging economies to study in Wageningen by improving our scholarship programme and by strengthening our collaboration with public and private funding organisations.

Wageningen University & Research also collaborates with and supports Universities of Applied Sciences (HBOs), vocational education institutions ((v)MBOs), high schools and primary schools. We provide challenging and inspiring education and educational material to make these students and children better aware and knowledgeable of the global issues we face.

Entrepreneurship

We stimulate our staff and students to develop an entrepreneurial attitude by giving them the skills, freedom and incentives to conceive innovative ideas and transform these into new business with impact for society. In the coming years **we will stimulate a culture and practice of entrepreneurship through education, and by promoting student challenges, business development, and vital start-ups and spin-offs.**

Our Startlife and Starthub programmes and facilities assist starters with education, coaching, seed capital, venture capital and networks. We incorporate entrepreneurship into our curricula and make all students and staff aware of the opportunities offered by Startlife and Starthub.

Wageningen University & Research invests in bringing our findings to higher Technology Readiness Levels (TRLs). Together with our partners in the public and private sector, we expedite the implementation, upscaling and sale of our technologies. We capture our share of value – also through IP and technology transfer – to guarantee a permanent investment cycle in our knowledge, know how, human capital and facilities.



**Geheel wintervaste ROBUSTA en
WAGENINGER ZAAI-TARWE,**
van Prof. Mayer Gmelin, goedgekeurd 1e nabouw,
weerstond glansrijk den winter 1928/'29
in de Provincie Groningen.
Prijis f 23 per 100 K.G. incl. zak, bij afname van minstens
100 K.G. franco ieder Station.
Origineele WILHELMINA ZAAI-TARWE,
dezelfde prijs en voorwaarden.
Doe thans reeds Uwe opgave aan G. VAN DE MEENT,
vert. Fa. D. J. v. d. Have, te **Scheemda.**



Contributing to societal agendas

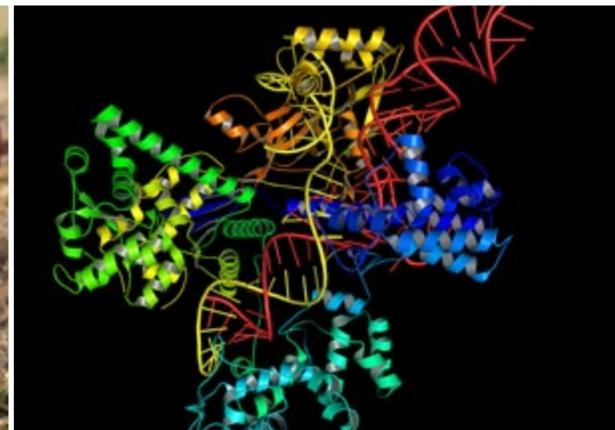
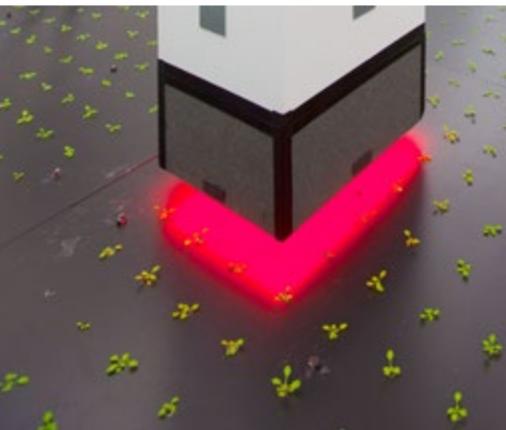
Wageningen University & Research helps in setting and achieving national, European and global agendas on comprehensive challenges and transitions.

In the Netherlands, we help to establish several agendas, including the National Research Agenda (NWA), the new vision on agriculture of the Ministry of Agriculture, Nature and Food Quality, the Climate Agenda of the Dutch government and the mission-driven programmes of the top sectors. When appropriate, we collaborate with national partners, such as the other three technical universities with whom we form the 4TU federation and the applied research institutes with whom we form the TO2 federation.

As a leading institution in agriculture, food and environment, we understand our responsibility to proactively contribute to the European Commission's agenda. In the coming four years we will expand research and innovation programmes to

contribute to Europe's objectives, often in close collaboration with similar European institutions, such as INRA and European partner universities.

