Open Science & Education

2022-2025

WAGENINGEN
UNIVERSITY & RESEARCH

Open Science & Education 2022-2025

Open Science is a more open way of conducting, publishing, and evaluating scientific research. Open Science strives for more transparency in the research process, collaboration, and reusability of knowledge. Not only among researchers and across disciplines, but also in society as a whole. Open science principles can also be applied in education, for example by sharing and reusing online learning resources. Adopting the principles of openness and transparency will contribute to a more efficient research environment and strengthen the integrity and reliability of science. "Finding answers together" is key to increasing the value of science.

Open Science and Open Education make it easier and faster to build onto each other's work. Open Science also enhances the verifiability of scientific results. Last but not least, Open Science strengthens the public's understanding of science and can contribute to their trust in it.

In recent years, the Dutch government and research and funding organisations have formulated "Open Science" as a priority area through a joint National Programme Open Science (NPOS).

On an international level, Open Science and Open Education are high on the agenda. For example, the Horizon Europe funding programme for research and innovation requires researchers to work according to open science principles.

The WUR Open Science & Education (OSE) programme has been facilitating and encouraging researchers and teachers to put OSE principles into practice since 2019, and in doing so, to also create greater scientific and societal impact.

OSE programme

Today, OSE is well known among staff and is one of the priorities of the WUR Extension & Update Strategic Plan 2019-2024. An important foundation has been laid by adopting a progressive WUR Open Access and Data Management policy and developing policy for Open Educational Resources.

WUR employees are encouraged and facilitated to apply OSE principles through practical tools, infrastructure, training courses, networks, help desks, etc.

This OSE ambition document for 2022-2025 describes how we will shape OSE in the coming years through programme lines with specific objectives. The national Recognition and Reward programme has a specific Open Science component. Local application of Open Science and Education principles in both programme evaluation protocols and in individual career paths of academics is expected to play an important role in achieving this cultural shift in the coming period.

The programme-based approach of the OSE programme in 2022-2025 links several programme lines:
1 Open Access & Open Scholarly Communication
2 FAIR data
3 Citizen Science
4 Open Education

Information about the Open Science & Education programme can be found at WUR website.

'Increasingly make Open Science & Education principles and approaches standard practice at WUR.'

Arthur Mol | Rector Magnificus and Chair of the WUR OSE Steering Committee

1 Open Access & Open Scholarly Communication

Programme line leader WUR Library

Open Access publishing accelerates innovation by making it easier and faster to build onto each other's work. It also ensures equal access to scientific publications. For researchers, Open Access publishing increases the visibility and scientific impact of their work.

Overarching goal
The Open Access & Open Scholarly Communication programme line focuses on the future-proof and sustainable accessibility of WUR scientific publications. Researchers are optimally stimulated and supported in making their publications accessible in high-quality journals, repositories, and platforms as soon as possible, at no cost to the reader and with an open licence.

Sub-goals
1 Scientific publications by corresponding WUR authors, and preferably co-authors, are available via Open Access. 92% of referenced articles by corresponding WUR author were already available via Open Access in 2021.
2 Open Access publishing in a future-proof and sustainably accessible way. This means:
   a controlling the cost of Open Access publishing, while also reducing dependency on scientific publishers wherever possible.
   b optimally reducing financial, technical, and administrative access barriers to Open Access publishing and ensuring the sustainable availability of publications included in the WUR repository.

'I support open science because I think researchers and lecturers should invest their time in developing their field, rather than having to reinvent the wheel several times.'

Dr. Yann de Mey | Associate Professor of Business Economics

3 Evaluating the quality and impact of Open Access publishing. The eventual control of quality and impact is primarily a responsibility of the scientific community.
4 Encouraging and facilitating WUR researchers in complying with the WUR Open Access policy and Open Access requirements of the government and grant-awarding organisations.

