Research Assessment Exercise 2024 Report

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Åbo Akademi University

RESEARCH ASSESSMENT EXERCISE 2024 REPORT

Evaluation of the research environments within the four Strategic Research Profiles of Åbo Akademi University

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2024

Research Assessment Exercise 2024 Report

Evaluation of the research environments within the four Strategic Research Profiles of Åbo Akademi University

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Abbreviations

CoE	Center of Excellence
CRC	IT Center for Science Ltd
ERC	European Research Council
EU	European Union
FHPT	Faculty of Arts, Psychology and Theology
HRS4R	Human Resources Strategy for Researchers
FPV	Faculty of Education and Welfare Studies
FNT	Faculty of Science and Engineering
FSEJ	Faculty of Social Sciences, Business and Economics, and Law
FTE	Full-time equivalents
JUFO	Julkaisufoorumi (Finnish national journal metrics)
PI	Principal investigator
RCF	Research Council of Finland
BF	Business Finland
SfH	Solutions for Health strategic research profile
SG	Steering group
SRP	Strategic research profile
TSF	Technologies for a Sustainable Future
UTU	University of Turku
ÅAU	Åbo Akademi University

Foreword by the Vice-Rector for Research of ÅAU

In its December 2023 meeting, as a strategic development tool, the Åbo Akademi University Board initiated a Research Assessment Exercise to be conducted during the following year. Such assessment is also part of the university's commitments to the Ministry of Education and Culture in Finland. During the spring of 2024, the Strategic Research Council of the University further discussed and refined the research assessment task, deciding on focusing the evaluation on the four strategic research profiles of Åbo Akademi during 2016–2023. Together with this assessment, also a thorough analysis of scientific publications across all the research areas and disciplines of the university would be performed.

According to the recently approved Åbo Akademi University Strategy 2030, the current interdisciplinary research profiles of the university, for meeting global sustainability challenges faced by all humanity, remain as *Minority Research*, *The Sea*, *Solutions for Health* (earlier *Drug Development and Diagnostics*), and *Technologies for a Sustainable Future*. These profiles naturally extend beyond the faculty boundaries, functioning as dynamic, albeit not exclusive, platforms for a significant part of our key research activities and infrastructures, aimed at generating substantial scientific as well as social impact.

Research assessment serves as an important instrument in further development of both the resources and the future research directions. I am sincerely grateful to and proud of all our researchers, research leaders, doctoral students, post-doctoral fellows, professors and supporting personnel who offered their precious time for the exercise, both during the self-evaluation phase, as well as during the site visit by the Nordic expert panel, taking part in interviews and providing essential material for the evaluation.

My sincerest thanks go also to our superb and highly professional assessment panel, led by Professor Per Mickwitz, Pro Vice-Chancellor of Lund University, together with Professor Inger Furseth, University of Oslo, Professor Emeritus Anders Hallberg, University of Uppsala, Professor Annica Sandström, Luleå University of Technology, and Professor Monika Österberg, Aalto University, for their dedicated work, constructive and critical feedback, their advice and

encouragement. Åbo Akademi deeply appreciates your external perspective on our research activities. Thank you all!

Finally, I wish to thank the Rector of Åbo Akademi, my Vice-Rector colleagues and the Deans of the faculties for their contributions and support, and especially Dr. Mats Lindfelt and his whole team at the Research Services for organizing all practical work and details for the assessment panel, before, during and after the site visit. In particular, I warmly thank Dr. Maija Mustaniemi-Laakso and Dr. Thomas Nyholm for assisting the panel and for editing the final report, and Kimmo Borg for his dedicated work on the bibliometric analysis. In addition, I want to thank Charlotta Acquah and Jennifer Penttinen for their dedicated work on the data collection for the assessment.

Wishing you all the best of luck with all your future efforts, may your research and academic freedom prosper.

Reko Leino
Vice-Rector

1 Åbo Akademi University in Brief

1.1 About Åbo Akademi University

Åbo Akademi University (ÅAU) is the Swedish-language multidisciplinary academic university in Finland, with **campuses** in Turku and Vaasa. It contributes to society through general learning, education and new scientific knowledge. The university was founded in 1918 and is today composed of **four faculties**: Faculty of Arts, Psychology and Theology (FHPT); Faculty of Education and Welfare Studies (FPV); Faculty of Science and Engineering (FNT), and Faculty of Social Sciences, Business and Economics, and Law (FSEJ).

ÅAU has some 1200 employees, out of which 700 in teaching and research, 5200 undergraduate and 800 postgraduate students, and an annual turnover of EUR 115 million (Figure 1.1.). Every tenth employee has an international background.

The **Åbo Akademi University Board** is the university's highest decision-making body. The Board consists of ten members. Six of them represent the university, and four are external members. ÅAU's **Rector** is responsible for the implementation of the Board's decisions. The Rector's other duties include heading the university's daily operations as well as deciding on matters related to the university, its finances and its personnel. The Rector is assisted by three Vice Rectors, who are responsible for Educational Affairs, Research Affairs, and Collaboration, respectively. The university also has a Rector in Vaasa, who is the chair for the Delegation for ÅAU in Vaasa.

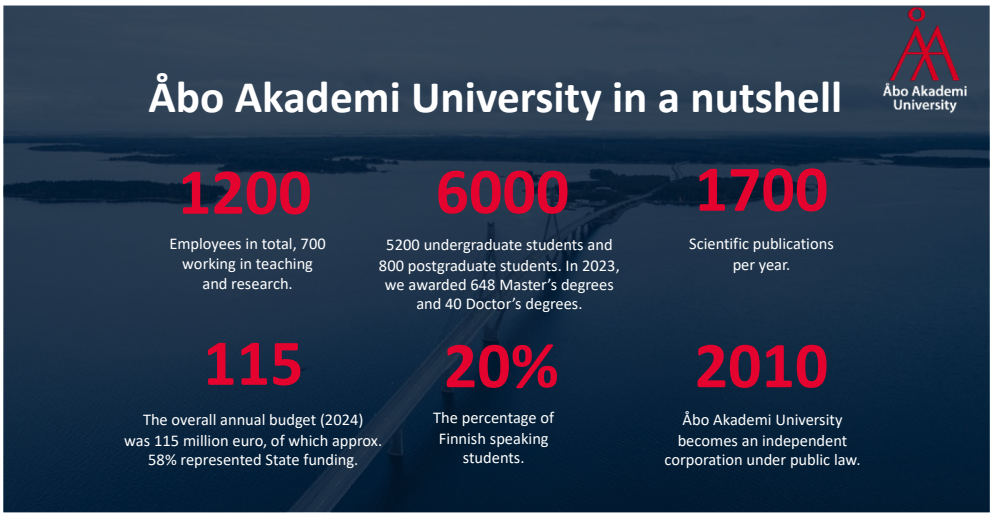

Figure 1.1. Key figures of Åbo Akademi University 2024.

ÅAU's strategy is the key guiding document for the university, created by the Board in collaboration with students and staff to shape the university's future. It is a living roadmap to be used, adapted and further developed, based on which the ÅAU management, faculties and departments set goals and draft action plans. The current strategy for the years 2025–2030 was published in October 2024 and sets ambitious targets in several basic areas of activity, such as research, education, multilingualism and international cooperation, sustainability and social responsibility. Among the nine concrete goals, the strategy sets as an objective for ÅAU to have by 2030 at least two externally recognised centres of excellence in research and to increase external competitive research funding by 25% from the 2023 level. A newly adopted Roadmap for the University Organisation 2025–2030 further specifies the strategic choices and focus areas set forth in the new strategy (Figure 1.2).

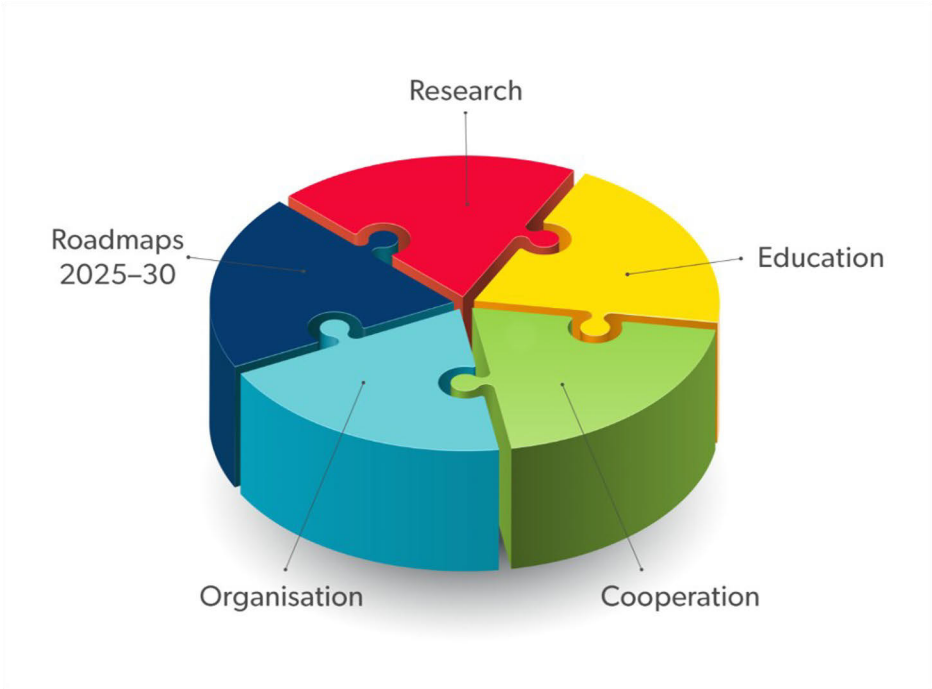

Figure 1.2. Strategic focus areas 2025–2030.

The **mission** for 2030 set forth by the new strategy is for ÅAU to contribute to both present and future society through education and research, with a particular responsibility towards the Swedish-speaking community in Finland. As its core **values**, the university emphasises knowledge, community, enabling, and sustainability (Figure 1.3.). ÅAU aims to provide a non-discriminatory, equal, anti-racist and accessible work environment where both students and employees from different backgrounds are treated fairly and feel that they can safely participate in all activities.

ÅAU was awarded the **HR Excellence in Research Award** in 2020 and in 2023 it passed the interim assessment in the implementation phase in the Human Resources Strategy for Researchers (HRS4R) process. HRS4R is a tool of the European Commission to help institutions of higher education and research develop their activities in line with the principles in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers (Charter & Code). By implementing the Charter & Code, ÅAU aims at developing and maintaining a stimulating working environment for researchers to ensure

motivated, highly qualified and skilled human resources in research and innovation.

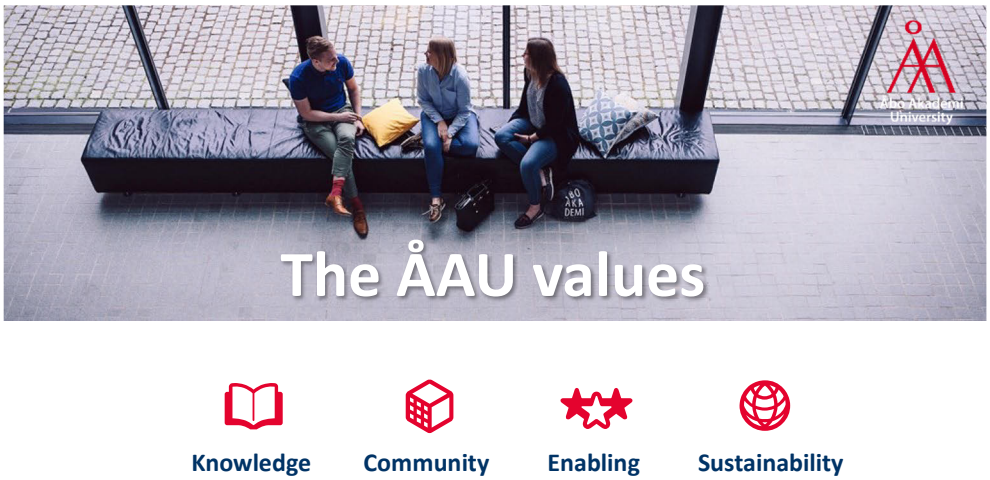

Figure 1.3. ÅAU values 2025–2030.

ÅAU is a member of the **European University Alliance** CHARM-EU composed of the University of Barcelona (coordinator), Trinity College Dublin, Utrecht University, the University of Montpellier, Eötvös Loránd University Budapest, ÅAU, Julius-Maximilians-University Würzburg, Ruhr West University of Applied Sciences and the University of Bergen. European University Alliances are an initiative of the European Commission to contribute to the creation of an attractive and competitive European Education Area. Membership in CHARM-EU creates opportunities for students, researchers, teaching staff and administrative staff to network, exchange and develop skills with colleagues at other member universities. Participating in the alliance's activities also provides opportunities to find relevant partners for joint project applications.

1.2 Research at Åbo Akademi University

ÅAU plays a significant role in international research and education for a healthy and sustainable living environment, especially in the common region around the Baltic Sea, and conducts research and education for an inclusive and open society. The research contributes to solving the challenges of the world around us and achieving the United Nation's Sustainable Development Goals.

With the support from the ÅAU Foundation, ÅAU has appointed **Centres of Excellence** (CoEs) in research since 2006. The CoE programme supports research at ÅAU with the aim of achieving the highest possible quality and impact. The strategic investment in the CoE programme will also support researchers and research teams to become competitive in the contest for funding from the most competitive funding sources. Currently (2024–2028), the following four CoEs are in operation: Psych-AID: Psychology at the Frontiers: Asylum Interviewing and Decision-Making; RELEX: Religion and Social Exclusion: A Cross-Cultural Approach and New Methodology; MADNESS: Materials-Driven Solutions for Combatting Antimicrobial Resistance; SOS: Centre for Sustainable Ocean Science. In addition to the CoEs, ÅAU includes fifteen **research institutes**.

ÅAU focuses its research on **four Strategic Research Profiles (SRPs):**

Technologies for a Sustainable Future (previously, Molecular Process and Material Technology), focusing on chemical engineering and material aspects in the bioeconomy.

Solutions for Health (previously, Drug Development and Diagnostics), focusing on bioimaging, functional materials, health economics, IT in health and targeted therapies and diagnostics.

Minority Research, interdisciplinary research on the complexities involved in the production and construction of minority positions, identities, and rights.

The Sea, towards a living lab for marine and maritime research – society, nature, and technology.

Figure 1.4. ÅAU strategic research profiles.

These four strategic research themes direct ÅAU towards a set of pathways that provides for aspirations and inspire actions towards important contributions to societal issues.

The **employment structure** for researchers and teachers at ÅAU consists of four career stages: stage 1 (the level of postgraduate education), stage 2 (postdoctoral researcher, project researcher, associate professor and university lecturer); stage 3 (university researcher, senior researcher, head of research, research leader and senior university lecturer); and stage 4 (professor, visiting professor, professor of practice). In 2023, 170 employees were at stage 1, 261 at stage 2, 109 at stage 3 and 82 at stage 4 (Table 1.1.).

Table 1.1. The number of researchers at ÅAU according to career stage 2016–2023.[1]

Employment stage	2016	2017	2018	2019	2020	2021	2022	2023
Stage 1	146	142	145	141	155	134	133	170
Stage 2	208	242	256	250	252	241	254	261
Stage 3	100	88	94	101	104	108	107	109
Stage 4	109	93	85	83	81	83	86	82

During 2016–2023, the numbers of academic staff employed at career stages 1-4 within the four SRPs were as follows (Table 1.2.):

Table 1.2. The number of academic staff at various career stages in the SRPs 2016–2023.

Strategic Research Profile	Stage 1	Stage 2	Stage 3	Stage 4
Minority	14	15	21	18
SfH	138	81	76	32
TSF	113	81	48	49
Sea	11	14	7	15

[1] Data obtained from www.vipunen.fi (educational statistics supplied by the Ministry of Culture and Education and the Finnish National Agency for Education).

The **tenure track career system** is used at ÅAU to complement the four-level employment structure for research and teaching staff. Recruitments within the tenure track-system are open and internationally oriented. A tenure track position offers the recruited individual an opportunity for permanent employment and career advancement up to a professorship within the scientific discipline in question. The person to be hired may, depending on his or her experience and competence, be positioned on any of the three tenure track levels: assistant professor (stage 2), associate professor (stage 3), or professor.

Doctoral studies at ÅAU are organised in the form of doctoral programmes. A faculty may have several doctoral programmes, and a single doctoral programme can have one or more major subjects. Together, the doctoral programmes comprise the Graduate School at ÅAU. As part of an initiative of The Ministry of Education and Culture granting funding in a national pilot initiative aimed at increasing the number of graduated doctors in Finland over the next six years, ÅAU has been granted funds which will open three-year positions for a total of 26 doctoral researchers. The total number of doctoral examinations at ÅAU ranges between 41 and 73 in the period 2016–2023 (Table 1.3.).