Together with our international academic partners, the private sector, governments, NGOs and the philanthropic sector, we contribute to global agendas, particularly the United Nations Sustainable Development Goals (SDGs). We are especially committed to the SDGs' Zero Hunger; Good Health And Well-Being; Quality Education; Clean Water And Sanitation; Sustainable Cities And Communities; Responsible Consumption And Production; Climate Action; Life In The Water; Life On Land; and Partnerships. We aim to set global agendas with partners, such as the Agrifood 5 Alliance (Wageningen University & Research, China Agricultural University, Cornell University, UC Davis and the University of São Paulo) and the CGIAR institutes.



Fostering societal dialogues

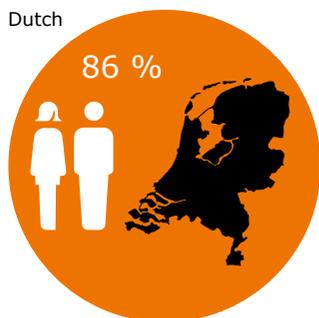
Citizens, NGOs, companies, policy-makers and politicians hold strong opinions and ideas about developments and innovations in agriculture, food, health, nature conservation and environment. Developments, innovations and suggested solutions in our domain are complex and often come with challenging trade-offs between different goals and interests. As an independent and leading knowledge institution, Wageningen University & Research fosters societal dialogues by providing an open platform to exchange and to discuss knowledge, opinions, ideas and future scenarios about these crucial developments. A Dialogue Centre will be created on our campus **to stimulate and increase societal dialogues.**

We also aim for a constructive dialogue and collaboration with the municipality of Wageningen and its citizens to jointly deal with societal issues in the city and to develop Wageningen into a living lab for innovative solutions.

Nationalities of employees Wageningen University & Research, in fte

(December 2017)

Dutch



Non-Dutch





Campus development and Shared Research Facilities

While our vision is international, our Wageningen campus in the heart of the Food Valley and the Province of Gelderland remains the centre from which we generate our impact. We will not open campuses at other locations. Our current operations, campus and infrastructure will be optimally organised for future success in education, research and value creation. A pleasant working and study environment stimulates success and collaboration. **We will further invest in and share our research facilities and infrastructures, both on campus through Shared Research Facilities and nationally.** We stimulate our campus partners to do the same. **Wageningen campus is an open innovation system with partners, customers and other external stakeholders.**



Subtle balance between taste and production process

Most people in the Western world consume too much sugar, fat and salt, leading to obesity and diabetes being the most widespread, harmful outgrowth of this eating habit. The producers of cookies, sweets and other confectionary could do more to reduce the amount of sugar in their products, but in order to do that they need advice. Wageningen University & Research provides this advice. It supports the adjustment of the production process, understanding that the balance between taste and the production process is subtle. For example, cocoa mass has to be pressed through holes when making chocolate sprinkles. If this mass becomes less sweet, the mass becomes greasier, and the holes can become clogged.

Furthermore, a shiny layer is added to the sprinkles as a part of the production process. If they are not dry enough, that process doesn't work. However by replacing sugar with cocoa, low-sugar sprinkles look darker, but the taste is creamier than the original.







Our people,
organisation
and resources

Our people generate the impact of Wageningen University & Research. They develop and disseminate new knowledge and innovations, teach students and professionals, and find answers to societal questions. Support staff assures that education and research run efficiently.

Our policies, organisation, and resources facilitate our staff's excellent work and their collaboration with colleagues, students, partners and society. Together we are OneWageningen, maximising the synergy between

Wageningen University and Wageningen Research by increasing flexibility and mobility between and within the two institutions to form effective teams that boost our collective impact.

Our people

We employ a talented academic community of researchers and lecturers who are highly skilled and strongly motivated to tackle global challenges in our domain. Our support staff likewise shares and contributes to the ambitions of WUR. We complement and strengthen our teams by attracting diverse new talent.