Department involved
• WUR Library

1 Open Access & Open Scholarly Communication

Programme line leader WUR Library

ACTIVITIES

Objective	2022	2023	2024	2025
1 Facilitating and Encouraging Open Access and Open Scholarly Communication	- Further development of infrastructures, services, and tools - Start extension of support to various forms of publication, with a focus on Open Access licensing	- Publication types campaign: skills for Open Access publishing and licensing - Optimisation of various infrastructures, services, and tools - Evaluation of current Open Access policy in collaboration with the Recognition & Reward project group - Start adaptation of Open Access training for PhD candidates and researchers	- Updating Open Access policy in collaboration with the Recognition & Reward project group, and start implementation of updated policy - Continue development of infrastructures, services, and tools - Implementation Open Access training for PhD candidates and researchers	- Updated Open Access policy linked to Recognition & Reward - Transfer of Open Access components to regular management organisation - PhD candidates and researchers have appropriate levels of Open Access knowledge and skills
2 Open Access publishing in a future-proof and sustainably available way.	- National Gold OA deals pilot - Explore Green Open Access opportunities, such as Rights Retention Strategy, Taverne opt-out, etc.	- Optimising Gold and Green Open Access opportunities	- Contribution to (non-profit) infrastructure/platform for securing sustainable availability of Open Access publications - Expansion of (Green) Open Access opportunities if applicable	- Open access routes and (storage) capabilities match the changing OA ecosystem
3 A WUR cost model for future-proof Open Access publishing	- Baseline assessment of decentrally and centrally funded publication costs - Start of development of Open Access publishing cost model for WUR	- Start implementation of Open Access publishing cost model	- Monitoring decentralised and central publication costs, adjusting where necessary	- Periodic OA cost monitoring and adjusting model where necessary
4 Quality and impact of Open Scholarly Communication	- Analysis of WUR publishing behaviour, quality, and impact of (Gold) Open Access publishers and journals	- Develop quality indicators for Open Access publishing, in cooperation with Recognition & Rewards working group	- Implementation of quality indicators - Periodic evaluation of the quality and impact of Open Access publications	- Periodic evaluation of the quality and impact of Open Access publications
5 Evaluation of Open Access percentages	- Basedline assessment of Open Access percentage of major publication forms (from corresponding WUR authors)	- Monitoring Open Access percentage of major publication forms - Where necessary, take group-specific actions	- Periodic monitoring and evaluation of OA percentages	- Periodic monitoring and evaluation of OA percentages

2 FAIR Data

Programme line leader Wageningen Data Competence Centre

WUR policy is that research output, such as data and software, should be easy to find and use. This ensures that all WUR research outcomes are reproducible, a core principle in legal research. WUR also aims to make it easier for researchers and research infrastructure to combine, exchange, and reuse (meta)data to stimulate innovation and exchange. This requires the use of good data management practices and generating machine-readable metadata from the outset of the research cycle. On this basis, data users can assess the fitness for purpose, quality, and access conditions of the underlying data.

The above ambitions increase the visibility and social impact of WUR data, software, models, and other research output. The FAIR principles are basic principles to ensure this impact and therefore play a central role in WUR's FAIR & Open Science ambitions.

Overarching goal
WUR is a FAIR enabling organisation, in which policies, infrastructure, and support services are in place to facilitate researchers in generating FAIR (meta)data, software, models, or other research output

Sub-goals
1 WUR has guidelines for researchers that clearly state which of the (15) FAIR principles may apply to research data, software, models, and other research objects (F and A principles) and which are project-dependent (particularly I and R principles).
2 Both existing and potentially missing policies, technical and organisational infrastructures, and support services to be a FAIR-enabling organisation have been clearly identified and where necessary (further) developed.
3 The data management and FAIR data skills of the data stewards match both the organisation's policies and ambitions.

4 Researchers are familiar with "FAIR by design" (e.g. through flagship projects) and know where to find the necessary building blocks for applying "FAIR by design" (technical infrastructure and expertise (e.g. research software engineers)).
5 Students, PhD candidates, and researchers have an appropriate level of data management and FAIR-data skills.
6 Reusing data is part of good research practice within WUR.