Table 1.3. The number of doctoral degrees awarded at ÅAU 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023	Total
FHPT	11	18	17	16	11	17	15	7	112
FNT	38	32	30	20	24	26	18	18	206
FPV	14	12	9	12	9	15	13	11	95
FSEJ	10	6	6	9	4	8	7	5	55
ÅAU total	**73**	**68**	**62**	**57**	**48**	**66**	**53**	**41**	**468**

1.3 Research funding

The share of competitive/non-competitive and national/international **research funding received by ÅAU over 2016–2023** is illustrated below (Figure 1.3.). As per the goals set in its new Strategy 2025–2030, the university strives for a 25% increase in competitive external research funding from the 2023 level by 2030. To compete for such funding, the strategy sets forth that all areas of activity must be well-developed: recruitment of the right people, time for research, necessary infrastructure for research and a highly competent support organisation. The work towards this goal is guided by the Roadmap for the University Organisation 2025–2030. A recently expanded External Research Funding team at ÅAU Research Services supports the ÅAU researchers in applying for and managing

external research funding, with a focus on European Union (EU) Horizon Europe, Research Council of Finland and Business Finland funding. The team is currently composed of four grant writers / research specialists, a post-award specialist, an innovation specialist, a research coordinator, a controller and a project leader.

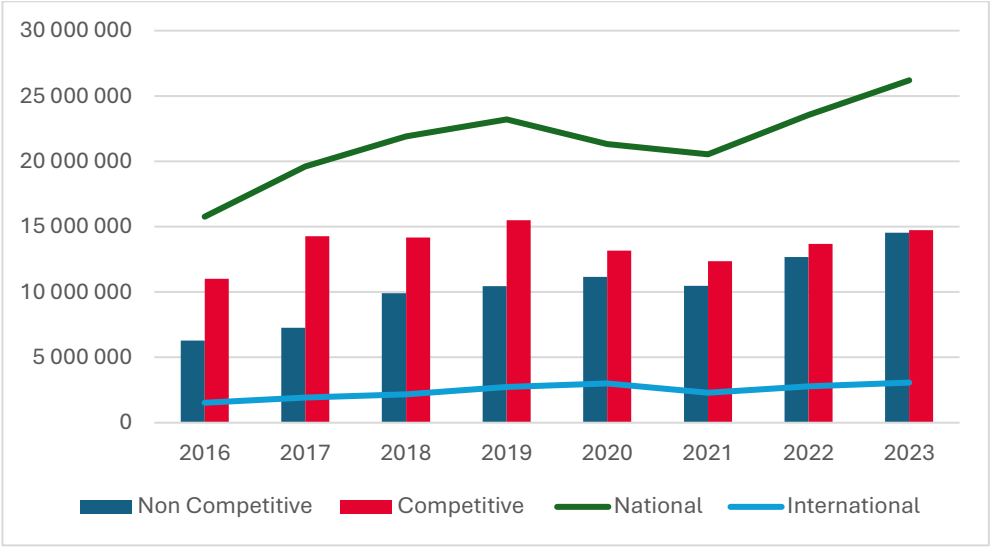

Figure 1.3. The external funding received by ÅAU 2016–2023.[2] [3]

[2] The data on ÅAU total external funding, including funding for both research and research education, is extracted from data reported by the ÅAU to the Ministry of Culture and Education. The table for ÅAU total external funding divided into competitive vs non-competitive and national vs international funding draws on numbers from the financial system SAP. As older projects are archived in the system, the numbers differ slightly but indicate the proportions and the trends in the development of the funding.

[3] Competitive funding refers (in line with the definition by the Ministry of Education and Culture) to EU framework programme and other competitive EU funding; funding from international foundations; funding from international organisations; other international funding; Research Council of Finland funding; Business Finland funding; and funding from companies. Non-competitive funding refers to funding that is not defined as competitive funding, that is, funding from most domestic foundations, ministries, municipalities, EU's Erasmus programme and other EU research funding not belonging to the EU framework programmes.

The share of the **total amount of ÅAU competitive and non-competitive research funding** over the year 2016–2023 and the share **received by the SRPs** is illustrated below (Table 1.4).

Table 1.4. External funding shown as millions of euros received by ÅAU and the SRPs 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023	Total
Minority	1.03	1.31	2.09	2.46	2.48	2.53	3.31	4.39	19.59
The Sea		1.43	0.84	0.86	0.87	0.78	0.97	1.07	7.92
SfH	3.02	3.77	4.27	4.85	5.21	5.83	6.01	5.93	38.89
TSF	3.60	3.74	3.81	4.15	4.36	4.43	4.89	6.83	35.81
ÅAU Total	**21.4**	**22.6**	**24.6**	**28.0**	**24.8**	**23.5**	**26.7**	**29.6**	**201.2**

The annular overall **success rate of ÅAU in applications to the Research Council of Finland** (RCF) is shown below (Table 1.5.). In RCF project applications, the average success rate during the last four years has been 12% (for more details see, Annex 1)

Table 1.5. The overall ÅAU success rate in applications to the Research Council of Finland 2016–2023.[4]

Year	Number of applications	Applied funding	Number funded	Funding	Success rate	
					Quantity	Amount
2016	168	83 391 529	36	16 459 808	21 %	20 %
2017	125	63 114 824	15	9 429 897	12 %	15 %
2018	109	45 474 453	27	10 269 904	25 %	23 %
2019	128	49 021 596	21	4 864 074	16 %	10 %
2020	161	97 258 644	21	16 798 800	13 %	17 %
2021	120	53 830 770	25	8 044 533	21 %	15 %
2022	95	53 163 999	18	5 699 168	19 %	11 %
2023	29	12 999 281	13	5 859 731	45 %	45 %
Total	**935**	**458 255 096**	**176**	**77 425 915**	**19 %**	**17 %**

As regards the university's **core funding**, the Ministry of Education and Culture distributes core funding to the universities in Finland based on the percentage units assigned to different indicators related to education and research. Internally, within the ÅAU, the support units, such as the ÅAU library and the University Services, receive their share of this core funding. The rest of the core funding is distributed to the faculties according to the percentages of the

[4] The data is collected from ÅAU databases on a yearly basis, which means that the submission of applications and the generated funding may fall on different years in the table. The low number of submitted applications 2023 is related to the fact that the RCF Autumn Call was moved from September to January the following year (Winter Call).

universities' core funding model, that is 42% allocated to education, 34% to research and 24% to other education and science policy considerations.

1.4 Publications

The numbers of ÅAU scientific publications over 2016–2023 are presented below by Finnish national journal metric (JUFO) category 1-3 (Table 1.6.), by open access status (Table 1.7.) and by international/national status (Table 1.8.).[5] [6]

Table 1.6. The number of ÅAU scientific publications (A-C) by JUFO category 1-3 2016–2023.

JUFO	2016	2017	2018	2019	2020	2021	2022	2023
3	69	114	99	102	134	116	117	173
2	232	328	251	284	279	273	252	275
1	529	639	606	710	776	735	610	502
Total	**830**	**1081**	**956**	**1096**	**1189**	**1124**	**979**	**950**

Table 1.7. The share of ÅAU publications by access type (open/closed) 2016–2023. Open access includes gold, hybrid and self-archived articles.

	2016	2017	2018	2019	2020	2021	2022	2023
Open	370	521	628	859	1063	979	995	995
Closed	863	806	622	436	315	297	223	256
Total	**1233**	**1327**	**1250**	**1295**	**1378**	**1276**	**1218**	**1251**

[5] The publication dataset was exported from the ÅAU research information system AboCRIS launched in 2020 (https://www.abo.fi/en/research-at-aau/research-information-system/) and includes all validated and public records with internal ÅAU affiliation. The dataset includes publications published 2016–2023. All the metadata in the dataset is registered directly into the research information system except the data on the Finnish national journal metric (JUFO). The JUFO categories were extracted from the Ministry of Culture and Education publication data warehouse. The JUFO value used in the dataset is the value that the ministry uses in allocating funding to Finnish universities. Minor differences were found when comparing the JUFO statistics to what is yearly reported to the ministry. There are several reasons for this. One is the fact that approximately 5% of publications are reported late and can thus have been allocated to different years in the current dataset and in the annual reporting. In cross-checking the data some discrepancies were also found in the data source provided by IT Center for Science Ltd (CSC) that supplies the publication data warehouse to the Ministry of Culture and Education. ÅAU has reported the findings to CSC but has not received a response by this date. The error margin due to these differences/discrepancies is estimated to be below 2%.

[6] For more details, see Annex 2.

Table 1.8. The share of international co-publications 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
Yes	42%	39%	43%	47%	47%	47%	50%	45%
No	58%	61%	57%	53%	53%	53%	50%	55%
Publications	**1232**	**1327**	**1246**	**1290**	**1378**	**1276**	**1218**	**1250**

2 Assessment goals, materials, methods and process

2.1 Assessment goals

The aim of the Research Assessment Exercise 2024 was to assess the impact of the SRP activities, the development of research excellence, and the contribution that the selected profiling measures have had on the development of interdisciplinary research within the SRPs and within ÅAU over the years 2016–2023. The evaluation included a bibliometric analysis of the research publications of the four faculties of the university.[7] Background material was developed for this purpose to assist in developing an internal taxonomic classification of the research groups and environments based on transparent and open criteria such as the level of external funding, high quality publications, success in researcher training, international networking, and social and scientific impact.

The assessment was carried out in relation to the ÅAU strategy 2015–2020, strategy 2021–2030, and, in particular, the newly updated and approved strategy 2024-2030 (ÅAU Board, August 2024). The current strategy emphasizes the importance of the development of competitive external research funding and sets as an objective that ÅAU shall have at least two externally recognized excellent research environments in research by the end of the present strategy period.

The assessment responded, inter alia, to the following questions:

- How have academic activities within the SRPs developed since 2016?
- How has the research within the SRPs contributed to the creation of excellent research environments in each research profile and which areas within the SRPs can develop towards excellence, including through the utilisation of the results?
- What are the levels and trends of external funding for research within the SRPs?

[7] Bibliometric report of ÅAU 2016–2022/23 prepared by Leiden University (unpublished, copy in possession of ÅAU Research Services).

- What is the impact in terms of dissemination within the SRPs?
- How are the SRPs interacting with society?
- What is the number of doctoral candidates/postdoctoral researchers/senior researchers within the SRPs?
- Which research areas are included in each SRP? Have they been designed as inclusive or exclusive environments? Which exclusions have been made?
- How has the profiling contributed to the renewal of science and to academic growth in the respective fields?
- What are the strengths and weaknesses of each SRP and what is their potential for development?

The research environments were compared with similar activities carried out at other higher education institutions in Finland. The material used in the assessment was extracted by the ÅAU Research Services from, among others, the national vipunen.fi database and the Research Council of Finland's reports on the State of Scientific Research in Finland. The sources referred to are mentioned in the text or in footnotes.

2.2 Main phases of the Research Assessment Exercise

Based on preparation by the ÅAU Strategic Council for Research in the spring of 2024, the Research Assessment Exercise was planned, and the external expert panel selected in June 2024. Data for the evaluation was subsequently collected by the ÅAU research services, and a bibliometric report of ÅAU publications was ordered from Leiden University.

During the period 15 September – 15 October 2024, the SRP steering groups were asked to perform a self-evaluation, in which they reported on, and evaluated the progress of the SRPs from 2016 to 2023. The self-evaluation data was collected through a Microsoft Forms questionnaire (Annex 3). ÅAU Research Services supplied data for the self-evaluation by the SRPs. The self-evaluation reports submitted by the SRP leaders and the data collected by the ÅAU research services were handed over to the external expert panel on 6 November 2024.

During the external expert panel review visit in Åbo 20 – 22 November 2024, the panel interviewed the ÅAU rectorate, the deans of the four ÅAU faculties, SRP

steering groups and selected SRP members (for the programme of the site visit of the panel, see, Annex 4). Based on the supplied information, the self-evaluations and the interviews, the panel was tasked with evaluating the SRPs and making suggestions for improving their performance to support the University strategy 2024–2030.

The external expert panel (Figure 2.1.) was composed of the following experts:

Per Mickwitz (Chair), Professor of Environmental Policy and currently Pro vice-chancellor at Lund University

Anders Hallberg, Professor Emeritus of Medicinal Chemistry at Uppsala University

Monika Österberg, Professor of Bioproducts Chemistry at Aalto University

Inger Furseth, Professor of Sociology and Human Geography at Oslo University

Annica Sandström, Professor of Political Science at Luleå University of Technology

ÅAU Research Services contributed to the evaluation report by supplying data for the report, taking notes during the interviews and assisting in drafting the descriptive parts of the report concerning the university at large. The research assessment working group at ÅAU was composed of **Charlotta Acquah**, Research Coordinator; **Jennifer Penttinen**, Controller; **Kimmo Borg**, Project Leader; **Maija Mustaniemi-Laakso**, Research Specialist; **Mats Lindfelt**, Director of Research Services; and **Thomas Nyholm**, Research Specialist.

Figure 2.1. The external expert panel during the visit in Åbo. From the left, Anders Hallberg, Monika Österberg, Inger Furseth, Annica Sandström and Per Mickwitz. (Photo by Pamela Friström).

3 Minority Research

3.1 Participants

Minority research counts a great number of ÅAU researchers, scholarly communities and infrastructures across three faculties. Key personnel of the profile includes six steering group members and three tenure track professors (two were tenured in 2020), complemented by postdoctoral researchers and doctoral researchers hired specially to strengthen the profile. During the period 2016–2023, the SRP has included a total of 36 senior researchers, 15 postdoctoral researchers, 14 PhD students, 28 principal investigators (PIs), and 47 docents. In 2023, there were 3 tenure track professors, 3 postdoctoral researchers, 2 PhD students, and 60 affiliated persons based on open invitations. The composition of the steering group serves the purpose of connecting the profile with the relevant areas of strength at ÅAU. Wider circles of scholars and scholarly communities surround, continuously support and collaborate in numerous different ways with the group of key academic personnel.

3.2 Funding, publications and doctoral degrees

The amount of competitive and non-competitive research funding (Table 3.1. and Figure 3.1.), the number of scientific publications (Tables 3.2., 3.3. and 3.4.), [8] [9] and the number of awarded doctoral degrees (Table 3.5.) for Minority Research over the years 2016–2023 are presented below.

[8] See footnote 5.

[9] For more details, see Annex 5.

3.2.1 Funding

Table 3.1. Funding from RCF, Business Finland or European Commission received by Minority Research 2016–2023.[10]

	2016	2017	2018	2019	2020	2021	2022	2023
RCF	643 194	2 474 715	287 371	645 431	0	2 583 814	1 295 245	0
BF	0	0	0	0	0	0	0	455 000
Horizon EU	0	207 500	0	0	247 333	0	0	0

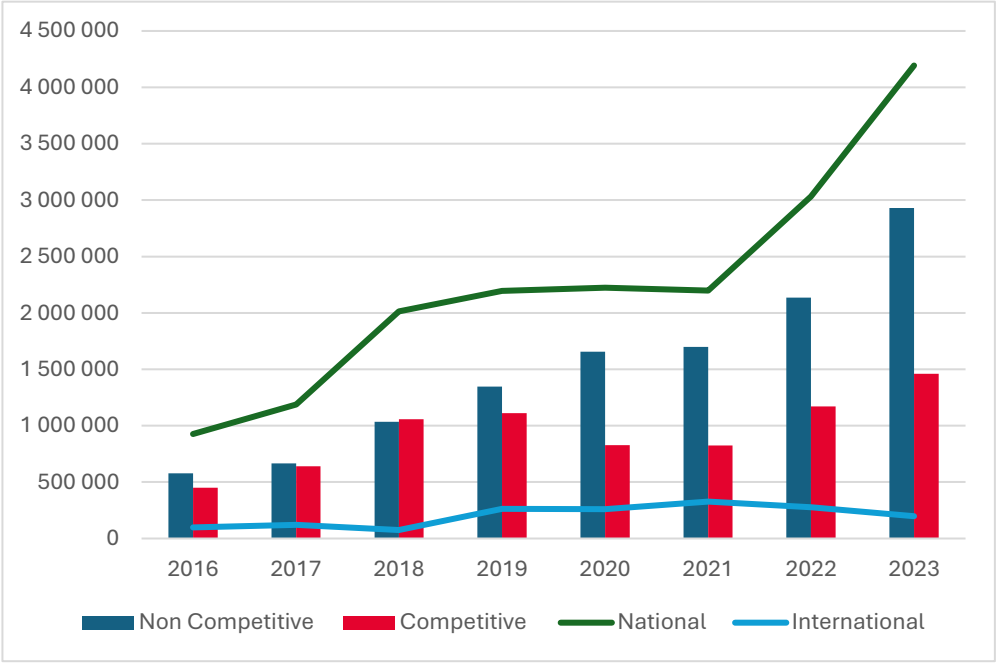

Figure 3.1. External funding received by Minority Research 2016–2023.