We want to develop the potential of our employees to enhance the quality of our work. We provide all our staff opportunities to cultivate their talents, advance their careers and continuously expand their skills and expertise. We create learning opportunities for staff needed to accelerate the transitions in

our domain and to adopt new methods and techniques in this digital age. Our staff avail themselves of these opportunities as they are equally motivated to take responsibility for their personal development.

To foster talent, we provide trainee, talent, and partner programmes for academic and support staff. We offer staff rotating assignments at other departments in the organisation to further develop themselves and share their expertise in different teams. We have designed a leadership programme for both academic and support staff to develop and to capitalise on individual leadership potential. PhD candidates are facilitated in



learning about and preparing for a career in and outside universities, and are enabled to finish their PhD thesis submission within their contract period. For this plan period we will create opportunities for educational careers in the tenure track to reinforce the importance of education. We will investigate how we can value and reward education and research more equally in our tenure track system.

More flexibility and internal mobility between Wageningen University and Wageningen Research and within the two institutes create opportunities for staff to collaborate with other disciplines and experts in the organisation and to develop themselves. Flexibility and mobility will foster more effective and excellent teams who elevate our research, education and operations to a higher level, as diverse individuals complement and creatively stimulate each other. Interdisciplinary teamwork is crucial to accelerate societal transitions. We want to **increase staff diversity in terms of**

disciplines, gender, nationalities, age, experience and competences and to help teams benefit from this diversity.

Increased demand of knowledge and solutions in our domain, the growing student numbers, continuous changes in our environment and inadequate financial resources have increased our staff's workload. We find it important that we support and nurture our staff and that they consider our institution a healthy working environment. Wageningen University & Research is taking measures to reduce work pressure both at the institutional level and at the level of the Science Group and Staff Department. We will invest in measures to decrease workload, in hiring more staff, and in removing barriers to appoint them.

We will also organise our work differently by allowing new technologies and innovations to facilitate efficiency. In this new way of working, time-consuming administrative procedures are simplified, reducing bureaucracy. We want to enable and to support teams to find and implement tailored solutions to decrease the workload.

Smoothly integrating new employees into our community contributes to a healthy working environment. We continuously build an inclusive community of staff in all parts and all levels of the organisation. Together we create a welcoming environment. We foster integration by expanding activities, support and spaces to meet each other. We will increase the use and proficiency of English within our organisation and encourage a proficient level of Dutch for non-native staff and students. In this Strategic Plan period special attention will be given to integrating new non-native recruits into Dutch society.

Culture

More than ever, we want to **develop a culture of creativity based on trust, connecting to others and room to take calculated risks**. To work effectively, individuals and teams need to have a clear mandate and the freedom to achieve this mandate as they see fit. We are a supportive, transparent and learning organisation in which individuals and teams are free to experiment and make mistakes. Trust is the starting point for

flexibility and creativity. All of us are open to receiving and giving feedback on our performance and behaviour. Our ability to learn from best practices and mistakes, to adapt to changes, and to quickly apply and disseminate what we learn sets us apart from others. Simultaneously, we are keen on working together with alumni and external parties to learn and innovate together.



Our organisation, processes and governance

OneWageningen is a guiding concept to generate additional synergy between and within the two institutions Wageningen University and Wageningen Research. OneWageningen enhances cooperation by stimulating internal collaboration, removing barriers, enhancing internal mobility and providing more flexible physical and digital working environments. We increase working with flexible and agile teams to stimulate collaboration. During the plan period, we will explore organisational changes that stimulate cross-expertise knowledge, research and education.

The Chair Plan 2019-2022 of WUR contains the portfolio of regular chairs that together cover our domain. We keep the number of chair holders and chair groups constant, enlarging the groups rather than increasing their numbers. The formation of robust clusters of chair groups continues. We will increase the diversity of chair holders, especially the number of female

and international professors, and enhance the flexibility of the chair holder's role and position.

Fulfilling our ambitions requires an organisation and processes that support individuals and teams to innovate and to experiment. However, external rules and regulations are becoming more constraining and available financial resources are under pressure. To bridge this apparent contradiction of freedom and constraint, we will set clear mandates within which individuals and teams have room to manoeuvre and we will support them with timely decision making on matters that exceed their mandates.