Departments involved
- WDCC/Library/IT/IM/DML/Science Groups (data stewards/ coordinating data stewards)

Flagship project: UNLOCK
UNLOCK is a facility-enabling study on microbial communities. It is built on 3 experimental platforms and 1 FAIR data platform.
The concept "FAIR by Design" is hardwired into its technical infrastructure, whereby a minimum requirement of metadata needs to be added before an experiment can start. Moving through the research cycle, metadata is continually enriched at every step and the generated data is described using standards.

2 FAIR Data

Programme line leader Wageningen Data Competence Centre

ACTIVITIES

Objective	2022	2023	2024	2025
1 WUR guidelines for FAIR	- Mobilise project team and brief them on WUR guidelines for FAIR - Conduct the WUR Data Monitor 2022	- Establish and communicate guidelines - Recommendations for the WUR Data Monitor 2024	- Monitoring RDM policy and implementation (WUR Data Monitor 2024) - FAIR Data indicators for Recognition & Rewards	
2 Evaluation of RDM policy, infrastructure, and support	- Evaluation of RDM policy, technical and organisational infrastructure, and support services - Development of technical infrastructure	- Complete and communicate evaluation - Alignment of Wageningen Modelling Group with current WUR policies and guidelines	- Further development of RDM policy, infrastructure, and support services	- Further development of RDM policy, infrastructure, and support services
3 Data Stewardship skills	- Training data stewards in generic RDM support - Building the data steward Community	- Training data Stewards in discipline-specific RDM support /FAIR (meta)data generation - Management of the data steward community - Evaluation of individual roles by WUR data stewards and coordinating data stewards - Exploring the role of Thematic DCCs in developing domain-specific expertise for data stewards	- Training data/model stewards in discipline-specific RDM support /FAIR (meta)data generation - Management of the data steward community - Evaluate whether the current Data Stewardship model still matches WUR's needs and ambitions	- Training data/model stewards in discipline-specific RDM support /FAIR (meta)data generation - Management of the data steward community
4 FAIR by design awareness and training	- Gathering 'Fair by design within WUR' best practices (approx. 10 flagships)	- Campaign to promote 'FAIR by Design' through flagship projects and workshops	- 'FAIR by Design' workshops	- 'FAIR by Design' workshops
5 Skills	- Develop training programme 'Tools for FAIR data' (PhD)	- Launch RDM training for researchers - Development of data skills material/ course for BSc/MSc curriculum	- Implementation of data skills in BSc/MSc	
6 Reusing data		- Good research practice campaign for data reuse - Exploration drafting guide for data reuse (incl. data quality)	- Monitor data reusek	
7 Further development of infrastructure	- DMP online - I-Rods - Yoda - Storage Finder - MDT RDM Infra (organisational infra) - RDM Table (organisational infra) - Elsevier Data Monitor pilot - WUR Metadata editor pilot	- Further development of the RDM platform (I-Rods) and tools	- Further development of the RDM platform (I-Rods) and tools	- Further development of the RDM platform (I-Rods) and tools

'My research findings are only useful if others use them. To enable others to use my results, I prepare everything based on Open Science practices.'

Yizhou Ma | Food Process Engineering PhD candidate, nominee for the 1st Open Science Lighthouse Award Wageningen

3 Citizen Science

Programme line leader Corporate Value Creation

Overarching goal

Citizen science is a way for WUR to gain public engagement and thus contribute to the ambitions of Open Science & Education (see NPOS).

Sub-goals

Putting citizen science on the map both within and outside of WUR

1 Within WUR

  a Explore current situation and gaps regarding citizen science and formulation of the ambition

  b Set up an active community of practice regarding citizen science

  c Explicitly state which skills are needed for working with citizen science for PhD candidates, students, and WUR researchers. Part of this is to actively promote the MOOC Transformative Citizen Science for Sustainability and keep it up to date

  d d Develop output and output indicators for public engagement (including in collaboration with Recognition & Rewards working group).