[10] The information on the granted external funding 2016–2023 for each SRP was extracted from the following funding portals: the SARA-portal (RCF), Business Finland online service, Funding &Tenders portal (European Commission, Horizon Europe projects). PIs were matched with profile affiliation based on information extracted from AboCRIS. The funding for PIs with multiple affiliations was equally divided on the affiliated profiles. The table indicates the year the funding was *granted.*

3.2.2 Publications

Table 3.2. Number of scientific publications in JUFO categories 1-3 by Minority Research 2016–2023.

JUFO	2016	2017	2018	2019	2020	2021	2022	2023
3	11	17	16	15	38	15	20	28
2	19	31	27	30	36	40	37	52
1	33	59	49	52	69	63	60	57
Total	**63**	**107**	**92**	**97**	**143**	**118**	**117**	**137**

Table 3.3. Published scientific publication according to access type by Minority Research 2016–2023. Open access includes gold, hybrid and self-archived articles.

	2016	2017	2018	2019	2020	2021	2022	2023
Open	50	62	63	94	143	111	124	152
Closed	61	69	61	30	29	22	24	28
Total	**111**	**131**	**124**	**124**	**172**	**133**	**148**	**180**

Table 3.4. The share of international co-publications by Minority Research 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
Yes	32%	27%	39%	41%	38%	35%	39%	35%
No	68%	73%	61%	59%	62%	65%	61%	65%
Total	**111**	**131**	**122**	**124**	**172**	**133**	**148**	**180**

3.2.3 Doctoral degrees

Table 3.5. Number of doctoral degrees awarded within Minority Research 2016–2023.

Profile	2016	2017	2018	2019	2020	2021	2022	2023	Total
Minority	20	18	14	15	10	22	18	10	127

3.3 The development of the quality of the research

When Minority Research started, three tenure track professorships were opened. Of the three tenure track professors, two were tenured in 2020, and are now as full professors key PIs in the profile and members of the steering group of Minority Research. This is an example of how crucial recruitments are as a foundation for research excellence and improved quality.

Minority Research has been successful in obtaining external research funding. Comparing 2023 to 2016, the external funding had increased more than four times and its share of the total external funding of ÅAU had grown from 5% to 15%. Most of the competitive external funding comes from the RCF, while funding from Business Finland and from the EU is merely composed of a few individual projects. In the last round of applications for internal CoEs, the SRP was very successful: two of the granted CoEs are connected to the profile. These are Psychology at the Frontiers: Asylum Interviewing and Decision-Making (Psych-AID) and Religion and Social Exclusion: A Cross-Cultural Approach and New Methodology (RELEX). The increased funding is a sign of quality, and it also provides the resources to undertake research of high quality. Minority Research has not yet succeeded in getting European Research Council (ERC) grants, or Centre of Excellence or Flagship funding from the RCF, which are considered as signs of research excellence.

Since 2016, the number of publications by the members of Minority Research has increased to 180 in 2023. Since the number of both researchers and publications is quite small, the annual variations are quite large (between 111 and 180). The number of publications in the different JUFO categories has been rather constant during 2016 to 2023, apart from year 2020 with especially many JUFO 3 publications (38) and year 2023 with exceptionally many JUFO 2 publications (52). The share of publications with international co-authors has remained stable at about 35%. This is a bit lower than in social sciences and humanities in general in the Nordic countries. For example, in Sweden the share of publications with international co-authors was 48% in social sciences and 33% in humanities during 2019–2021.[11]

The citations of the publications by the members of Minority Research have dropped if one compares the period 2016–2019 with the period 2019–2022. This is the case both when one looks at total citations per publication or at the share of top 10 publications. The share of top 10 publications was 11% during the period 2016–2019 and had dropped below the world average to 9% during the period 2019–2022. Since the publication numbers are small, one should be cautious not making too strong conclusion based on these changes.

[11] Swedish Research Council 2023. The Swedish Research Barometer 2023: Swedish research in international comparison, p. 85. <https://www.vr.se/download/18.71a71bf018f7756f963d781/1716284285923/Swedish%20Research%20Barometer%202023%20VR.pdf> (accessed 27 January 2025).

The databases used for bibliometric analyses (such as Web of Science, used by CWTS Leiden) have a smaller coverage for social sciences and humanities than for other sciences, although the coverage has improved in recent years. Although bibliometric analyses do not cover all the publications, it can still give information about the scientific impacts of the publications included. For example, the most recent assessment of Swedish scientific publications concluded that "Sweden's proportion of highly cited publications is highest in humanities (16 per cent)".[12]

In the self-evaluation, Minority Research puts a lot of emphasis on broadening the scope of minorities, shifting the focus from minority groups per se to the processes of minoritisation. The shifts of focus are very well justified. The broadening of the scope of groups to study is reflected in the publications of the profile, for example in the selected high-quality publications presented to the external expert panel. The increased focus on the processes of minoritisation is so far not very present in the publications. For example, none of the four selected significant publications presented by Minority Research uses the concept of minoritisation. In the self-evaluation it is also stated that "the primary aim of the Minority Research profile is scientific orientation aiming at developing theoretically and methodologically the concept of minorities and minoritisation". Based on the selected publications presented to the external expert panel, so far, the publications do not have such a strong focus on theoretical and methodological aspects as one would expect.[13] Since theoretical and methodological development often takes more time than empirical studies, this might be something to look forward to.

3.4 Impacts on society

The aim of the SRP is to have high societal relevance and impact through a many-sided communication and interaction strategy that engages educational, public, and civil society stakeholders. The SRP has been involved in a collaborative Research-to-Business innovation on digital language learning solutions by ÅAU and Novia University of Applied Sciences. In addition, they arrange multiple

[12] Ibid., p. 78.

[13] One exception is the paper "Twins as a Minority: A Minority Building Perspective" by Lagerspetz (2023), with a strong focus om minority building as a process.

outreach activities. Through the idea of Living Lab, the SRP interacts with stakeholders and has held various events. The SRP uses social media, arranges webinars, posts blogs, and produces podcasts. Furthermore, it has compiled research information on integration for the Prime Minister and has collaborated with The Centre of Expertise in Immigrant Integration at the Ministry of Economic Affairs and Employment. It disseminates knowledge by arranging webinars for civil servants and the broader public. The SRP also leads the Finnish team in the Nordic research consortium Linguistic Justice, Global Migration and the Nordic Welfare State, funded by the Swedish Research Council (2023–2027). It has secured additional large-scale funding to develop co-production and co-research methods for advancing linguistic justice. In sum, the many public outreach activities consist primarily of dissemination of knowledge rather than coproduction of knowledge or working systematically to enhance impact.

3.5 Strengths with respect to increasing research quality and achieving excellence in the future

The recruitment processes of academic staff, postdoctoral researchers and PhD students within the SRP have ensured high-quality research, although we have little information about the number of applicants for these positions. As regards to obtaining funding, the national funding has increased steadily 2016–2023, and the international funding has varied some, but also grown. Profile-related scholars have received grants from mostly domestic sources, like the RCF and various national foundations. The SRP centrally supports funding applications. The fact that the SRP includes researchers at three faculties within multiple disciplines could be a benefit in obtaining national, Nordic, and international funding.

The quality of the research within the SRP is good and for some parts, it is of a high international level. When it comes to collaborations, the SRP has extensive local, national, Nordic and European collaborations, and some collaborations in Canada, the US, and Australia. Further, as regards the relationship of the SRP to the faculties and ÅAU management, it is noted that the deans at the three faculties are in general supportive, and the FHPT has provided some financial support (15%) to administrative staff in 2023–2024.

3.6 Challenges with respect to increasing research quality and achieving excellence in the future

There were only three tenure track professors hired at the SRP, three postdoctoral researchers and two PhD students in 2023. This means that the group of researchers who are engaged in the SRP full-time is relatively small. A question is if the number of tenure track positions should be expanded to ensure high quality research and if the number of PhD scholarships should be expanded to ensure future recruitment.

Although the national and international funding has grown, the SRP struggles to get larger international funding.

The research leadership has a lot of responsibility in directing the research area. The administrative help has been fragmented and scattered across three faculties. It would be a good idea to strengthen the research leadership and communication by a designated long-term coordinator of the SRPs.

3.7 Conclusions and key recommendations

Key observations about the performance of Minority Research during 2016–2023:

- Minority Research SRP is directly linked to the Swedish speaking minority in Finland, which constitutes the foundation to ÅAU. The work with conceptual development and reframing the research area connects the topic of the Swedish minority to a broader context of minorities.
- The quality of the research in Minority Research is good and for some parts it is of high international level
- Minority Research covers a wide thematic scope and lacks a clear focus.
- The shift from minority groups towards processes of minoritisation might be more fruitful in some research and less fruitful in others (e.g. some aspects of law). There seems to be a discrepancy between the theoretical shift in the research area and the content of the publications.
- Minority Research struggles to get larger international funding.

- Minority Research has extensive collaboration partners, but it is not clear how active these collaborations are. Also, with its strong focus on inequality and human rights, some potential collaboration partners are missing.
- The social impact of Minority Research is limited to knowledge dissemination.

Key recommendations for the future, if ÅAU decides to continue to have Minority Research as a SRP:

- Minority Research should develop a clearer focus and narrow the thematic scope.
- There should be more consistency between the theoretical and conceptual development and the actual research that is conducted and the research publications.
- Minority Research should develop a strategy to work systematically to get larger international funding.
- Minority Research should review their collaboration partners and pursue active relevant domestic, Nordic, and international collaborations partners. The SRP has extensive European collaboration, and some in Canada, the US, and Australia. The latter three countries have high quality minority research, and perhaps collaborations with relevant institutions here should be expanded.
- To increase the social impact of Minority Research, the SRP should develop coproduction of knowledge and work systematically to enhance impact.

4 Solutions for Health

4.1 Participants

As regards the composition of the **Solutions for Health** (SfH), any ÅAU research group that considers themselves to be associated with SfH is considered part of SfH. In the first period of the SRP, only subjects/disciplines at FNT, such as biochemistry, cell biology, pharmacy and organic chemistry were included. In 2021, the profile was rebranded as Solutions for Health with the overarching mission to expand to the three other faculties at ÅAU. An inclusive approach was adopted, and the new steering group was specifically asked to include health/caring sciences, IT, logopedics, and psychology as "new" subjects in the profile. Today, the disciplines within the profile include biomedical imaging, cell and molecular biology, health sciences & health economics, information technology, logopedics, organic chemistry and biochemistry, pharmacy, psychology, structural biology and bioinformatics.

During the period 2016–2023, SfH had 67 PIs and was composed of researchers at different levels. Two tenure track professors have been recruited and two strategically chosen adjunct professors have been invited to support the profile, and to contribute to building, and developing strategic research partnerships internationally. The SRP has a joint full professor with the University of Helsinki, within the FinPharma programme, and a joint associate professor with InFLAMES, which is a joint RCF-funded research flagship of ÅAU and the University of Turku (UTU). In the beginning, the SfH was led by the Vice Rector of Research and from 2020, a steering group of four full professors was appointed. From mid-2023 the steering group was expanded to include all four faculties and one representative for Technologies for a Sustainable Future (TSF) and one from the InFLAMES flagship.

The main objective for SfH is to improve the diagnostics, treatment and prevention of disease and the preservation and/or promotion of health in humans. To reach these goals, the ongoing research within the SRP addresses: a) Tools and knowledge to identify emerging disease and disability, b) New treatments and healthcare technologies and c) New healthcare management practices.

4.2 Funding, publications and doctoral degrees

4.2.1 Funding

The total external funding[14] for SfH has steadily increased from EUR 3 million in 2016 to EUR 5.9 million in 2023 (Figure 4.1.). Hence, the total external funding was doubled during the period. In total, the external funding for 2016–2023 was EUR 38.9 million.

The International funding to SfH increased from EUR 487 000 in 2016 to EUR 915 000 in 2023. In total, the international funding during the period 2016–2023 was EUR 5 million. The competitive funding increased from EUR 2.3 million in 2016 to EUR 3.2 million in 2023 with a top in 2019 (EUR 3.7 million). In total, the competitive funding was EUR 24.9 million for the period 2016-2023.

The funding in 2023 from RCF, Business Finland and the European Commission was EUR 4.2 million, EUR 1 million and EUR 0.5 million, respectively, and EUR 3, EUR 1.5 and EUR 0 million respectively in 2016 (Table 4.1.). The funding from the RCF corresponds to 51% of ÅAU total for 2023 and 35% for 2016.

Table 4.1. Funding from RCF, Business Finland or European Commission received by SfH 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
RCF	2 970 855	2 295 835	1 383 636	2 809 558	3 250 349	1 102 238	1 414 548	4 246 609
BF	1 497 950	500 000	0	1 199 000	0	655 000	467 000	984 942
Horizon EU	0	1 083 748	175 000	0	678 928	530 533	0	526 195

[14] See footnote 10.

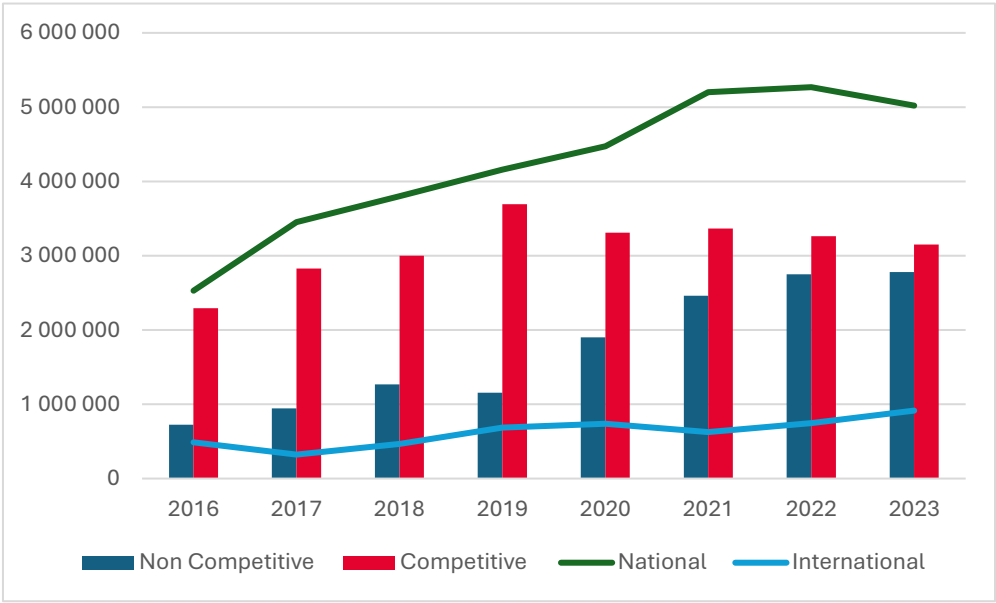

Figure 4.1. External funding received by SfH 2016–2023.

4.2.2 Publications

Regarding the distribution of scientific publications,[15] [16] the level of JUFO 3 classified publications by SfH increased during the period 2016–2023 (Table 4.2.). From 2019 to 2023, the percentage of JUFO 3 publications increased from 10% of all scientific publications to 15%. There were 19 JUFO 3 classified publications in 2016, while eight years later in 2023, the number was 39. In total, 186 JUFO 3 classified publications were published during the period from 2016 to 2023.

The corresponding numbers for JUFO 2 were 68 in 2016 and 51 publications in 2023 and in total 547 publications. For JUFO 1, 126 contributions were reported in 2016 and 153 in 2023, with a total of 1375 publications for the period 2016–2023. In 2016, 30% of the publications were published open access while in 2023, 70% appeared open access making the publications more visible (Table 4.3.).

The number of publications with international co-authors was 157 in 2016 and 194 in 2023, with a top in 2020 (235) (Table 4.4.).

[15] See footnote 5.

[16] For more details, see Annex 6.

Table 4.2. Scientific publications by SfH in JUFO categories 1-3 2016–2023.

JUFO	2016	2017	2018	2019	2020	2021	2022	2023
3	19	23	24	25	11	18	27	39
2	68	94	77	72	73	62	60	51
1	126	155	141	187	219	198	196	153
Total	**213**	**272**	**242**	**284**	**303**	**278**	**283**	**243**

Table 4.3. Published scientific publication according to access type by SfH 2016–2023. Open access includes gold, hybrid and self archived articles.

	2016	2017	2018	2019	2020	2021	2022	2023
Open	61	122	145	211	271	260	273	253
Closed	189	179	111	106	52	41	32	29
Total	**250**	**301**	**256**	**317**	**323**	**301**	**305**	**282**

Table 4.4. The share of international co-publications by SfH 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
Yes	63%	63%	64%	68%	73%	71%	69%	69%
No	37%	37%	36%	32%	27%	29%	31%	31%
Publications	**250**	**301**	**256**	**316**	**323**	**301**	**305**	**281**

4.2.3 Doctoral degrees

The number of doctoral students was 138 during the period 2016–2023 and the number of awarded doctoral degrees was 110 (Table 4.5.).

Table 4.5. Number of doctoral degrees awarded within SfH 2016–2023.