We will implement more uniform – and more digital – processes to support working processes and their adoption. This will make us more efficient and better at working across teams and increase the mobility and flexibility between teams. New



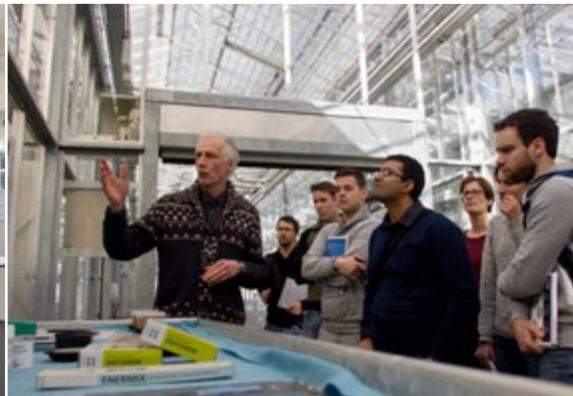
and increasing external rules and regulations as well as technological applications in education and research heighten the need for specialist knowledge and support. To meet this need, we will strengthen the collaboration between central and de-central functions, bundle expertise, and harmonise systems, tools and processes to deliver optimal support and solutions to our researchers and lecturers.

Increasing digitalisation offers opportunities to work and study more effectively. New technologies and digital processes require additional expertise and support. The supporting services will use data about the behaviour and needs of staff and students to optimise the facilitation of research and education.

As an organisation, we continue to be a front-runner in sustainability and Corporate Social Responsibility (CSR). In this Strategic Plan period we give priority to promoting the vitality

of staff and students, to offer healthier and more sustainably produced food in our canteens, and to reduce our food waste. In transforming our organisation's sustainability, we apply a Living Lab concept – an approach to provide opportunities for research and education experiments. In our procurement policies and practices, we push supply chains to be transparent, sustainable, circular and free from modern slavery.

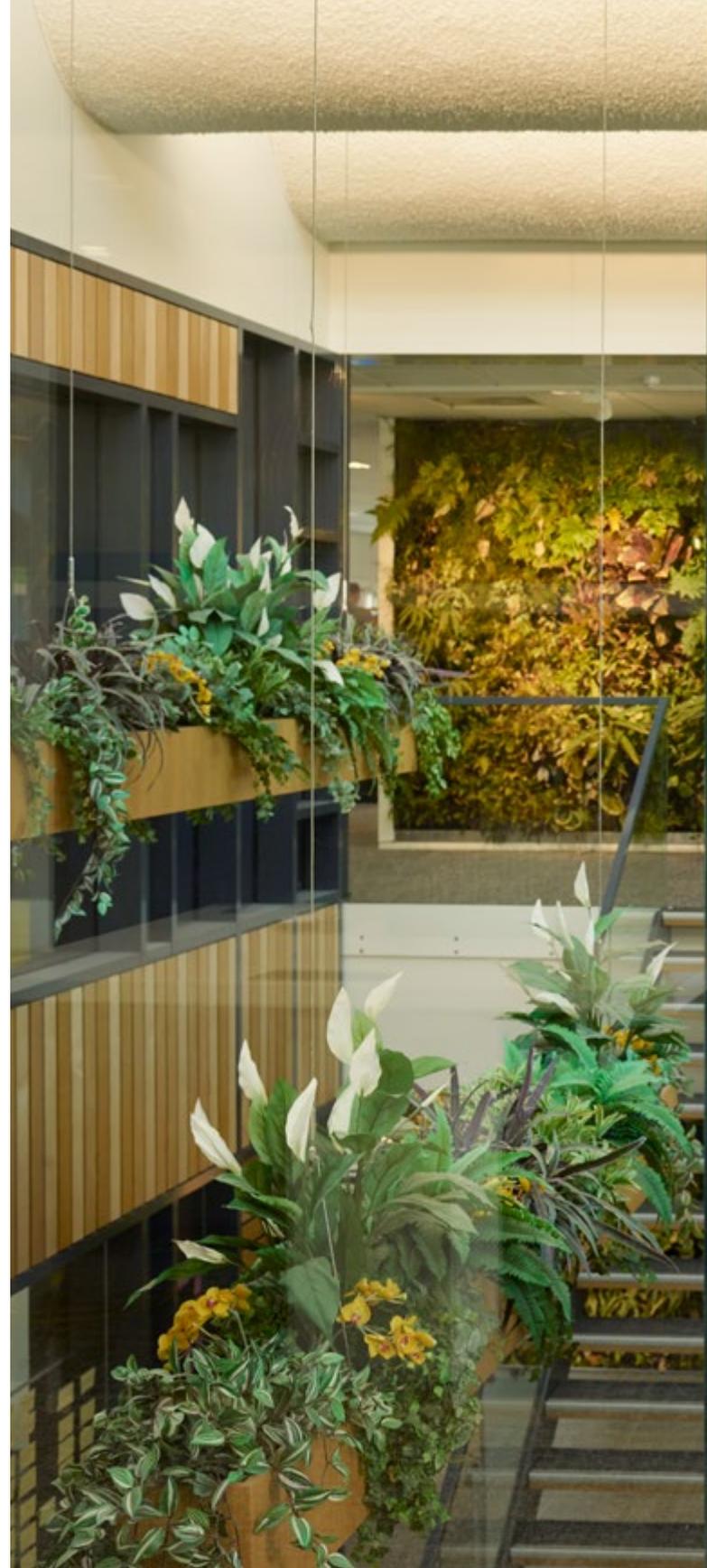
We work closely with the various participational bodies on setting the organisation's developmental direction and policy formation. Together we aim to further improve our modus operandi by including groups that are currently under-represented in the participational bodies and by involving experts from within the organisation to advise the participational bodies on specific domains or dossiers.