2 *Outside of WUR*

  a Webportal for show-and-tell and to invite public for co-creation (both showcase and assistance desk)

  b Outreach: creating and showing social impact

  c Dialogue with citizens and civil initiatives

Activities 2022-2025

All activities below contribute to the visibility of citizen science inside and outside of WUR. Together with the researchers and ESA, CVC also wants to further strengthen the knowledge on citizen science as a methodology, building onto the MOOC. In the medium term, the visibility and knowledge leads to more and targeted use of citizen science within WUR as a way to conduct research in order to achieve closer collaboration between WUR and citizens (initiatives).

1 Shaping a community around citizen science.
Support and connect WUR colleagues with questions and ideas on citizen science. CVC's role is to establish connections within WUR and with external partners.

ACTIVITIES

Objective	2022	2023	2024	2025
1 Community participation (visibility)	- Launch portal #CS projects #Participants	- Well-functioning assistance desk for Outreach and dialogue events		
2 Strengthen skills and use citizen science	- Introduction of citizen science community of practice - MOOC launch - Using MOOC components in education	- Managing portal and MOOC - Develop national collaboration of WUR researchers involved in CS-CoP		- Update on the CS MOOC

3 Citizen Science

Programme line leader Corporate Value Creation

Methodological support is provided by scientists, such as Arjen
Wals. Supporting the MOOC on citizen science is an ESA task.

1 Gathering insight into WUR's involvement in citizen science
2 Inviting citizens to co-create with WUR
3 Show and tell (via web portal)
4 Look for funds for citizen science projects (possibly in
   collaboration with NPOS and UFW)

Departments involved

- Corporate Value Creation
- Education & Student Affairs

Flagship Citizen Science – BigO Obesity
Childhood obesity is an emerging health problem, with major
social consequences. The aim of BigO was to use Citizen
Science to collect and analyse big data on the health-related
behaviour of children and their environment in order to
identify local risk factors affecting childhood obesity. The BigO
platform has proven to operate robustly: in more than 30
months, the system was up and running 24/7, supporting
large-scale data collection in schools and clinics. link

**Flagship of Citizen Science - Digital inspiration map for
making Amsterdam neighbourhood greener**
Together with stakeholders including citizens, suitable location
to bring greenery into were sought. By combining local
knowledge with the Global Detector model, promising locations
were identified and the model was improved. link

4 Open Education

Programme line leader Education & Student Affairs

Open Education is a broad term that can include all kinds of educational developments that go beyond the institutional boundary:

- **Open Educational Resources:** 'learning, teaching, and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, reuse, repurpose, adaptation, and redistribution by others' (UNESCO definition).
  A component of Open Educational Resources is:
  – **Open Textbooks:** a dynamic publication in which advantage can be gained through the use of various media. Click here for an example of an open textbook with contribution of WUR author Nico van den Brink.
- **Open Pedagogy** concerns didactic working methods with Open Educational Resources in which the student is central (e.g. see this themed issue).

Our goal for WUR is to define the scope for Open Education by 2025: which parts do we want to focus on, and what is our ambition in each of those sub-areas of Open Education?

WUR has already started shaping the Open Educational Resources sub-area. There is a plan for a phased implementation from 'open within WUR' to 'semi-open' to 'open' in 2025; facilitation, support, and frameworks for this are partly in place and will be extended or adapted as necessary. Proper implementation requires refining the vision of Open Educational Resources: from quantity to quality. The aim is not to share all educational resources, but to open up precisely those materials that contribute to educational quality. Our MOOCs and Green Knowledge Network are good examples of this.