Profile	2016	2017	2018	2019	2020	2021	2022	2023	Total
SfH	17	17	18	11	9	14	10	14	110

4.3 The development of the quality of the research

SfH is a joint focal area originating from a cooperation with UTU that started in 2015, named Drug Development and Diagnostics at that time. With the expansion to new faculties and subjects in 2021, the SRP became Solutions for Health, bringing together disciplines and working towards improving the diagnostics, treatment and prevention of disease, and the preservation of health in humans. The researchers in the SfH are engaged in research areas such as bioimaging and image analyses; molecular drug discovery and drug design; drug

delivery technologies; disease modeling; regenerative therapies; tools to identify emerging disease and disability; new treatments and health care technologies and new health care management practices; improving definitions and diagnostic criteria through epidemiological studies; developing interventions to improve workplace health; dynamic longitudinal modeling of behavioral data to improve and understand interpersonal problems; and science communications. Hence, SfH is characterized by multifaceted and multidisciplinary research activities aimed at offering innovative solutions in the health sector.

In 2020, ÅAU acquired its first Flagship programme, a part of Finland's Flagship Programme (RCF). The InFLAMES Flagship (Innovation Ecosystem Based on the Immune System) is a joint initiative of UTU and ÅAU, and aims at identifying new drug development targets, and developing new medicines together with biotechnology and pharmaceutical companies. InFLAMES is closely connected to SfH.

Regarding education, the national network in pharmaceutical sciences FinPharma was established as a joint endeavor with University of Helsinki and the University of Eastern Finland. Notably, ÅAU has now acquired extended degree rights in Pharmaceutical Sciences (MSc in Pharmacy) and licentiate and doctoral level in Pharmacy, which is a positive development with regards to the SRP's activities.

As apparent from the data on distribution of publications, the number of JUFO 3 publications became significantly higher during the period, especially notably from 2020 with 11 JUFO 3 publications (the lowest number in the 2016–2023 period), 18 in 2021, 27 in 2022 and 39 JUFO 3 publications in 2023. The 2023 data reflect indeed an impressive development.

The national external funding increased rapidly from 2016 to 2021 and has since then remained at about the same level. The competitive funding has increased from EUR 2.3 million in 2016 to EUR 3.2 million in 2023. The non-competitive funding has increased steadily but the competitive funding is fluctuating (highest level in 2019). National funding has increased more significantly than international funding. SfH was granted its highest level of RCF funding (4.2 M€) in the period 2016-2023 in 2023.

Some areas fit well together, as for example, most of the research activities related to the former Drug Development and Diagnostic profile area.

In their self-evaluation report, it is stated that SfH has become too broad. The panel agrees with this assessment.

Biomedical imaging, enabling studies of cells and tissues in detail by applying advanced and world-leading optical laser technology is just one example of an outstanding research area at ÅAU. ÅAU and the Turku area are among the leading regions in Europe. The headquarters of the European research infrastructure Euro-BioImaging ERIC and the Finnish National PET Centre – one of the largest centers for medical imaging in Europe – are both located in Turku. There are other excellent research areas as well. For example, in the self-evaluation of SfH, some recently published high-quality articles representing very different research areas are refererred to which demonstrate the breadth and quality of the research conducted within SfH.

4.4 Impacts on society

The research conducted within SfH aimed at improving the diagnostics, the treatment and prevention of disease and the preservation and/or promotion of health in humans is indeed very relevant for the society and holds promise for the future. Notably, half of the pharmaceutical industry and biotechnology companies in Finland are located in the Turku region and one fifth of all industrial employments are linked to biomedicine. To be active in and do research in such a creative environment with people, skilled in issues related to patents, innovations and business is a clear advantage and will most likely result in new patents, innovations and businesses. Hence, beside the extensive basic research within SfH, there are ongoing collaborations with companies in the region that have provided important innovations. One should make sure that resulting findings can be published by the ÅAU researchers in high impact journals after intellectual property issues have been taken care of. It is foreseen that new enterprises in various fields of biomedicine and drug discovery and development will appear and pharmaceutical companies with different profiles and focusing of a variety of therapies will be established in the future. Most likely, strong valuable bonds to major international companies will be established.

The research activities conducted in SfH will in the long term have a great impact on society, since important issues related to health are addressed. The fact that Turku as a city provides a good environment for research and for businesses related to pharmaceuticals and biomedicine is an advantage.

A successful SfH programme will have a large impact on the society, in particular, in areas related to medicine and biomedicine, for example, for creation of new diagnostics, treatment and prevention of disease and the preservation and/or promotion of health.

4.5 Strengths with respect to increasing research quality and achieving excellence in the future

The fact that the quality of the research conducted in general is very high, and often excellent, holds promise for the future. The number of JUFO 3 publications has become higher, with a top result in 2023. Further, the fact that the external funding, including international funding and funding from the RCF, has increased significantly in recent years is a strong indicator of quality.

There are top researchers in the profile showing ambition, and with demonstrated success in acquiring competitive national and international funding. The apparent close contact and creative collaboration between certain areas within SfH is a strength, and so is the apparent well-developed partnership with the regional enterprises in the pharma area that might result in innovative and excellent research in the future.

4.6 Challenges with respect to increasing research quality and achieving excellence in the future

The major challenge for SfH is to get all diverse research activities within the profile to fit together. The inclusiveness characterizing the profile might most likely result in a lack of focus, and the ambition of SfH appears to serve more as a network for various collaborations, than as a focused strategic profile area. There are also some organizational challenges. It is not clear how successful PIs within SfH are motivated to be a part of the SRP.

4.7 Conclusions and key recommendations

Key observations about the performance of Solutions for Health during 2016–2023:

- Since ÅAU is situated in Turku, the primary area for drug development in Finland, and since the university has many competences related to drug development and diagnostics, the profile fits well at the university.
- The quality of the research in SfH is high and for some parts it is of the highest international level.
- The major strength of SfH is the part which used to be the core of the previous profile area Drug Development and Diagnostics.
- The strong links and collaboration with scientists at UTU, and the existing close connection to the business environment in the Turku area, is of high value and an important advantage for the SRP. As an example, the medicinal chemistry of the Drug Discovery part of the SRP is performed at UTU. It is foreseen that these valuable contacts will become even more extended and attractive in the future.
- Within the SRP, there are parts that have been exceptionally successful in reserving competitive excellence funding, such as ERC and RCF flagship. Some researchers interviewed reported straight impact of joining SfH.
- While some parts of the SRP are characterized by a strong publication record, the overall share of the top 10 publications is not higher than the world average.
- Although most SfH researchers are engaged in extensive international collaborations, demonstrated for example by the joint publications, there is limited interest for longer research visits. There is a need for more extensive international mobility of scientists in SfH, at all levels.

Key recommendations for the future, if ÅAU decides to continue to have SfH as an SRP:

- The research environments performing high quality excellent research should be recognized by the university leadership and supported by funding. Special focus should be put on younger or

newly recruited promising scientists. These individuals should be well informed about what is needed to make successful careers at the university and encouraged to frequently visit and learn from laboratories of high international standard abroad.

- Recruitment is a challenge. Efforts to improve the attractiveness of ÅAU and a more efficient recruitment process are very important. Identification of talented scientists early in their career, currently working in Sweden or other Nordic countries, and then actively contacting these potential applicants could be one possibility to recruit future talents to ÅAU.
- Efforts to make SfH less broad and more focused should be seriously considered by the management in the future.
- International collaborations should be encouraged. An active participation in high quality exchange programmes and constructive contacts with innovative biotech companies, when applicable, is most often of great value and should be encouraged.

5 Technologies for a Sustainable Future

5.1 Participants

Technologies for a Sustainable Future (TSF) is led by a steering group that sets the goals for, manages and follows up on the profiling activities. The steering group has six members with complementary expertise in chemistry, chemical engineering, sustainability measurements, control and management and industrial digitalization with a focus on data utilization and combining AI with engineering applications. The steering group handles the recruitment of personnel to TSF in collaboration with the ÅAU HR services and FNT. The steering group contributes to reporting ongoing profiling activities and to writing new Profi applications in collaboration with the Vice-Rector for Research at ÅAU. In addition to the professors in the steering group, five more professors are part of the core research area. Additionally, six professors with supplementing expertise in e.g. functional materials, surface chemistry, coating technologies, CO_2 capture, utilization and storage are involved. In total, around 17 professors at varying career stages are part of TSF. In addition to the internal professors, TSF has invited adjunct professors that strategically support the SRP. Regarding the development of the composition and participants there is a clear development towards more interdisciplinary composition and collaboration. Strategic recruitments of two tenure track professors were made during Profi 1.

5.2 Funding, publications and doctoral degrees

The amount of competitive and non-competitive research funding (Table 5.1. and Figure 5.1.),[17] the number of scientific publications (Tables 5.2., 5.3. and 5.4.),[18] [19] and the number of awarded doctoral degrees (Table 5.5.) for TSF over the years 2016–2023 are presented below.

[17] See footnote 10.

[18] See footnote 5.

[19] For more details, see Annex 7.

5.2.1 Funding

Table 5.1. Funding from RCF, Business Finland and European Commission received by TSF 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
RCF	855 619	1 911 033	2 011 495	1 612 221	730 800	2 319 659	1 280 960	2 153 979
BF	997 350	802 079	743 998	1 105 000	83 819	4 248 210	3 294 799	6 805 698
Horizon EU	346 346	46 736	803 500	0	0	127 500	626 963	1 741 897

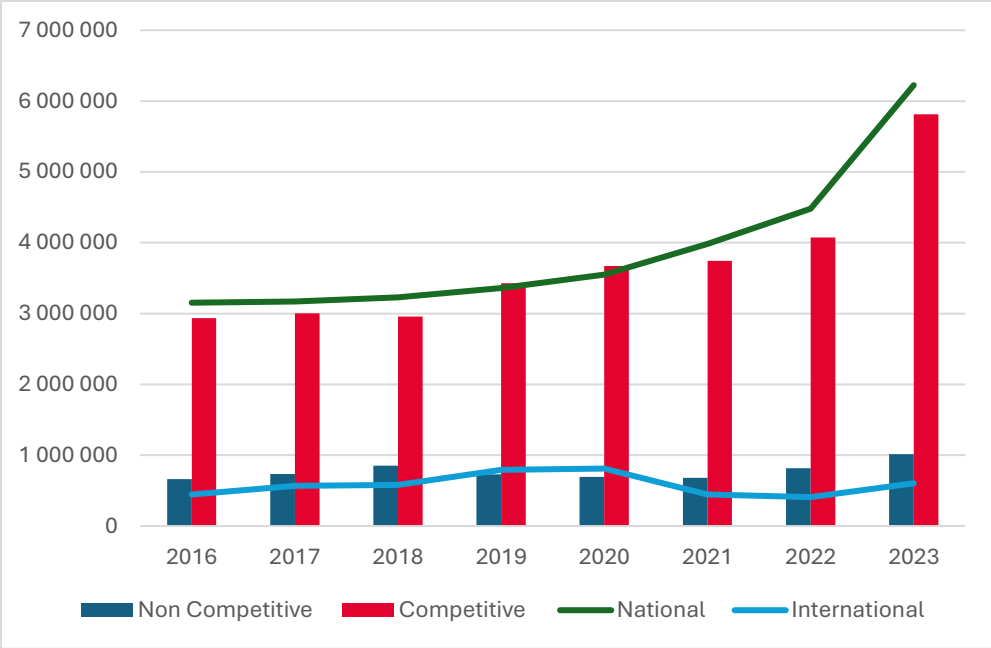

Figure 5.1. External funding received by TSF 2016–2023.

5.2.2 Publications

Table 5.2. Number of scientific publications in JUFO categories 1-3 by TSF 2016–2023.

JUFO	2016	2017	2018	2019	2020	2021	2022	2023
3	9	20	17	21	16	21	25	29
2	63	61	62	59	60	71	70	55
1	135	107	119	166	193	177	161	135
Total	**207**	**188**	**198**	**246**	**269**	**269**	**256**	**219**

Table 5.3. Published scientific publication according to access type TSF 2016–2023. Open access includes gold, hybrid and self-archived articles.

	2016	2017	2018	2019	2020	2021	2022	2023
Open	24	46	94	185	243	240	233	200
Closed	220	178	130	87	46	47	46	40
Total	**244**	**224**	**224**	**272**	**289**	**287**	**279**	**240**

Table 5.4. The share of international co-publications by TSF 2016–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
Yes	57%	52%	61%	70%	74%	74%	72%	74%
No	43%	48%	39%	30%	26%	26%	28%	26%
Publications	**244**	**224**	**224**	**272**	**289**	**287**	**279**	**239**

5.2.3 Doctoral degrees

The number of completed PhDs within TSF has decreased, and in 2023 the number of awarded doctoral degrees was less than half of the number in 2016.

Table 5.5. Number of doctoral degrees awarded within TSF 2016–2023.

Profile	2016	2017	2018	2019	2020	2021	2022	2023	Total
TSF	21	16	17	15	18	14	12	9	122

5.3 The development of the quality of the research

There is a lot of positive development over time in the quality of research within the SRP. This includes especially the strategic partnerships, strategic recruitments, and internal and external collaboration. Current total funding is more than four times higher compared to the start of the assessed period. It is noticeable that most of the projects are collaborative efforts within the SRP, a result of systematic development of complementary activities. During the interviews it became clear that the exceptionally high level of Business Finland funding was a result from this collaboration and joint brainstorming sessions.

The TSF had in their self-evaluation identified Aalto University and Departments of Bioproducts and Biosystems (BIO2) and Chemistry and Materials Science (CMAT) as well as Stanford Department of Chemical Engineering as benchmark departments.

Compared to Aalto University's BIO2 and CMAT departments, the level of research is in many aspects, like with respect to the number of publications and doctoral degrees, on a similar level. However, with respect to RCF funding or grants showing topmost excellence, like ERC grants, the benchmark departments are on a higher level. Positive exceptions are the Academy professorship and A.I Virtanen Prize of Tapio Salmi and ERC starting grant of Eleonora Maccia. According to the QS World University Ranking 2024, Stanford University achieves the 5th place in the world, while Aalto is ranked 109th and ÅAU 601-610th place. This ranking compares the whole universities and are not necessarily indicative of the quality of research of the TSF.

The TSF profiling area has worked systematically to renew the research and strengthen the area. Excellent examples of this are the recruitments of two new tenure track professors in key research areas, ensuring long-term continuity of the profile. Especially Henrik Grénman seems to be able to attract competitive funding (including RCF) and has an active research output. While the strategic tenure track recruitments in early stages of profiling have been very successful, the lack of interest to continue this type of strategic recruitments in the future is surprising. We foresee that strategic tenure track professor recruitments would be an important tool for renewal, and a careful consideration of the defined research area as well as attracting top candidates should be considered during all recruitments of professors.

Inviting well known scientists as adjunct professors to support the profile has been beneficial for TSF. The collaboration with Luisa Torsi has led to one ERC starting grant. Thomas Rosenau is one of the top scientists in the field and his position as adjunct professor has led to increased collaboration with BOKU University. Pedro Fardim is very active in European collaboration.

International strategic partnerships have been established, e.g. with Denmark's Technical University in 2017, BOKU University in 2018, and Guangzhou University in 2019 and ÅAU is part of the European alliance CHARM-EU. Hopefully these partnerships, established networks and adjunct professors will be efficiently utilized to increase both international collaboration and funding. Currently, the researchers seem a bit too comfortable at ÅAU and not interested in longer research visits abroad.

The different parts of the SRP fit rather well together. Most of the groups are within one faculty. Nevertheless, the SRP is too broad to reach excellence. Strong

groups within the SRP should be identified and supported. While the research has a clear focus, the name of the SRP is too broad and does not describe the focus of the research very well.

5.4 Impacts on society

The SRP has very good collaboration with industry with a high level of Business Finland funding but also significant directly industrially funded projects. In this way, the SRP supports the renewal of national applied research, giving Finnish industry a competitive edge in the global competition. Especially the forest sector is currently struggling with the negative effects that digitalization, the current geopolitical situation, and the climate change have had, with decreasing demand of specialty paper and increasing prize of timber. Hence, novel products and new avenues for the industry are needed. During the interview, the steering group gave examples of a few success stories where research had led to new businesses and spinoff companies.

TSF's research is strong on analytics and method development. The SRP strengthens their research on the decarbonization of industrial processes by further enhancing the interdisciplinary links between emerging core areas of research. Focusing their research on the mitigation of climate change attracts young students as well as merited researchers to the faculty. The outreach programme targeting high school students as well as the Aboa Tech Talks help in attracting students, as well as giving science-based competences a voice in society.

5.5 Strengths with respect to increasing research quality and achieving excellence in the future

The strength of the SRP is the combination of basic chemistry and chemical engineering, going from molecules to processes. Excellent infrastructure and expertise in analytics are also assets.