Financial resources

Financial resources are instrumental to achieve our ambitions. Our main funding for education and research comes from provincial programmes and national and European governmental sources. This is augmented by financial support from charity funds and third-party research and it is our ambition to increase these forms of financial support. An efficient planning and control cycle has been created to ensure we realise our plans and meet budgets. Within the boundaries of the planning and control cycle, we will explore the possibility to give staff more operational freedom to experiment and more possibilities to develop unique ideas and hire young talent.

During this strategic plan period we will focus, in particular, on strengthening Wageningen Research's business model. We want to pursue a balanced and solid customer base, including more long-term commitment in strategic partnerships. Together with our clients we want to bridge the gap between new knowledge and applications with impact. We will apply a more value-based pricing model where possible and optimise the contact-to-contract-to-cash workflow. The additional income we generate will be used to realise more targeted investments in our knowledge base, human capital and facilities. At the end of the Strategic Plan period, **we will have substantially increased investments in Wageningen Research.**









Manure, a circular resource

In circular food production with optimized use of resources, manure is an important source of valuable nutrients. However, currently manure is often disposed of as a waste stream from intensive animal production. This leads to environmental deterioration, while at the same time chemical fertilizers are being used for crop and grass production. This practice can be changed!

Wageningen University & Research supports farmers in many countries around the world to find appropriate solutions based on value creation with manure, so that manure is no longer an expensive waste but a meritorious co-product of meat, dairy and egg production. For instance, in Vietnam we helped 750,000 farmers to cook on biogas they generate themselves using manure from their livestock. Using biogas also improves the living conditions in their homes, due to better indoor air quality compared with cooking using wood or dried cow dung cakes. In other situations manure is used to produce high-quality organic compost and phosphate to improve soil quality and fertility, as well as to sequester carbon in the soil to help mitigate climate change.