ACTIVITIES

Objective	2022	2023	2024	2025
1 Open Education: scope and ambition: - promoting and facilitating developments regarding Open Textbooks - Facilitating cross-institutional professional communities	[a] Exploring the Open Textbooks subtopic: - launch of national survey - inventory of costs and use of prescribed literature/textbooks	[a] reporting inventory [b] setting up pilots on subject communities (e.g. the exact sciences community) and Open Textbooks	evaluate [a] en [b]	Open Education has a place in: - new educational vision - Recognition & Reward
2 Open Educational Resources: focus	- MOOCs - Groen Kennisnet - Proposed policy change: from quantity to quality	- Adopting improved WUR policy - Adjusting WUR guidelines	Evaluate pilots and adjust policy if necessary	Open Educational Resources has a place in BKO
3 Support phased implementation of Open Educational Resources	[a] skills leerlijnen in Library for Learning [b] Boundary Crossing in Edusources professional	[c] EWUU subject community pilot	Setting up educational staff professionalisation regarding Open Educational Resources	- Open Educational Practices have a place in the course offering for teachers and/or BKO - Support is in place

4 Open Education

Programme line leader Education & Student Affairs

Objectives:

1 F.A.O Open Education more broadly: defining scope and ambition
2 Bringing focus to the WUR vision of Open Educational Resources
3 Continue to support ongoing phased implementation of Open Educational Resources.

Departments involved

- Education & Student Affairs
- WUR Library

Flagship MOOC Circular Fashion

The MOOC Circular Fashion: Design, Science and Value in a Sustainable Clothing Industry brings you a comprehensive introduction to circular fashion by roughly 30 different experts from both academia and practice. You will learn about the versatile task of transitioning towards circular fashion, from the unique collaboration between Wageningen University & Research, ArtEZ University of the Arts, and many other experts here.

Flagship Sharing education materials

Library for Learning (L4L) is the WUR portal for searching and finding learning tools created by WUR lecturers. The portal contains hundreds of WUR teaching materials, including videos, e-modules, audio clips, and infographics. These learning tools are free to use in WUR education. Through Edusources, the national platform for digital open educational resources of Dutch higher education, WUR materials can now also be made publicly available in a secure and reliable way.

Conditions for the transition to Open Science and Open Education

Policy & intellectual property law
It is crucial that WUR administrators and management of sciences groups communicate their commitment to Open Science by promoting Open Science principles and practices through policy, implementation, dedicated funding, and support.
At WU, we pursue the ambition as formulated by the Universities of the Netherlands (UNL); an appropriate Open Science ambition will be formulated for WR. In order to share and reuse research output, policies on intellectual property rights and academic and digital sovereignty are essential ("open as early as possible and protected when necessary").

Engagement, Support & Training
To transition to an open academic culture within WUR, it is important to create awareness and encourage and support a vibrant Open Science Community of academics and support staff. Researchers, lecturers, and students should be equipped with skills and knowledge they need to apply OSE principles in their daily work.

Infrastructure
Researchers and lecturers should be facilitated to make their research and learning materials open and FAIR (Findable, Accessible, Interoperable, and Reusable). This requires a technical, organisational, and service infrastructure — where possible — in collaboration with other universities, national, and international partners (e.g. the European Open Science Cloud or EOSC). This also calls for further operationalisation of FAIR principles in which WUR focuses on certain aspects.

Monitoring; Recognition & Rewards
To enable the transition to Open Science and Education, assessment systems need to be adapted to align with Open Science values and practices. With regard to research in groups, these are already part of the Strategy Evaluation Protocol (SEP); with regard to individuals, this task is assigned to the Recognition & Rewards working group. Coordination between the OSE programme and this working group is crucial to the success of the transition to Open Science. OSE principles should also be included in WUR and LNV-funded research (KB, BO, Top Sectors, WOT, and Investment Themes).

Partnership with other organisations
To align Open Science and Open Education visions, activities, and instruments nationally and internationally and implement them effectively, it is important to work with others. WUR is part of the partnerships of Universities of the Netherlands (UNL) various UKB and SURF project groups LCRDM, ETUU alliance, etc.