Collaboration, especially strategic international collaboration, local collaboration with UTU and with industry as well as collaboration within the TSF has enabled a significant increase in total funding, especially in the Business Finland funding for applied research. The success in securing Business Finland funding is a result of joint meetings and collaboration between PIs within the

SRP. The fact that most of the SRP is concentrated within the same faculty (FNT) facilitates leadership and makes the collaboration easy. The SRP is part of several international partnerships showing that there is a clear interest to strengthen the international collaboration.

Researchers within the SRP appreciate the joint activities and the access to complementary expertise and research infrastructure. They further found that they got new ideas from transdisciplinary collaboration and belonging to a SRP enabled them both to see the relevance of their work and to put their work into a larger context. The collaborative attitude probably decreases internal competition and strengthens possibility to be internationally competitive. Strategic recruitment of tenure track professors and invitation of strategic adjunct professors has also led to significant strengthening of the research field. The interdisciplinary approach is also a strength.

While the total amount of publications has remained more or less on the same level, the share of high level (JUFO 3), and international publications has increased during 2016–2023.

5.6 Challenges with respect to increasing research quality and achieving excellence in the future

While the overall level of research is good, there is still a gap to reach the highest international level of research (according to the self-evaluation report, the goal is to achieve the highest international level of research in the field of sustainable molecular process technology). To reach this level, more ERC grants, RCF funding and international competitive funding is needed. Especially regarding funding from European Commission, professors lack time and information on support available as well as knowledge on suitable calls that are coming up. During the interviews it became clear that the SRP does not have enough mandate in recruitments and there is not enough money for strategic recruitments. Hence, the SRP is actually not a focused SRP but more of a network for collaboration. This does not support excellence.

While the strong collaboration with industry is a strength, it may also be a challenge if professors focus too much on only industrial collaboration. It is important that research results can be published and that there is also time for basic research.

Although the SRP had strategic international collaboration with Nordic and European universities, the researchers participating in the interview did not show interest in international mobility.

All the activities in TFS are very much in line with the university's strategy now and in the future. Focus on solving global challenges as well as the work on attracting and fostering young talents in science and technology is highly relevant. The interdisciplinary collaboration is also beneficial for attracting national funding. Nevertheless, the role of the SRP is unclear. The steering group of the SRP does not have mandate in recruitments.

5.7 Conclusions and key recommendations

Key observations about the performance of TSF during 2016–2023:

- The strength of TSF is the combination of basic chemistry and chemical engineering, going from molecules to processes. Additional strengths are good infrastructure and expertise in analytics. These strengths make the SRP attractive for industrial collaboration but could also make them attractive for scientific collaboration.
- The focus of TSF is well in line with current global challenges and the strategy of ÅAU.
- TSF has very strong collaboration with industry, strategic partnerships with research institutes (VTT) and key industries and excellent success with getting funding from Business Finland.
- While the overall level of research by TSF is good, there is still a gap to reach the highest international level of research. The RCF funding is quite low and there could be more funding from the European Commission.
- The internal collaboration within TSF and the regional collaboration with UTU are excellent. However, the SRP would benefit from more international mobility of scientists at all levels.
- The total number of peer reviewed publications by TSF has remained roughly on the same level, however the number of publications in JUFO 3 journals has increased.

Key recommendations for the future, if ÅAU decides to continue to have TSF as an SRP:

- Research integrity is needed both regarding international collaboration and company collaboration. In industrial collaboration the university/professor needs to ensure that the research is benefitting them and is in line with their research strategy. The research performed in collaboration with companies should still advance the science.
- Regarding international collaboration, it is important that there is a balance between collaborations where the ÅAU scientist has a minor role in research led by an international expert and work where ÅAU has a leading role (being first or corresponding author).
- Excellence should be identified and supported. Young scientists with ambition for academic career should be informed about the qualifications needed. For example, encouraging longer research visits abroad.
- Gender equality should be considered. It was surprising that out of eight young scientists in the panel, only one was female. The leading professors were also six men and one woman. If this selection represents the general trend at the SRP, strategic efforts should be put to both foster female talents as well as consider gender equality in recruitments.
- Strategic measures are needed to get more both national and international competitive funding.

6 The sea

6.1 Participants

The Sea SRP consists of PIs in marine biology, governance, industrial engineering and management, and maritime law. The SRP can be considered a broad platform with a core group of PIs and a larger group of affiliated researchers. Each PI has their own research team, where individual researchers at different levels (PhD students, postdoctoral researchers, research managers) are employed. More than 30 researchers, from senior professors to PhD students, are currently involved in research, outreach, and, to some extent, educational activities. The research groups belonging to the Sea community currently include environmental and marine biology, industrial engineering and management, social sciences/public leadership, law, as well as other affiliated researchers. The SRP has a steering group that consists of six members.

6.2 Funding, publications and doctoral degrees

The amount of competitive and non-competitive research funding (Table 6.1. and Figure 6.1.),[20] the number of scientific publications (Tables 6.2., 6.3. and 6.4.),[21] [22] and the number of awarded doctoral degrees (Table 6.5.) for the Sea over the years 2017–2023 are presented below.

6.2.1 Funding

Table 6.1. Funding from RCF, Business Finland or European Commission received by the Sea 2017–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
RCF	n.d.	0	850102	274981	403251	176020	0	0
BF	n.d.	364679	0	27000	83819	420500	313500	488750
Horizon EU	n.d.	0	51674	319700	0	0	1004833	535563

[20] See footnote 10.

[21] See foonote 5.

[22] For more details, see Annex 8.

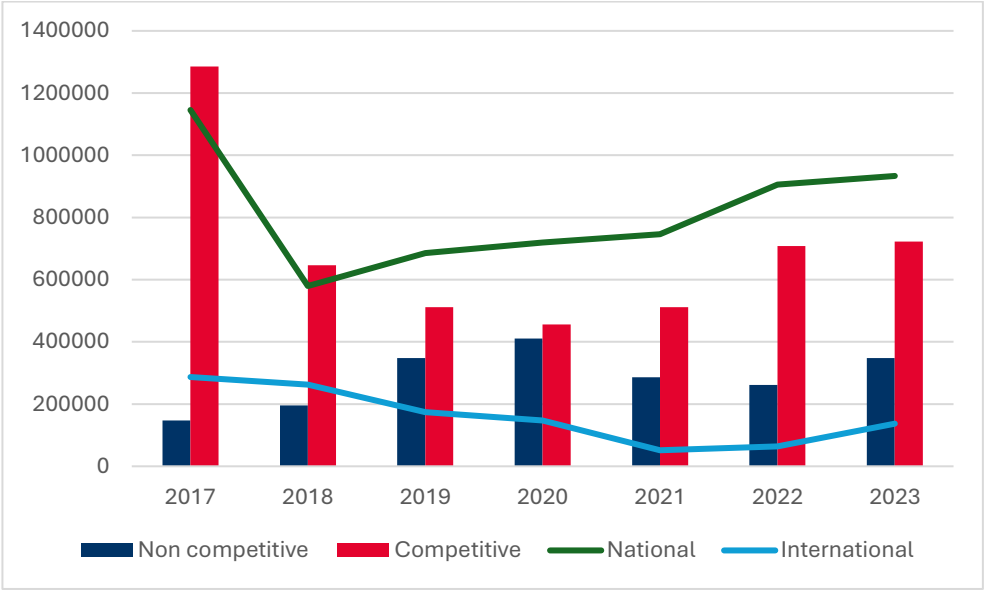

Figure 6.1. External funding received by the Sea 2017–2023.

6.2.2 Publications

Table 6.2. Number of scientific publications in JUFO categories 1-3 by the Sea 2017–2023.

JUFO	2016	2017	2018	2019	2020	2021	2022	2023
3	n.d.	14	1	4	13	7	11	6
2	n.d.	6	8	9	18	15	13	16
1	n.d.	23	30	25	30	26	32	23
Total		**43**	**39**	**38**	**61**	**48**	**56**	**45**

Table 6.3. Published scientific publication according to access type by the Sea 2017–2023. Open access includes gold, hybrid and self-archived articles.

	2016	2017	2018	2019	2020	2021	2022	2023
Open	n.d.	14	25	33	43	45	55	38
Closed	n.d.	34	20	6	25	8	7	14
Total		**48**	**45**	**39**	**68**	**53**	**62**	**52**

Table 6.4. The share of international co-publications by the Sea 2017–2023.

	2016	2017	2018	2019	2020	2021	2022	2023
Yes	n.d.	42%	38%	56%	46%	62%	65%	48%
No	n.d.	58%	62%	44%	54%	38%	35%	52%
Publications	**36**	**48**	**45**	**39**	**68**	**53**	**62**	**52**

6.2.3 Doctoral degrees

Table 6.5. Number of doctoral degrees awarded within the Sea 2017–2023.

Profile	2016	2017	2018	2019	2020	2021	2022	2023	Total
The Sea	n.d.	5	2	2	4	3	2	0	21

6.3 The development of the quality of the research

The SRP has expanded in terms of affiliated researchers, project portfolio, and collaboration networks since its inception. It can be considered a broad platform with a core group of PIs and a larger group of affiliated researchers. More than 30 researchers, from senior professors to PhD students, are involved in research, outreach, and, to some extent, educational activities.

The Sea has become recognized as an interdisciplinary research environment with expertise in marine biodiversity, related governance challenges, and co-creation methodologies. It has become a valued research, education, and policy partner for interdisciplinary marine research. The platform has also played a crucial role in establishing new collaborative initiatives at ÅAU, including the Centre of Excellence for Sustainable Ocean Science (CoE SOS) and the Nordic Sea Hub, a network for Baltic Sea researchers.

The area has mobilized a group of engaged scholars, built national and international networks, and made use of national and university infrastructures. The SRP also has a clear organizational structure, with a division of responsibilities among its members. The tenure track professors recruited during the first years of the SRP have now established themselves as leaders of different parts of the area. The management of the Sea is well organized with a steering group meeting 3-4 times a year, an operational group meeting every second week and research seminar every month.

While the scientific impact of platform activities could be supported by success in securing external funding and publications in well renowned journals, we note that the amount of external funds actually decreased during the first years of the strategic profile areas. However, both international and national funding has increased since 2021 with affiliated researchers playing key coordinating roles and the Sea is relatively strong in attracting EU funds. The number of publications has remained relatively stable over time but there is a slight increase of publications in higher-quality journals and the SRP has more international co-authorship and stronger citation record than ÅAU in general.

Given the time lag between formulating a research idea, attracting funding, implementing a project, publishing results, and citations, it is too early to assess the scientific impact of the output produced within the SRP during recent years. We can, however, say something about the renewal of research and the prospects of excellence. Expertise in maritime law and studies on autonomous shipping are, besides the transdisciplinary setting, emphasized as unique in the self-evaluation. This is also reflected in the studies highlighted as key by the profile area. Thus, the overall impression is that the research setting, and methodological approach including transdisciplinary and living lab methodology, are considered as the primary comparative advantage in relation to other national institutions.

The scope of the SRP is broad and has been deliberately expanded over the years. It now encompasses marine biodiversity and environmental studies, governance, industrial engineering and management, maritime law, international marketing and technology, and, more recently, business studies focusing on entrepreneurship as well as humanities/ethics. This expansion was motivated by an intention to focus more on sustainable blue transitions and their ethical dimensions, and to address issues related to justice and equity. Moreover, ideas about including climate change alongside biodiversity and bridging the border between art and science have been discussed at the platform. Analyzing the project portfolio and key publications identified by the SRP, it is evident that they share a broad focus on marine environments, sustainability, and environmental concerns besides the more methodologically oriented studies. These connections are still rather general than focused, reflecting various interests across marine and ecological research aspects without a tightly integrated core focused around one or two research problems. The high interdisciplinary ambitions have, however, resulted in joint publications which

indicate the formation of strong collaboration ties within the core of the profile area.

Thus, the Sea's scientific subjects and research topics align under a broad thematic umbrella. This inclusive scope forms a hub for interdisciplinary research on marine sustainability. The inclusive scope has served the aim to form both internal and external network and is likely what makes the Sea an attractive collaborative research partner on the EU level. However, if the ambition is to carve out a more distinct research niche and tackle a more focused set of research problems to achieve excellence in research, the area is likely too broad.

6.4 Impacts on society

The SRP has set ambitious goals regarding societal relevance and impact. The idea is that adopting the living lab methodology and emphasizing transdisciplinary co-creation of knowledge will bridge the science-policy-practice interface throughout the research process. The commitment to producing societally relevant knowledge is clearly outspoken and translated into action. Education is viewed as one channel for communication, the appointment of a Professor of Practice as another, and the involvement of PIs in various policy groups is considered an indicator of how the surrounding society recognizes the Sea. We acknowledge that favorable conditions for future societal impacts have been established but note also the lack of concrete outcomes, or illustrative examples, of how the activities within the Sea have influenced actors or processes in the surrounding society. The extent to which the research affiliated with the platform has consistently applied these co-creational methodologies remains unclear both from self-evaluation and interviews and strong success stories about tangible societal impact of research outputs are lacking.

6.5 Strengths with respect to increasing research quality and achieving excellence in the future

The overall impression is that the SPR has been a platform, which has mobilized and engaged scholars with high ambitions to collaborate and create something new. The Sea has successfully developed a platform, with national and European recognition, for interdisciplinary research and collaboration addressing the challenges of marine environments. The prospects for securing further research funding and increasing the volume of publications appear favorable and have,

until now, likely been aided by the more inclusive nature of the SRP. Funding for marine research is often requesting multi-disciplinary consortiums and having the expertise collected within the same unit might be considered an advantage from the perspective of potential partners, particularly in the European context.

While it is too early to assess the long-term impact and evaluate the quality and impact of the research, the current project portfolio and the established networks, the research shows strength and ability to continue to grow. An important indicator of success is that the SRP has contributed to creating other units, such as the CoE SOS and the Nordic Sea Hub. These developments suggest high ambition and favorable conditions for the future since they might enable a division of labour to handle the weaknesses of the current approach (see below) by balancing inclusiveness and the need for sharper focus. The SOS Centre could support necessary consolidation and the development of a core of excellent research that can complement the broader profile area and the network ambitions of the Hub.

6.6 Challenges with respect to increasing research quality and achieving excellence in the future

The prospects for the Sea for securing additional research funding and increasing publication output are promising. However, achieving excellence in research and enhancing both scientific and societal impact would benefit from narrowing the scope and placing greater emphasis on scientific contributions rather than focusing primarily on methodological approaches. While the transdisciplinary approach and co-creational ambitions are promising and undoubtedly valuable, the uniqueness of this approach in relation to other research environments can be questioned and their impact on research quality and output, as well as societal impact, must be demonstrated. The core team of the Sea needs to reassess the scope of the area, its uniqueness, and its overarching and long-term goals to define ambitions and establish objectives and benchmarks for progress. The methodological approach can be the means to produce new knowledge, but not the end nor the competitive edge in the long run.

Uncertainties regarding the future status of the SRPs at ÅAU, and what resources that can be expected in the future, present critical challenges to the work. These uncertainties will likely impact vital areas such as the ability to engage scholars

in common activities and future recruitments as well as the ability to form strategic alliances with business partners and public organizations.

The need for long-term strategies is evident. The relationship between the Sea, the CoE SOS, and the Sea Hub network also remains somewhat unclear and will need to be clarified to ensure effective coordination and optimal resource allocation in the future.

The Sea has established ÅAU as a recognized hub for interdisciplinary marine research, with the potential to assume a vital role within European research networks and science-policy dialogues while also contributing to future educational initiatives. The future direction of the SRP will largely depend on strategic decisions made by both university management and the SRP leadership. Key issues to be addressed include clarifying the SRP's vision, status, and scope and defining its operational goals. Additionally, consideration must be given to how the SRP should be coordinated with other ongoing university initiatives to ensure that resources are used wisely. Therefore, the goals and focus of the CoE SOS and the Sea Hub and their relationship to the Sea should be carefully considered when shaping future strategies.

6.7 Conclusions and key recommendations

Key observations about the performance of the Sea during 2016–2023:

- The overall topic of the Sea addresses critical societal challenges and is well in line with the ÅAU strategy.
- The Sea has successfully become an internal platform for engaged and committed scholars, with the recruited tenure tracks now leading the area, and an externally recognized hub and partner for interdisciplinary marine research at the European level.
- The quality of the research in the Sea is good and shows significant scientific impact.
- The international and national funding is increasing since 2021, after a downward trend.
- The number of publications has, somewhat surprisingly, remained rather stable while the quality of publications is slightly increasing.

In comparison with other areas at ÅAU, the publications are more frequently cited and co-authored with international scholars.

- The Sea has successfully contributed to new and critical collaborative efforts at ÅAU, such as the CoE SOS and the Nordic Sea Hub.
- While the interdisciplinary and co-creational approach is promising, its uniqueness in relation to other research environments can be questioned, and the ability to result in new innovative research questions and empirical results needs to be demonstrated.
- The interdisciplinary and inclusive scope of the Sea has fostered collaboration networks and increased opportunities for funding, but it likely too broad if the goal is to achieve excellence in research.