Our invitation

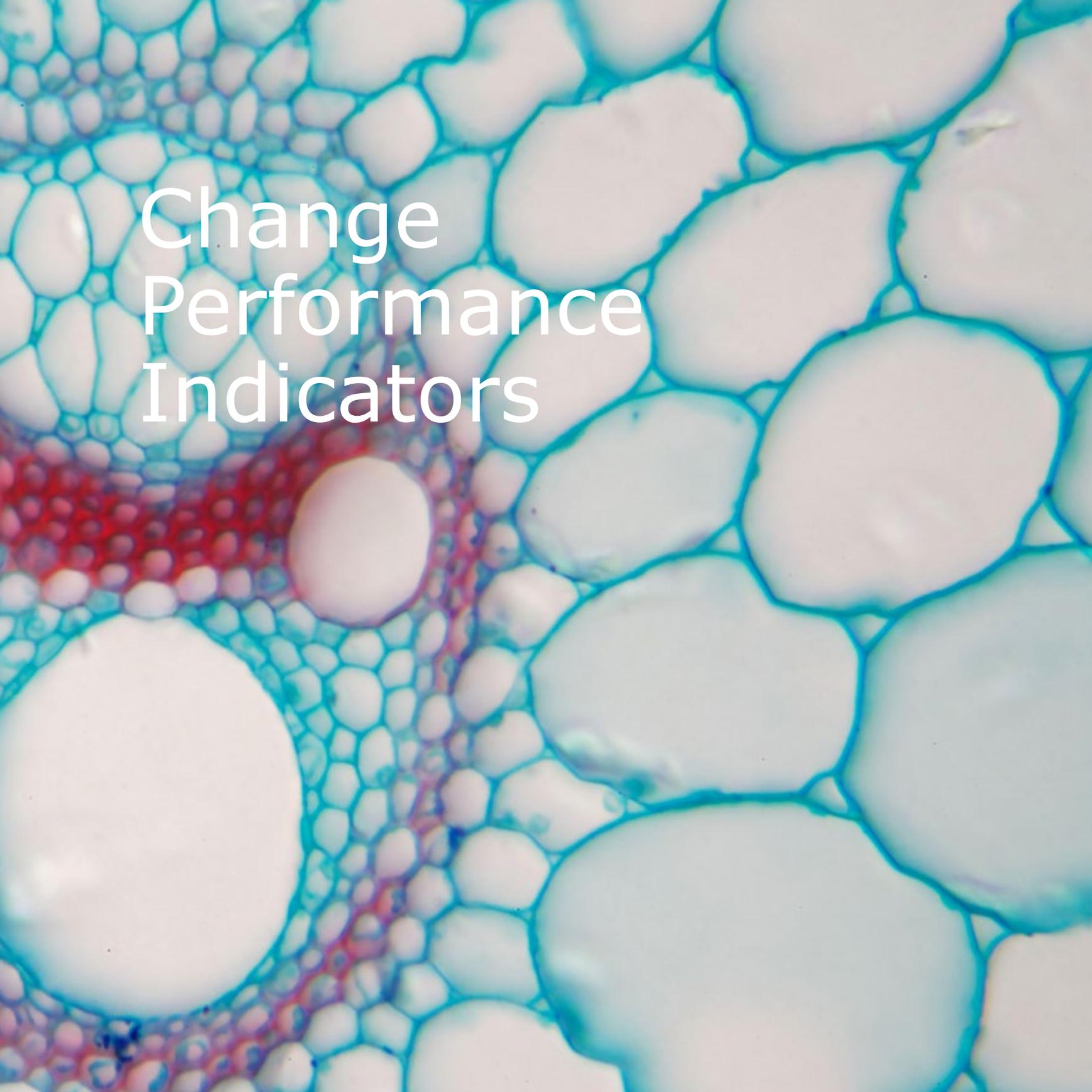
By 2050, the world population will have reached an historical high as 10 billion people inhabit earth, mostly in sprawling cities.

Without disruptive innovations people will be suffering from malnutrition, demanding and wasting more food, expending more natural resources, further affecting biodiversity, polluting land, air and water, and changing the climate.

As a principal knowledge institute, Wageningen University & Research provides high quality knowledge, education and research to address these global challenges and to design and accelerate the necessary transitions. But, we cannot do this alone. We need partners – both our current and new ones – to tackle and resolve these critical global challenges.

In this strategic plan period, we will strengthen our national and international partnerships and explore new partnerships to co-create and apply novel and unexpected knowledge. With our collective strengths, we can develop new initiatives, innovate our ways of working and educate the future leaders to solve the global challenges we are facing today and those we will meet tomorrow.

This strategic plan is a call upon new and existing partners, students, alumni and citizens to explore with us the potential of nature, to participate in defining and understanding the challenges facing us, to engage in discussing and navigating trade-offs, and to work with us on evidence-based and socially inclusive answers that drive transitions. This Strategic Plan is an invitation to join us in finding answers together.