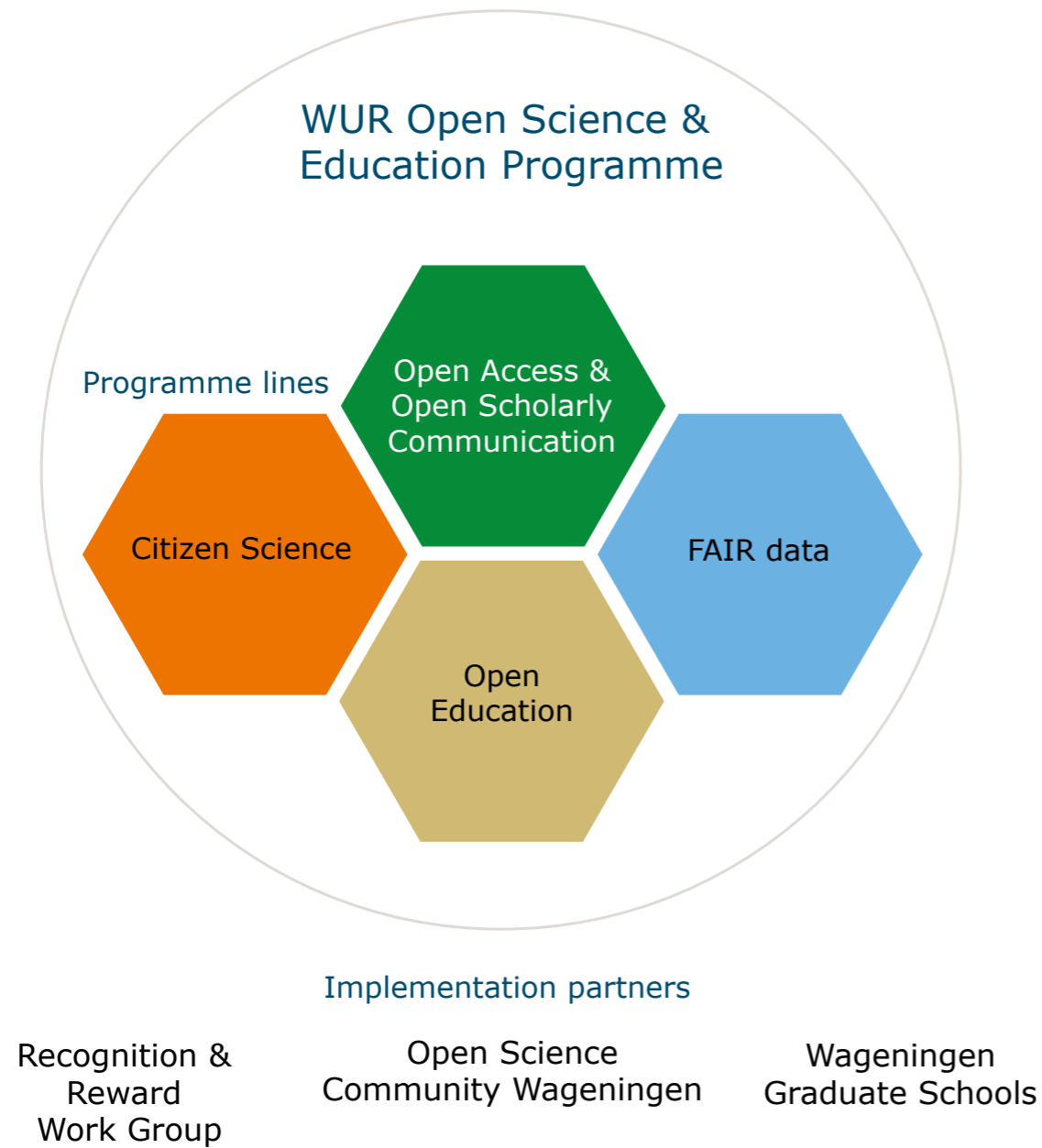**Distinction between Wageningen University and Wageningen Research**
The idea behind Open Science is that publicly funded research should be freely accessible. For Wageningen Research, the situation is more nuanced and other, particularly commercial, considerations sometimes come into play. Where appropriate, separate programmes will be developed for WU and WR research and education.

'I believe Open Science helps change research cultures for the better'

Annika Tensi | Open Science Founder Wageningen Community

Governance

WUR Open Science &
Education Programme

Programme lines

Citizen Science

Open Access &
Open Scholarly
Communication

FAIR data

Open
Education

Implementation partners

Recognition &
Reward
Work Group

Open Science
Community Wageningen

Wageningen
Graduate Schools

Steering committee
A steering committee chaired by WUR
Rector Magnificus and represented by WU
and WR officials directs the programme.