Key recommendations for the future, if ÅAU decides to continue to have the Sea as an SRP:

- The Sea is recommended to revisit its long-term goals to establish clear objectives and to formulate a joint effort that focuses more on common research problems than the methodological approaches. The interdisciplinary approach and co-creational methodologies are likely better perceived as tools rather than the defining competitive advantage of the area.
- Clarification is needed on the relation between the Sea, the CoE SOS, and the Nordic Sea Hub to improve coordination and ensure an effective use of resources in the future. This task is dependent on the university management formulating and communicating a clear vision about the future role, and expectations, of the SRPs at ÅAU.
- The CoE SOS can be crucial for consolidating the work that has been developed within the Sea this far. It can potentially advance excellence in research and complement the broader ambitions of the Sea, as an internal platform, and the Sea Hub as an external platform supporting Nordic networks.

7 The role of the research environment for the faculties and for ÅAU

7.1 The development of the research at ÅAU 2016–2023 and the role of the SRPs for the development in the future

In the years 2016 to 2023, the global investments in research have continued to increase, especially in China. During this period the number of publications has also increased, and China has moved to become number one in both highly cited publications and in the number of publications in the journals considered to be of the highest quality.

It is against this background that most countries, research funders and universities have taken actions to reposition themselves. In Finland, the funding for profiling introduced in 2014 was intended to be an instrument helping the universities to position themselves in a world with more universities and harder competition.

ÅAU is a small Finnish university with a broad task in education. As stated in its first application for profiling in 2015, the mission of ÅAU is to be the "provider for the educational needs of the Swedish-speaking and the bilingual inhabitants of Finland in particular". The ÅAU's strategy to 2030 states "With special responsibility for Swedish in Finland, we provide education, training, relevant research and expertise, both nationally and internationally".

With respect to fulltime employees, there were four smaller universities than ÅAU in Finland in 2023.[23] During the period 2019–2022, ÅAU had the smallest number of publications (based on fractional counting) of the nine Finnish universities included in the CWTS Leiden Ranking 2024 and the second smallest

[23] In 2023 Hanken School of Economics had 166 full-time equivalents (FTE), University of Lapland had 304 FTE; University of Vasa had 347 FTE, University of the Arts in Helsinki had 423 FTE, and ÅAU had 647 FTE. Education statistics Finland, vipunen.fi (accessed 27 January 2025).

when fractional counting is not applied, but the four smaller Finnish universities were not included.[24]

During the period 2016–2022, the time devoted to research has increased by 11,6% at ÅAU. However, this was after a drop of almost 30% between 2012 and 2016.[25] The bibliometric analyses described in Section 7 and in Table 7.1 show that the number of publications has increased for three out of four faculties, but the fractioned publications have increased only for the FPV.

Table 7.1. Publication outputs and share of top 10 publications of the faculties at ÅAU.

	2016-2019			2019-2022		
Faculty	**Publications**	**Pub fractions**	**PP [top 10%]**	**Publications**	**Pub fractions**	**PP [top 10%]**
FPV	147	77	0,05	215	105	0,05
FHPT	257	134	0,07	239	111	0,06
FNT	1736	734	0,09	1772	684	0,10
FSEJ	226	137	0,11	257	138	0,10

For all four faculties, the share of top 10 publications is higher among the publications that are written with international co-authors than among publications that have only national coauthors or all authors from ÅAU. This is not surprising since similar results have previously been seen for Finland, Sweden and Denmark.

For ÅAU, the share of publications with international co-authors has been between 39% and 50% during the years 2016–2023, being 45% in 2023. This is above the average for Finland during 2018–2021, which was 40%,[26] but below

[24] CWTS Leiden Ranking 2024. <https://www.leidenranking.com/ranking/2024/list> (accessed 27 January 2025).

[25] Research.fi 2024. Research full-time equivalents' (Research FTEs') development at higher education institutions and government research institutes. <https://tiedejatutkimus.fi/fi/science-innovation-policy/science-research-figures/s2_1> (accessed 27 January 2025).

[26] RCF 2024. State of scientific research in Finland: Statistics on research funding, research personnel and scientific publishing, p. 28. <https://www.aka.fi/globalassets/2-suomen-akatemian-toiminta/2-tietoaineistot/state-of-scientitifc-research-2024.pdf> (accessed 27 January 2025).

the average for Sweden, which during 2019–2021 was 70%.[27] Although international co-authorship on average results in a higher share of top 10 publications, there are considerable differences depending on which countries the co-authors are from. In Finland, the highest shares of top 10 publications are with co-authors from the USA, Australia and Kina, whereas publications with co-authors from Russia, Norway and Sweden have a lower share of top 10 publications than the world average and publications without international co-authors. Although internationalization as such should be supported and every researcher should be free to collaborate and publish with whom they like to, it would be important for the leadership of ÅAU to think how they could support strategic collaboration.

Table 7.2. Publication outputs and share of top 10 publications of the SRPs at ÅAU.

	2016–2019			2019–2022		
SRP	**Publications**	**Pub fractions**	**PP [top 10%]**	**Publications**	**Pub fractions**	**PP [top 10%]**
Minority	138	84	0,11	165	89	0,09
TSF	779	372	0,08	927	400	0,09
SfH	862	345	0,10	967	359	0,11
The Sea	97	46	0,07	125	47	0,11

From Table 7.2 one can observe that three out of four SRPs have increased their share of top 10 publications, but since the publication numbers are relatively small, one should be careful to draw any firm conclusions. In the later period 2019–2022, the Sea and SfH had a slightly higher share of top 10 publications than the global average, whereas Minority Research and TSF had a share of top 10 publications slightly below the global average.

If one compares the citations of the SRPs (Table 7.2) with those of the whole university and the faculties (Table 7.1), one can conclude that the SRPs have a slightly higher share of top 10 publications. The difference is, however, not very big and smaller than what one would expect for areas that have been getting special attention and resources. The Sea and SfH have a higher share of top 10 publications than all faculties. Minority Research has a higher share than FPV

[27] Regeringen 2024. Forskning och innovation för framtid, nyfikenhet och nytta, Regeringens proposition 2024/25:60, p. 30. https://regeringen.se/contentassets/a70996e2f9de4222b5a6880d33c20d35/forskning-och-innovation-for-framtid-nyfikenhet-och-nytta-prop.-20242560.pdf (accessed 27 January 2025).

but a lower share than FSEJ. Finally, a bit surprisingly, TSF has a lower share of top 10 publications than FNT to which most of the researchers in the SRP belong.

Also, for the profile areas the share of top 10 publications is higher among the publications that are written with international co-authors than among publications that have only national coauthors or all authors from ÅAU. Among the SRPs, the Sea stands out, with a share of 14% top 10 publications among the articles with international co-authors. TSF had a share of top 10 publications slightly below the global average even for the publications with international coauthors.

The evaluation has not only studied the publication statistics, but we have also examined the publications that each SRP have submitted as examples of the quality of their research. Based on these publications, one can conclude that all SRPs undertake and publish research of good international quality and in some cases even very high quality. In some cases, the submitted publications were quite far from the key aims of the SRP. This is not a problem per se, but it is of course important that each SRP also conducts research that contributes to progress in relation to its key objectives.

Increased internationalization has been an aim for Finnish research policies and Finnish universities to increase the quality of the research through new perspectives and connections. Foreign teaching and research personnel at career stages 3-4 at ÅAU was 192 FTEs in 2022, which was a slightly higher proportion of total university full-time equivalents (FTEs) than in 2016 and 2019.[28] For career stages 1–2, the share of foreign personnel is higher, about 25% but the difference to Aalto University which has the highest share in Finland (about 60%) is huge.[29]

All SRPs have recruited tenure track professors through open calls. The recruited tenure track professors are now full professors and are considered very important PIs for obtaining external funding and renewing the research of the SRPs. Still, there was no particular interest to recruit additional tenure track

[28] RCF 2023. State of scientific research in Finland: Research funding, research personnel and scientific publishing, p. 17. <https://www.aka.fi/globalassets/2-suomen-akatemian-toiminta/2-tietoaineistot/state-of-scientific-research-finland-2023.pdf> (accessed 27 January 2025).

[29] Ibid, p. 16.

professors. All SRPs pointed out aspects of the recruitment processes that could be improved.

The SRPs have increased their external funding as compared to 2016. In 2016, the total external funding of the SRPs was EUR 8.7 million, which was about 41% of the total external funding of ÅAU. In 2023, the total external funding of the SRPs was EUR 18.2 million, which was about 62% of the total external funding of ÅAU. The Minority SRP increased their external funding four times, while SfH and TSF doubled their external funding, and the Sea has almost reached the same level that they had in 2016 after a big drop in 2018. Since 2016, the external funding of ÅAU has increased with EUR 8.2 million. During the same time, the SRPs have increased their external funding with EUR 9.5 million. This implies that the researchers that are not part of any SRP have got EUR 1.3 million less in external funding in 2023 than in 2016, which should be a serious concern for the ÅAU leadership.

The increase in external funding is mainly from domestic funders. When it comes to EU funding, the amounts are small for all SRPs. The amounts received in a year can for an individual SRP fluctuate depending on a single application. During 2016–2023, TSF got about EUR 3.7 million from the EU, followed by SFH that got EUR 3 million and the Sea with EUR 2.2 million.

Key observations about the performance of the SRPs during 2016-2023:

- The SRPs have had a higher share of top 10 publications than the faculties, but the difference is smaller than expected for areas with a special status and resources.
- Most SRPs have broadened their scope during the time when they have existed. This has made them bigger and broader. In many cases their possibility to stand out and be recognized has also decreased, when they have become too broad and inclusive.
- During the first years of the SRPs, several recruitments of tenure track professors were done to strengthen the profiles. There seems to be a broad agreement that the processes through which these recruitments were planned and decided were unclear. At the same time, there is also a broad agreement that most, or maybe all, of these recruitments were very successful. Many of the recruited tenure track professors are now full professors, and they have been

successful in obtaining external funding, publishing and in renewing the research at ÅAU.
- The SRPs have been able to increase their external funding substantially from domestic funders and ÅAU is very dependent on them for obtaining external funding.
- The SRPs are engaged in a lot of international collaboration, but it is mainly based on personal contacts and may thus disappear if one person leaves the university.

7.2 Recommendations for the future development of the SRPs and the research at ÅAU considering the strategy to 2030

In the Profi 5 panel statement, the panel stated, "The panel felt that the selection of four profiling areas was too much for a university the size of ÅAU." Based on the written material and the interviews, we agree with this assessment. The university could in parallel with the SRPs use other means, such as forming networks, or the CoEs founded by the university foundation, to support other groups of researchers.

Most of the SRPs have become broader during the time that they have existed. Two of the profiles report that they think that they have become too broad and lack focus. For example, SfH writes in their self-evaluation: "The SfH PA seem currently to be too broad to make a meaningful mission." They also state: "The major weakness is that excellence is not well enough supported, but the current approach is more geared towards "everybody should get something" leading to severe dilution of potential".

There is a need for a renewed vision for strategic research profiling at ÅAU and to specify the goals of each profile. In their self-evaluation, the Sea writes: "The lack of strategic, long-term vision was particularly visible in the Profi8 application and process, which may have been the starting point for an unsuccessful endeavor; unclear roles, lack of clear leadership, lack of joint vision and strategic direction." During the interview, one SRP stated that "we have no mandate and no resources". The university leadership stressed also many different aims for the strategic research profiles, which were not fully aligned.

The most important resource of any university is the people that work and study at the university. Therefore, one of the most important ways to renew the research is through recruitment. Both the self-evaluation reports and the interviews have established both examples of successful recruitments and specified challenges in relation to recruitments. Universities in Nordic countries can seldom compete with the salaries for full professors offered in the USA or in central Europe. However, the Nordic welfare state offers services that can be very attractive at earlier career stages. In the self-evaluation report of the Sea it is stated that "[t]he main challenge for recruiting is that we usually can offer only temporary and short-term contracts without any guarantee of continuity, and the salary level is low in comparison to other universities and job opportunities". SfH writes: "Two of these very merited applicants were chosen for the positions, but right before accepting them they both got better offers elsewhere and thus ended up not coming." ÅAU will have to decide on a strategy to attract top international researchers and the role that profile areas can play in such a strategy. The university will also have to improve the processes of how the PIs are involved in the recruitment of PhD students and postdoctoral researchers that they will be responsible for and supervise.

Key recommendations for the future with respect to the SRPs to enhancing high quality research at ÅAU:

- There is a need for the university to clarify the aim and role of the SRPs. It is evident that this is now unclear both for many working in the management of the current SRPs as well as for the researchers involved in them.
- There are many goals attached to the profiles: they should promote excellence; they should profile the university; they should cluster the research of the university so that it can be presented to collaborators, and they should be a platform where researchers can meet, get to know each other and create new collaborations. Not all these goals can be achieved with one instrument. There is thus a need to specify and limit the aims of the SRP and to make sure that the aims are mutually aligned.
- The university needs to consider the relationship between the SRPs and the CoEs financed by the ÅAU Foundation. The CoEs receive more resources than the SRPs but being internal they do not automatically have the same status outside the university. The CoEs

might still be even more important for achieving international excellence in research.

- To achieve the strategic goal of the university to have at least two externally recognized excellent research environments by 2030, the university should consider decreasing the number of SRPs. Even much bigger universities cannot handle four profile areas at the same time.
- The university should consider complementing the SRPs with networks that could support individual researchers and small research groups in getting contacts, developing ideas and creating collaborations without having a common aim in a way a SRPs should have.
- The university needs to recognize and support strong emerging research groups also outside, or in the margin, of the current SRPs. The future internationally acknowledged research groups at ÅAU are likely to evolve from these groups.
- For the most successful researchers, it is now mainly a burden to be part of an SRP. The university will need to ensure that there are incentives also for the successful researchers to participate in the profiles, otherwise the quality of the profiles may decrease which could hurt the reputation of ÅAU.
- Each SRP would need a clear vision and scope, which make them special and gives them the possibility to be recognized internationally. The vision needs to be created based on the skills and interests of the PIs and the participating researchers and has to be based on actual research strength.
- If the university wants to achieve its strategic goal to have at least two externally recognized excellent research environments, it will have to open some tenure track positions supporting its strongest research environments.

Key general recommendations for the future for enhancing high quality research at ÅAU:

- The university will have to work on strengthening its recruitments so that there are positions opened that will strengthen the strongest research areas at the university and ensure that these positions are announced broadly and attract enough high-quality applicants. It is

also important to ensure that the PIs are sufficiently involved in hiring PhD students and postdoctoral researchers that they will supervise.

- To achieve the strategic aim of the university to increase the external research funding with 25 %, the university needs to further strengthen the support for applicants for external research funding. This will require actions by departments to identify potential applicants and give them subject-specific support in combination with support by the central administration, especially for EU funding.
- Young researchers will need additional help in seeing potential career paths and recognizing what these paths will require. While providing clarity, it must be ensured that unrealistic expectations about future positions and recruitment possibilities are avoided.
- It is important that the university continues to work with strategic internationalization. Most researchers have individual international collaborations and there are many coauthored publications. This must be the basis for further international collaboration. However, a bit more shared and strategic collaborations could help the university to achieve a greater scientific impact. The CHARM-EU university alliance could be one instrument for more strategic internationalization. In addition, there is a need for the university to encourage and support PhD students, postdoctoral researchers and younger researchers to go abroad for longer periods of time.
- The ÅAU Foundation is a very valuable strategic partner for the university. The university should nurture its relationship with the foundation and ensure that the means provided by the foundation are used for long term strategic purposes to the largest extent possible.
- It is important that ÅAU strengthens its work with research evaluation and monitoring. Monitoring with indicators for publications, citations, funding and personnel, as collected for this evaluation should be done annually. In addition, a qualitative assessment of research in general or specific research areas should also be done with a certain continuity. It is important that the outcomes of the monitoring and evaluations are used as input to systematic work to improve the quality of the research at ÅAU.

Annex 1

Table A1. Success rate in RCF Project applications 2020-24: ÅAU[30]

	Applications submitted					Approved applications					Success rate					
Organization	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	Average
Aalto University	176	179	160	146	168	36	30	23	30	32	20 %	17 %	14 %	21 %	19 %	18 %
University of Helsinki	410	405	345	324	386	81	79	62	65	67	20 %	20 %	18 %	20 %	17 %	19 %
Finnish Meteorological Institute	39	36	49	48	48	<5	7	6	7	9	ND	19 %	12 %	15 %	19 %	16 %
University of Eastern Finland	141	135	144	133	176	25	21	15	25	22	18 %	16 %	10 %	19 %	13 %	15 %
University of Jyväskylä	121	135	123	118	140	14	18	21	22	23	12 %	13 %	17 %	19 %	16 %	15 %
University of Oulu	146	156	167	162	147	14	17	23	25	19	10 %	11 %	14 %	15 %	13 %	13 %
Tampere University	164	188	161	137	159	21	26	37	28	26	13 %	14 %	23 %	20 %	16 %	17 %
VTT Technical Research Centre	65	56	45	41	61	12	5	11	7	12	18 %	9 %	24 %	17 %	20 %	18 %
University of Turku	170	174	182	152	197	31	29	23	19	28	18 %	17 %	13 %	13 %	14 %	15 %
Åbo Akademi University	**40**	**46**	**47**	**46**	**47**	**<5**	**6**	**5**	**6**	**5**	**ND**	**13 %**	**11 %**	**13 %**	**11 %**	**12 %**
Total	1 704	1 747	1 687	1 557	1 818	268	270	258	286	272	16 %	15 %	15 %	18 %	15 %	16 %

[30] Data obtained from "Research Council of Finland funding statistics: winter call 2024". <https://www.aka.fi/globalassets/1-tutkimusrahoitus/2-arviointi-ja-paatoksenteko/5-rahoituspaatokset/aka_funding_statistics_winter_call_2024_web.pdf> (accessed 27 January 2025).