A microscopic image of plant tissue, likely a cross-section of a stem or root, stained with a blue dye. The image shows a network of cells with distinct cell walls. A prominent feature is a large, clear, circular structure in the lower-left quadrant, possibly a large vessel or a specific cell type. The text "Change Performance Indicators" is overlaid in white on the left side of the image.

Change Performance Indicators

To fulfil the ambitions in this strategic plan,
we continue many of the things we already do,
but we must also make changes.

We can only succeed in our ambitions if we maintain our global position as a top knowledge institution: this, in itself, requires change. We determined twelve Change Performance Indicators

(CPIs) to track progress on our formulated ambitions. These CPIs will be further operationalised and quantified as part of our implementation process.

- | | | | |
|---|---|----|--|
| 1 | Continuous improvement for research excellence | 7 | Expansion of our campus ecosystem and sharing of research facilities |
| 2 | Significant scientific and societal impact on the three investment themes | 8 | Increased mobility, diversity and rejuvenation of WUR staff |
| 3 | Increased focus on and assessment of team performance | 9 | Increased harmonisation of the organisation and satisfaction with internal systems and processes |
| 4 | Further integration and innovation of the Education Ecosystem | 10 | Expanded connection with society and partners |
| 5 | Increased flexibility in learning paths and in learning spaces | 11 | Enhanced culture of trust and calculated risk taking |
| 6 | Improved entrepreneurial culture and practice in education, research and value creation | 12 | Increased volume and more margin from clients and contracts in our applied research |

Colophon

Publisher

Wageningen University & Research

Text editing and coordination

Corporate Strategy & Accounts (WUR)

Graphic design, photo research and visuals

Communication Services (WUR)

Photography

Alamy (1, 18-19, 28-29), Petra Appelhof (42 left), MikeDotta / Shutterstock.com (28 middle & right), Nhã Dt (46-47), JJFarq / Shutterstock.com (28 left), Rob Goossens, Jeroen Hofman (8-9, 26-27, 44-45), Marte Hofsteenge (25, 42 middle, 43 right), Gea Hogeveen (6), NASA (4), Hutten (12), Sven Menschel (24), meunierd / Shutterstock.com (7 middle), Nicole Minneboo (36-37), Leonard Passchier (13 left), Jurjen Poeles (43 left), uit Pomologia (32 left), Jesse Reij (42 middle), RWS (18 left), Joris Schaap (23, 42 right), Shutterstock, Verse Beeldwaren (15 left), Gerard-Jan Vlekke (33 left) Hans Wolkers (7 left)

The publisher has done everything possible to credit the illustrations used. Please contact the Communication Services department if your name has been inadvertently omitted.

Wageningen, October 2019

www.wur.eu

Photo strips

Pages 14-15:

WUR contributes to the development of bio-asphalt. Lignin from trees and plants can be used as a natural binder in asphalt. You can find the world's first bio-asphalt cycling path with lignin at the Wageningen Campus.

- 1 *Lignocellulosic biomass*
- 2 *Fractionated biomass fibres*
- 3 *Separation of lignin from cellulose*
- 4 *Lignin*
- 5 *Bitumen lignin blending*
- 6 *Bio-asphalt*

Pages 32-33:

100 years plant breeding

- 1 *Plant breeding programmes used to take 50 years*
- 2 *Wilhelminatarwe: a Wageningen wheat with groundbreakingly high yields*
- 3 *Elstar apple: a commercial success of Wageningen*
- 4 *Phenotyping: selecting offspring with desirable characteristics. Genes can be tracked down more quickly and cheaply*
- 5 *Adapting crops to climate change: like a potato which can cope with less water*
- 6 *CRISPR-Cas: possibility to change DNA very subtly. Professor John van der Oost of Wageningen University & Research was the first to use this discovery for the alteration of DNA*

Chapter openings:

The Mekong Delta is one of the most productive agricultural areas of Vietnam because of its fertility. The rice harvests increased from two times a year to three times a year. As a result, Vietnam has become the third largest rice exporting country in the world. Around 40 years ago, Wageningen University & Research helped to develop this region, and recently has contributed to the Mekong Delta Plan to make the area more adaptive to the impact of climate change. The chapter images zoom in on several elements, from delta to rice plant.