Programme management
Programme management is assigned to
Corporate Strategy & Accounts. A
programme manager monitors overall
progress and reports to the steering
committee. This connects participants and
practitioners from different programme
lines in the OSE **Taskforce.** A programme
manager represents WUR as Chief of Open
Science within UNL and NPOS.

Policy, Awareness & Skills

Programme line leader Corporate Strategy & Accounts (CSA) \ programme manager

Overarching goal

Increase impact of WUR research and education by making Open Science & Education the standard practice in WUR research and education and implementing it in all layers of the WUR community.

Sub-goals

1 Align WUR OSE policy with developments in national and international policy.
2 Include OSE in the WU and WR system of Recognition & Reward.
3 WUR students and researchers have Open Science and Education skills at their disposal.
4 WUR research products are widely shared with society and optimally reused.
5 Integration of the OSE programme lines.

Departments involved

- Corporate Strategy & Accounts
- WUR Library
- Wageningen Graduate Schools
- Education & Student Affairs and the Board of Education
- Corporate Governance & Legal Services
- Communication Services
- Wageningen Community Open Science
- Recognition & Rewards working group
- WUR Board of Directors

‘As researchers, we stand on the shoulders of giants. I believe Open Science can help us reach even greater heights.’

Julia Höhler | Assistant Professor Business Economicse

OSE implementation in KB and Investment Theme projects

Several days of Open Science webinars and training were provided in 2020 and 2021 for about 125 researchers of the KB theme "Circular and Climate Neutral" and the Investment theme "Connected Circularity". The trainings focused on "Visibility for scientific impact" and "Engagement for societal impact" and were well appreciated. The lessons learnt were implemented through a valorisation plan developed by the OSE programme.

Policy, Awareness & Skills

Programme line leader Corporate Strategy & Accounts (CSA) \ programmamanager

ACTIVITIES

Objective	2022	2023	2024	2025
1 Policy and IP rights	- Generic principles for Recognition & Reward OSE - Update WUR policy on IP rights and academic and digital sovereignty	- OSE principles have been translated into WR - OSE has been ensured in WUR pro-grammes KB, BO, the top sectors, WOT, and investment themes - E&W plan for WU and WR has been final-ised - WUR board and general directors actively encourage the application of OSE principles		- OSE principles are applied at both WU and WR and embedded into both programmes and individual career paths as part of practising "sound science"
2 Engagement & training	- Slightly expand existing OA and RDM training courses for PhD candidates (limited scope) or adapt them to new OSE develop-ments - Start developing scenarios (ambitions and costs) for an OSE skills programme with broader reach (OA, RDM, and OE) for PhD students, senior researchers, lecturers, and students. Components include: a Determining desired OSE competence level b Assessment of existing OSE training programmes c Start identifying competences and existing training programmes (OA, RDM, and OE) and develop future scenarios (ambition, cost, E & W) d Start further development of OSE skills for WUR-wide — KB etc. — programmes e BSc/MSc: Explore the option of a short module in Academic Skills that includes OSE elements - OSE Communication plan for engaging WUR staff - Start Wageningen Community Open Science	- Detailing the OSE skills programme for PhD candidates - Board of Education examines the extent to which OSE skills should be embedded into BSc and MSc education (incl. level of ambition and timeframe) - Skills training for researchers from KB and BO programmes - OSC-W community support: ongoing	- Skills training for researchers from BO, the top Sectors, and WOT programmes - Plan for expanded training-programme and workshop offerings for all WUR researchers - Implementation of the OSE skills programme for PhD candidates	- OSE skills have been addressed in the development of the educational vision - Expanded OSE training-programme and workshop offerings for students and researchers
3 Programme management	- Specifying the 2022-2025 programme - Development of monitoring and OSE KPIs - Contribute to national collaboration through Chief of Open Science role (ongoing)			