Annex 2: Publications: ÅAU[31]

Table A2. Number of scientific publications (A-C) by JUFO category 0-3

JUFO (1-3)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
3	**69**	**114**	**99**	**102**	**134**	**116**	**117**	**173**	**924**
A1 Journal article-refereed	40	47	52	49	42	52	64	102	448
A2 Review article in a scientific journal		2	3	5	5	2	5	4	26
A3 Part of a book or another research book	19	48	34	28	71	40	38	53	331
A4 Article in a conference publication						1		2	3
B1 Article in a scientific magazine	4	4	1	13	6	9			37
B3 Non-refereed article in conference proceedings				1					1
C1 Separate scientific books	2	6	2	1	1	6	4	3	25
C2 Edited work	4	7	7	5	9	6	6	9	53
2	**232**	**328**	**251**	**284**	**279**	**273**	**252**	**275**	**2174**
A1 Journal article-refereed	173	197	180	197	183	184	174	168	1456
A2 Review article in a scientific journal	5	5	4	5	14	10	10	5	58
A3 Part of a book or another research book	40	80	46	41	53	49	57	81	447
A4 Article in a conference publication		6	6	5	3	3	1	1	25
B1 Article in a scientific magazine	4	26	2	22	20	18			92
B2 Part of a book or another research book				1					1
C1 Separate scientific books	3	1	3	5	3	3	2	1	21
C2 Edited work	7	13	10	8	3	6	8	19	74
1	**529**	**639**	**606**	**710**	**776**	**735**	**610**	**502**	**5107**
A1 Journal article-refereed	425	425	444	495	535	491	474	386	3675
A2 Review article in a scientific journal	11	15	15	31	30	34	37	34	207
A3 Part of a book or another research book	46	37	48	50	40	78	32	39	370
A4 Article in a conference publication	5	48	61	43	56	29	49	31	322
B1 Article in a scientific magazine	19	85	7	63	89	78	3		344
B2 Part of a book or another research book		3	1	1	2				7
B3 Non-refereed article in conference proceedings				1	3				4
C1 Separate scientific books	4	3	7	11	2	4		2	33
C2 Edited work	19	23	23	15	19	21	15	10	145
Total	**830**	**1081**	**956**	**1096**	**1189**	**1124**	**979**	**950**	**8205**

[31] See footnote 5.

Table A3. Share of publications by access type (open/closed)

Number of scientific publications International co-publication (international co-authors)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Yes	522	518	530	609	650	603	612	560	4604
A1 Journal article-refereed	377	372	394	467	487	464	450	409	3420
A2 Review article in a scientific journal	9	16	13	30	32	36	37	38	211
A3 Part of a book or another research book	43	49	41	35	48	35	47	39	337
A4 Article in a conference publication	41	37	41	34	26	22	18	25	244
B1 Article in a scientific magazine	9	12	9	10	30	22	27	17	136
B2 Part of a book or another research book	11	5	9	8	5	7	13	6	64
B3 Non-refereed article in conference proceedings	2			1	2		3	1	9
C1 Separate scientific books	7	1	4	7	4	2	3	2	30
C2 Edited work	23	26	19	17	16	15	14	23	153
No	710	809	716	681	728	673	606	690	5613
A1 Journal article-refereed	339	346	324	302	314	295	296	297	2513
A2 Review article in a scientific journal	8	11	12	14	20	14	17	13	109
A3 Part of a book or another research book	103	154	110	125	136	146	100	163	1037
A4 Article in a conference publication	54	56	59	39	55	24	38	20	345
B1 Article in a scientific magazine	120	139	131	110	113	109	102	124	948
B2 Part of a book or another research book	43	58	37	59	61	47	28	50	383
B3 Non-refereed article in conference proceedings	3	3	2	2	1		1		12
C1 Separate scientific books	11	13	12	12	7	15	4	5	79
C2 Edited work	29	29	29	18	21	23	20	18	187
Total	1232	1327	1246	1290	1378	1276	1218	1250	10217

Table A4. Share of international co-publications

Number of scientific publications Open access (open includes gold, hybrid, self-archived)	Year 201 6	2017	2018	2019	2020	2021	2022	2023	Total
Open	**370**	**521**	**628**	**859**	**1063**	**979**	**995**	**995**	**6410**
A1 Journal article-refereed	194	287	423	584	694	676	670	644	4172
A2 Review article in a scientific journal	5	15	17	36	42	46	51	49	261
A3 Part of a book or another research book	20	35	43	73	103	97	94	119	584
A4 Article in a conference publication	26	22	32	43	64	32	40	32	291
B1 Article in a scientific magazine	73	110	74	86	93	77	93	101	707
B2 Part of a book or another research book	23	23	17	20	44	25	23	26	201
B3 Non-refereed article in conference proceedings	3	2		1	3		2		11
C1 Separate scientific books	3	1	2	2	1	2		2	13
C2 Edited work	23	26	20	14	19	24	22	22	170
Closed	**863**	**806**	**622**	**436**	**315**	**297**	**223**	**256**	**3818**
A1 Journal article-refereed	522	431	297	188	107	83	76	63	1767
A2 Review article in a scientific journal	12	12	8	8	10	4	3	2	59
A3 Part of a book or another research book	126	168	109	88	81	84	53	83	792
A4 Article in a conference publication	69	71	68	30	17	14	16	13	298
B1 Article in a scientific magazine	56	41	66	35	50	54	36	40	378
B2 Part of a book or another research book	32	40	29	47	22	29	18	30	247
B3 Non-refereed article in conference proceedings	2	1	2	2			2	1	10
C1 Separate scientific books	15	13	14	17	10	15	7	5	96
C2 Edited work	29	29	29	21	18	14	12	19	171
Total	**1233**	**1327**	**1250**	**1295**	**1378**	**1276**	**1218**	**1251**	**10228**

Annex 3: Self-evaluation questions sent to the SRPs

Name of profiling area
Director of profiling area
General public description of the profiling area

1. BASIC INFORMATION

1.1 Profile and organization

A. Outline the scientific profile.
B. Provide a concise description of the PA:s organization and composition (leadership and management practices, research groups, disciplines, sub disciplines, joint positions with other organizations).
C. Specify possible national and international tasks, roles and responsibilities of the PA that have an effect, e.g., on its priorities for research targets or resource allocation.
D. Provide a short summary of the PA:s organizational history, including the main changes during the period 2016-2023.
E. Provide a benchmarking of the PA with two or three research environments that are relevant in the field. How would such a benchmarking turn out?

1.2. Key figures: Key indicator information on personnel, funding, publications and other academic achievements

A. Pre-filled table: Key indicator information on personnel, funding and publications (provided by the administration)
B. Information on other academic achievements.
C. List the PA:s s other major academic achievements (e.g. Academy of Finland Flagship and Centres of Excellence, and Academy professors, ERC- and other major EU-funded projects, ÅAU internal CoEs, patents, major awards, open access data, reagents, software, intellectual property and datasets, tasks in national and international academic boards).

1.3. Scientific and social impact

A. Scientific impact. Describe the main scientific achievements of the PA since 2016, e.g. breakthroughs, paradigm shifts, new theories and new methods.

B. Societal impact. Describe the societal impact of the PA. Societal impact may constitute various contributions, e.g., as described in the Academy of Finland's STATE OF SCIENTIFIC RESEARCH IN FINLAND 2016 (see pages 5 – 10). https://www.aka.fi/globalassets/2-suomen-akatemian-toiminta/2-tietoaineistot/aka_tieteen_tila_2016_eng_150317.pdf

Academic staff in the PA annually for the period 2016-2023 (provided by administration)

- Senior Researchers (number of)
- Postdoctoral researchers (number of)
- Doctoral students (number of)
- Principal investigators (number of)
- Title of Docent (number of)

Competed external funding annually for the period 2016-2023 within the PA (provided by administration)

- National funding (€/year)
- International funding (€/year)
- Total funding (€/year)

Scientific publications from PA (no of articles published between 2016 and 2023)

1.4 Recruitment of researchers (provided by administration)

- The amount of research personnel hired to the PA between 2016-2023.
- Number of applicants per recruitment (internal, from Finland and international applicants).
- At what level was the person who was hired (how many do you lose).
- Was the person who got the position from ÅAU, Finland or and international applicant.

2. REFLECTIVE ANALYSES

Section 2 identifies structures and processes that characterize the PA and facilitate high quality research. When applicable, please refer to data aggregated for the PA, bibliometric data, and any other evidence.

You may consider the following questions in relation to each factor:

- How is the PA currently working to achieve high-quality research and renewal?
- What strengths and weakness do you see in the PA:s current performance and approaches?
- In what ways could the PA:s current approach be further improved? Are there any ongoing or planned new initiatives?
- Does the PA need further support (administrative support, removal of administrative barriers, etc.)?

Focus primarily on what is within the PA:s immediate reach and control, i.e., on what can be done – and improved – by the PA itself. In addition, the PA may suggest changes that have to be decided upon – or made – at other levels within the University (e.g. faculty or university level), and/or by external bodies (e.g. changes in government regulations and research council procedures).

2.1. Assessment of the PA:s current output, collaborations and environment

Describe the strategies for publication, competitive funding, collaborations and infrastructures.

2.1.1. Publications – refer to the RAE2024 bibliometric analyses

A. Please provide details on the following: publication strategy, selection of publishing venues, national and international publishing, open access publishing and the follow-up of the development of PA:s publication patterns. How does the PA encourage and facilitate researchers in applying open science principles and practices such as open publishing and making data, material, metadata and methods widely available for re-use?
B. Analysis of bibliometric data. Comment on the PA:s research output based on bibliometric data with regard to productivity, citations, and publication channels. Noticeable changes over time? Potential for improvement?
C. Describe the content of the 4-8 most significant publications and reflect upon their scientific impact.
D. List the 20 most significant publications published between 2016 – 2023.
E. Reflect on the areas in which the PA sees the greatest potential for making significant scientific contributions in the future

2.1.2. Competitive funding

- Describe the PA:s current strategy for obtaining external national and international research funding and the current overall funding situation. What are the PA:s plans to secure a sufficient level of external funding in the future?

2.1.3. Collaborations

A. Collaboration and networks with other universities and research institutes.
B. Which are the PA:s and its groups' most important national and international collaboration partners, and how are they maintained?

Internal collaborations within ÅAU.

- What collaborations are ongoing between the PA and its research groups and other PA:s?
- Describe also internal collaborations within the PA. How will the PA develop these activities further?
- Non-academic collaboration and public outreach activities (See 1.3.).
- What are the PA:s most important collaboration partners outside academia (e.g. companies, municipalities, hospitals)? How is the PA currently working to establish and maintain such collaboration and networks? How does the PA realize wider dissemination of research results to the rest of society? What are the PS:s current approaches to stimulate public outreach activities/knowledge utilization/innovation? How will the PA develop these activities further?

2.1.4. Research infrastructures

- How is the PA currently working to maintain and develop the research infrastructures it needs (e.g., instruments, tools and supplies, support staff)? Does the PA use or contribute to university-level, national or international research infrastructures?
- How does the PA and its research groups manage research data? Suggestions for improvements?

2.2. The PA:s academic culture, structures and processes

In section 2.2., consider how the PA is currently working to nurture a culture that is conducive to high quality research and renewal, e.g., regarding intellectual interaction, collegiality, equal opportunity, creativity, ambition, scientific conduct, research integrity? How do you ensure that all researchers in the PA, including early-stage researchers (doctoral students and postdoctoral

researchers), are well familiarized with and follow the principles of responsible conduct of research, ethical principles, and legislation relating to their research? Suggestions for improvement?

2.2.1. Research leadership

A. Describe how research leadership and communication is organized in the PA, including the roles of individual research group leaders, etc. Suggestions for strengthening research leadership?
B. How do you perceive that the leadership at the faculty/university level works to support high-quality research and renewal? Strengths and weakness of approaches? Suggestions for improvement?

2.2.2. Recruitment

- How do the current recruitment processes aim to ensure high-quality research, renewal and maintaining a critical mass at all stages of the research career in the PA (e.g., attracting top-level researchers and teachers, opening new fields of research and balanced recruitment also from outside ÅAU?)
- Are internal career opportunities aimed at attracting and retaining talented researchers being offered?
- How are equal opportunities of potential applicants ensured?
- Suggestions for improvement?

2.2.3. Career and mobility

- How is the PA currently working to support researchers to sustain their active career paths, to promote career development and to stimulate mobility (researchers in all career stages)?
- What support does the PA offer for international collaboration that might boost career development? How are equal opportunities ensured for all researchers of the PA?
- Suggestions for improvement?

2.2.4. Doctoral education

A. How are doctoral students recruited and selected in the PA? Describe the practices of agreeing on research topics and questions for doctoral thesis work.
B. What is the role of doctoral students in the research of the PA? How do you integrate the doctoral students into the community and

research activities? How do doctoral students receive feedback about their progress?

2.2.5. Research-teaching linkages

- How is the PA currently working to create links between research and teaching in order to improve student learning and research quality? Suggestions for improvement?

2.2.6. Feedback and evaluation in the PA

- How is the PA currently carrying out follow-up and evaluation of the research environment and research outcomes?
- Are individual researchers given formal or informal feedback on their performance?
- Suggestions for improvement?

2.3. Other information

Please state below if there are matters of relevance to research quality and renewal that have not been covered above, i.e. themes at the PA level that are important aspects of the preconditions and processes for high-quality research that are central to the PA.

Annex 4: Programme for the expert panels visit in Åbo

Wednesday 20 November 2024

9.00-10.00	Introductory meeting with the vice-rector for research + staff
10.00-12.00	Organising the work and division of labour among the panel members
12.00-13.00	Lunch
13.00-13.45	Meeting with the Minority research Steering board
13.45-14.30	Meeting with selected researchers and doctoral researchers
15.00-15.45	Meeting with the SEA research Steering board
15.45-16.30	Meeting with selected researchers and doctoral researchers
17.00-18.00	The panel has time to write statements
19-21	Dinner at Radisson Blue Marina Palace

Thursday 21 November 2024

9.00-10.00	The panel reflects on the first day and prepares for the second day
10.00-10.45	Meeting with the TSF Steering board
10.45-11.30	Meeting with selected researchers and doctoral researchers
12.00-13.00	Lunch
13.00-13.45	Meeting with the SfH Steering board
13.45-14.30	Meeting with selected researchers and doctoral researchers
15.00-17.00	The panel has time to write statements All statements should be submitted by 17.00
18.00-20.00	Dinner at ÅAU headquarters

Friday 22 November 2024

9.00-10.30	Meeting with the rectorate
10.45-12.00	Meeting with the deans
12.00-13.00	Lunch at SÅA Observatorium
13.00-14.00	Meeting with the SÅA Foundation

Annex 5: Publications: Minority Research[32]

Table A5. Number of scientific publications (A-C) by JUFO category 0-3

Number of scientific publications	Year								
Jufo (1-3)	2016	2017	2018	2019	2020	2021	2022	2023	Total
3	**11**	**17**	**16**	**15**	**38**	**15**	**20**	**28**	**160**
A1 Journal article-refereed	2	7	2	2	4	4	7	13	41
A2 Review article in a scientific journal			1		1				2
A3 Part of a book or another research book	7	7	12	9	29	7	10	11	92
B1 Article in a scientific magazine				3	1	1			5
C1 Separate scientific books	1	2	1			2		1	7
C2 Edited work	1	1		1	3	1	3	3	13
2	**19**	**31**	**27**	**30**	**36**	**40**	**37**	**52**	**272**
A1 Journal article-refereed	14	18	21	17	20	25	14	26	155
A2 Review article in a scientific journal	1				1			1	3
A3 Part of a book or another research book	2	6	5	9	11	13	20	16	82
A4 Article in a conference publication					1				1
B1 Article in a scientific magazine		4		3	3	1			11
B2 Part of a book or another research book				1					1
C1 Separate scientific books		1						1	2
C2 Edited work	2	2	1			1	3	8	17
1	**33**	**59**	**49**	**52**	**69**	**63**	**60**	**57**	**442**
A1 Journal article-refereed	21	35	31	37	43	42	41	48	298
A2 Review article in a scientific journal		3		3	1	4	3	2	16
A3 Part of a book or another research book	4	4	5	1	5	5	7	5	36
A4 Article in a conference publication		2	7	2	5	2	2	1	21
B1 Article in a scientific magazine	1	9		4	10	6			30
B2 Part of a book or another research book		1							1
C1 Separate scientific books		1	3	2		1			7
C2 Edited work	7	4	3	3	5	3	7	1	33
Total	**63**	**107**	**92**	**97**	**143**	**118**	**117**	**137**	**874**

[32] See footnote 5.

Table A6. Share of publications by access type (open/closed)

Number of scientific publications Open access (open includes gold, hybrid, self-archived)	Year 2016	2017	2018	2019	2020		2021	2022	2023	Total
Open		**50**	**62**	**63**	**94**	**143**	**111**	**124**	**152**	**799**
A1 Journal article-refereed		25	32	34	51	64	67	56	89	418
A2 Review article in a scientific journal			1		4	2	4	3	3	17
A3 Part of a book or another research book		3	6	10	14	35	19	33	27	147
A4 Article in a conference publication		3		3	2	7	2	2	2	21
B1 Article in a scientific magazine		12	16	9	12	14	12	16	11	102
B2 Part of a book or another research book		3	3	4	8	16	2	5	11	52
B3 Non-refereed article in conference proceedings		1								1
C1 Separate scientific books									1	1
C2 Edited work		3	4	3	3	5	5	9	8	40
Closed		**61**	**69**	**61**	**30**	**29**	**22**	**24**	**28**	**324**
A1 Journal article-refereed		26	34	23	7	5	6	6	4	111
A2 Review article in a scientific journal		1	2	1	1	1				6
A3 Part of a book or another research book		16	16	14	11	15	10	7	9	98
A4 Article in a conference publication		2	2	5	1					10
B1 Article in a scientific magazine		2	3	5	2	3	1	4	5	25
B2 Part of a book or another research book		4	3	7	4		1	3	4	26
C1 Separate scientific books		1	5	4	2	1	3		1	17
C2 Edited work		9	4	2	2	4	1	4	5	31
Total		**111**	**131**	**124**	**124**	**172**	**133**	**148**	**180**	**1123**

Table A7. Share of international co-publications

Number of scientific publications International co-publication (international co-authors)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Yes	**36**	**36**	**48**	**51**	**65**	**46**	**57**	**63**	**402**
A1 Journal article-refereed	18	23	23	33	31	32	25	37	222
A2 Review article in a scientific journal	1		1	4	1	2		3	12
A3 Part of a book or another research book	8	4	7	7	19	5	18	8	76
A4 Article in a conference publication	3	2	2					1	8
B1 Article in a scientific magazine	1	2	2		5	2	4	4	20
B2 Part of a book or another research book	1		7	2	1	2	2	1	16
C1 Separate scientific books		1	3	2	1	1			8
C2 Edited work	4	4	3	3	7	2	8	9	40
No	**75**	**95**	**74**	**73**	**107**	**87**	**91**	**117**	**719**
A1 Journal article-refereed	33	43	33	25	38	41	37	56	306
A2 Review article in a scientific journal		3		1	2	2	3		11
A3 Part of a book or another research book	11	18	17	18	31	24	22	28	169
A4 Article in a conference publication	2		6	3	7	2	2	1	23
B1 Article in a scientific magazine	13	17	12	14	12	11	16	12	107
B2 Part of a book or another research book	6	6	4	10	15	1	6	14	62
B3 Non-refereed article in conference proceedings	1								1
C1 Separate scientific books	1	4	1			2		2	10
C2 Edited work	8	4	1	2	2	4	5	4	30
Total	**111**	**131**	**122**	**124**	**172**	**133**	**148**	**180**	**1121**

Annex 6: Publications: Solutions for Health[33]

Table A8. Number of scientific publications (A-C) by JUFO category 0-3

Number of scientific publications Jufo (1-3)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
3	**19**	**23**	**24**	**25**	**11**	**18**	**27**	**39**	**186**
A1 Journal article-refereed	18	18	20	18	10	16	25	35	160
A2 Review article in a scientific journal		1	3	5	1	1	1	3	15
A3 Part of a book or another research book	1	3		2			1		7
B1 Article in a scientific magazine			1			1			2
C1 Separate scientific books								1	1
C2 Edited work		1							1
2	**68**	**94**	**77**	**72**	**73**	**62**	**60**	**51**	**557**
A1 Journal article-refereed	60	74	70	61	58	53	44	47	467
A2 Review article in a scientific journal	3	2	1	2	10	4	8	1	31
A3 Part of a book or another research book	5	16	5	5	5	3	8	3	50
A4 Article in a conference publication			1						1
B1 Article in a scientific magazine				3		1			4
C1 Separate scientific books						1			1
C2 Edited work		2		1					3
1	**126**	**155**	**141**	**187**	**219**	**198**	**196**	**153**	**1375**
A1 Journal article-refereed	116	139	126	156	189	163	172	124	1185
A2 Review article in a scientific journal	5	9	9	13	19	22	15	20	112
A3 Part of a book or another research book	3	2	3	5	3	4	4	4	28
A4 Article in a conference publication	1		3	6	1	1	5	5	22
B1 Article in a scientific magazine	1	5		6	7	7			26
C2 Edited work				1		1			2
Total	**213**	**272**	**242**	**284**	**303**	**278**	**283**	**243**	**2118**

Table A9. Share of publications by access type (open/closed)

Number of scientific publications Open access (open includes gold, hybrid, self-archived)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Open	**61**	**122**	**145**	**211**	**271**	**260**	**273**	**253**	**1596**
A1 Journal article-refereed	56	104	131	181	228	212	232	208	1352
A2 Review article in a scientific journal	2	9	9	18	25	28	26	31	148
A3 Part of a book or another research book		2	2	2	2	5	7	3	23
A4 Article in a conference publication	2	3	2	2	2	1	3	1	16
B1 Article in a scientific magazine	1	4	1	8	14	11	5	10	54
B2 Part of a book or another research book						1			1
C2 Edited work						2			2
Closed	**189**	**179**	**111**	**106**	**52**	**41**	**32**	**29**	**739**
A1 Journal article-refereed	162	139	89	62	36	28	20	14	550
A2 Review article in a scientific journal	6	5	6	3	7	1		1	29
A3 Part of a book or another research book	12	20	6	11	7	4	7	5	72
A4 Article in a conference publication	5	4	7	12	1	3	4	4	40
B1 Article in a scientific magazine	3	3	3	2	1	4	1	3	20
B2 Part of a book or another research book		4		13				1	18
C1 Separate scientific books						1		1	2
C2 Edited work	1	4		3					8
Total	**250**	**301**	**256**	**317**	**323**	**301**	**305**	**282**	**2335**

[33] See footnote 5.

Table A10. Share of international co-publications

Number of scientific publications International co-publication (international co-authors)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Yes	**157**	**189**	**163**	**214**	**235**	**213**	**210**	**194**	**1575**
A1 Journal article-refereed	144	155	147	177	202	174	174	155	1328
A2 Review article in a scientific journal	4	10	8	14	19	24	17	25	121
A3 Part of a book or another research book	4	9	2	4	5	4	8	4	40
A4 Article in a conference publication	4	6	5	12		3	5	2	37
B1 Article in a scientific magazine	1	6	1	5	9	6	6	7	41
B2 Part of a book or another research book		1				1			2
C1 Separate scientific books								1	1
C2 Edited work		2		2		1			5
No	**93**	**112**	**93**	**102**	**88**	**88**	**95**	**87**	**758**
A1 Journal article-refereed	74	88	73	65	62	66	78	66	572
A2 Review article in a scientific journal	4	4	7	7	13	5	9	7	56
A3 Part of a book or another research book	8	13	6	9	4	5	6	4	55
A4 Article in a conference publication	3	1	4	2	3	1	2	3	19
B1 Article in a scientific magazine	3	1	3	5	6	9		6	33
B2 Part of a book or another research book		3		13				1	17
C1 Separate scientific books						1			1
C2 Edited work	1	2		1		1			5
Total	**250**	**301**	**256**	**316**	**323**	**301**	**305**	**281**	**2333**

Annex 7: Publications: Technologies for a Sustainable Future[34]

Table A11. Number of scientific publications (A-C) by JUFO category 0-3

Number of scientific publications	Year								
Jufo (1-3)	2016	2017	2018	2019	2020	2021	2022	2023	Total
3	**9**	**20**	**17**	**21**	**16**	**21**	**25**	**29**	**158**
A1 Journal article-refereed	9	10	16	21	13	17	22	26	134
A2 Review article in a scientific journal					1		1	3	5
A3 Part of a book or another research book		9			1	3	1		14
A4 Article in a conference publication						1			1
C1 Separate scientific books			1		1		1		3
C2 Edited work		1							1
2	**63**	**61**	**62**	**59**	**60**	**71**	**70**	**55**	**501**
A1 Journal article-refereed	52	49	52	53	49	60	62	52	429
A2 Review article in a scientific journal	1	3	1	2	8	6	3	1	25
A3 Part of a book or another research book	7	6	7	3	3	5	5	2	38
A4 Article in a conference publication		2	1						3
B1 Article in a scientific magazine	1		1						2
C1 Separate scientific books	1			1					2
C2 Edited work	1	1							2
1	**135**	**107**	**119**	**166**	**193**	**177**	**161**	**135**	**1193**
A1 Journal article-refereed	130	97	108	143	166	155	136	117	1052
A2 Review article in a scientific journal	3	3	4	6	10	9	11	7	53
A3 Part of a book or another research book	1	1	2	1	2	1		3	11
A4 Article in a conference publication		5	5	12	8	2	12	8	52
B1 Article in a scientific magazine		1		2	7	10	2		22
B3 Non-refereed article in conference proceedings				1					1
C1 Separate scientific books	1			1					2
Total	**207**	**188**	**198**	**246**	**269**	**269**	**256**	**219**	**1852**

[34] See footnote 5.

Table A12. Share of publications by access type (open/closed)

Number of scientific publications Open access (open includes gold, hybrid, self-archived)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Open	**24**	**46**	**94**	**185**	**243**	**240**	**233**	**200**	**1265**
A1 Journal article-refereed	20	35	88	166	204	204	201	175	1093
A2 Review article in a scientific journal		3	4	4	17	15	12	12	67
A3 Part of a book or another research book			1	4	3	4	2	1	15
A4 Article in a conference publication	3	8	1	9	11	9	8	8	57
B1 Article in a scientific magazine	1			2	8	8	8	4	31
B3 Non-refereed article in conference proceedings							1		1
C2 Edited work							1		1
Closed	**220**	**178**	**130**	**87**	**46**	**47**	**46**	**40**	**794**
A1 Journal article-refereed	177	126	94	58	31	31	27	28	572
A2 Review article in a scientific journal	4	3	1	4	3	2	3	1	21
A3 Part of a book or another research book	8	19	8	8	5	5	6	4	63
A4 Article in a conference publication	21	26	23	13	5	4	6	5	103
B1 Article in a scientific magazine	4	1	1			2	2		10
B2 Part of a book or another research book			1			1		1	3
B3 Non-refereed article in conference proceedings			1	1					2
C1 Separate scientific books	2		1	2	1		1		7
C2 Edited work	4	3		1	1	2	1	1	13
Total	**244**	**224**	**224**	**272**	**289**	**287**	**279**	**240**	**2059**

Table A13. Share of international co-publications

Number of scientific publications International co-publication (international co-authors)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Yes	**139**	**117**	**137**	**191**	**215**	**213**	**200**	**178**	**1390**
A1 Journal article-refereed	123	98	126	161	179	181	163	152	1183
A2 Review article in a scientific journal	2	3	1	6	15	12	12	8	59
A3 Part of a book or another research book	2	4	3	6	6	5	5	3	34
A4 Article in a conference publication	7	10	5	14	7	7	7	10	67
B1 Article in a scientific magazine	2		1	2	6	6	10	3	30
B2 Part of a book or another research book			1					1	2
B3 Non-refereed article in conference proceedings							1		1
C1 Separate scientific books	1			1	1				3
C2 Edited work	2	2		1	1	2	2	1	11
No	**105**	**107**	**87**	**81**	**74**	**74**	**79**	**61**	**668**
A1 Journal article-refereed	74	63	56	63	56	54	65	50	481
A2 Review article in a scientific journal	2	3	4	2	5	5	3	5	29
A3 Part of a book or another research book	6	15	6	6	2	4	3	2	44
A4 Article in a conference publication	17	24	19	8	9	6	7	3	93
B1 Article in a scientific magazine	3	1			2	4		1	11
B2 Part of a book or another research book						1			1
B3 Non-refereed article in conference proceedings			1	1					2
C1 Separate scientific books	1		1	1			1		4
C2 Edited work	2	1							3
Total	**244**	**224**	**224**	**272**	**289**	**287**	**279**	**239**	**2058**

Annex 8: Publications: The Sea[35]

Table A14. Number of scientific publications (A-C) by JUFO category 0-3

Number of scientific publications	Year								
Jufo (1-3)	2016	2017	2018	2019	2020	2021	2022	2023	Total
3	**4**	**14**	**1**	**4**	**13**	**7**	**11**	**6**	**60**
A1 Journal article-refereed	4								25
A2 Review article in a scientific journal		1					1		2
A3 Part of a book or another research book		10		2	7	4	6	1	30
C2 Edited work		1		1	1				3
2	**7**	**6**	**8**	**9**	**18**	**15**	**13**	**16**	**92**
A1 Journal article-refereed	6	4	5	6	9	14	7	3	54
A2 Review article in a scientific journal					1			1	2
A3 Part of a book or another research book	1	2	2	2	6	1	5	10	29
B1 Article in a scientific magazine					1				1
C1 Separate scientific books				1					1
C2 Edited work			1		1		1	2	5
1	**18**	**23**	**30**	**25**	**30**	**26**	**32**	**23**	**207**
A1 Journal article-refereed	17	21	25	21	24	24	27	13	172
A2 Review article in a scientific journal			1	3			5		9
A3 Part of a book or another research book	1	1	3		3			6	14
A4 Article in a conference publication					2			3	5
B1 Article in a scientific magazine		1		1		2			4
C2 Edited work			1		1			1	3
Total	**29**	**43**	**39**	**38**	**61**	**48**	**56**	**45**	**359**

Table A15. Share of publications by access type (open/closed)

Number of scientific publications	Year								
Open access (open includes gold, hybrid, self-archived)	2016	2017	2018	2019	2020	2021	2022	2023	Total
Open	**17**	**14**	**25**	**33**	**43**	**45**	**55**	**38**	**270**
A1 Journal article-refereed	12	11	21	27	32	39	38	21	201
A2 Review article in a scientific journal		1	1	3	1		6	2	14
A3 Part of a book or another research book	1		2	1	6	1	6	8	25
A4 Article in a conference publication	1				1			4	6
B1 Article in a scientific magazine	2	1		2	2	4	5	2	18
B2 Part of a book or another research book	1		1		1	1		1	5
C1 Separate scientific books		1							1
Closed	**19**	**34**	**20**	**6**	**25**	**8**	**7**	**14**	**133**
A1 Journal article-refereed	17	16	13	1	8	2	1		58
A2 Review article in a scientific journal		1							1
A3 Part of a book or another research book	2	15	5	3	11	5	5	9	55
A4 Article in a conference publication					2			1	3
B1 Article in a scientific magazine		1			1			1	3
B2 Part of a book or another research book						1			1
C1 Separate scientific books				1					1
C2 Edited work		1	2	1	3		1	3	11
Total	**36**	**48**	**45**	**39**	**68**	**53**	**62**	**52**	**403**

[35] See footnote 5.

Table A16. Share of international co-publications

Number of scientific publications International co-publication (international co-authors)	Year 2016	2017	2018	2019	2020	2021	2022	2023	Total
Yes	**22**	**20**	**17**	**22**	**31**	**33**	**40**	**25**	**210**
A1 Journal article-refereed	20	13	15	16	27	30	30	14	165
A2 Review article in a scientific journal		2	1	3	1		4	2	13
A3 Part of a book or another research book	2	5	1	1		3	4	4	20
A4 Article in a conference publication					2			3	5
B1 Article in a scientific magazine							1		1
C1 Separate scientific books				1					1
C2 Edited work				1	1		1	2	5
No	**14**	**28**	**28**	**17**	**37**	**20**	**22**	**27**	**193**
A1 Journal article-refereed	9	14	19	12	13	11	9	7	94
A2 Review article in a scientific journal							2		2
A3 Part of a book or another research book	1	10	6	3	17	3	7	13	60
A4 Article in a conference publication	1				1			2	4
B1 Article in a scientific magazine	2	2		2	3	4	4	3	20
B2 Part of a book or another research book	1		1		1	2		1	6
C1 Separate scientific books		1							1
C2 Edited work		1	2		2			1	6
Total	**36**	**48**	**45**	**39**	**68**	**53**	**62**	**52**	**403**

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