Template 4 for GREP 2027: SEP Indicators and Dimensions

The Strategy Evaluation Protocol 2027-2033 no longer provides more detailed guidelines for indicators that can be used to demonstrate academic quality or societal impact. Because the previous SEP guidelines are still considered useful, we here copied Appendices E1-E2 from Appendix E: Merits and metrics from the SEP 2021-2027 (pages 34-39). Only the references to the old SEP Tables and Appendices have been updated to their equivalents in the current SEP.

The SEP is a flexible instrument that stands in the service of a valuable conversation on the research quality, societal relevance as well as viability of research units in light of their own aims and strategy. The protocol leaves room for plurality with respect to the application and interpretation of the different elements, depending on the institutional context, the discipline or field of the research and the nature of the unit, among other things.

5a: Indicators, quality domains and assessment dimensions

In the self-evaluation, the unit reflects on its ambitions and strategy during the previous six years as well as for the future in a coherent, narrative argument, supported wherever possible with factual evidence. This fact means that there should be a direct relationship between the arguments with regard to the aims and strategy on the one hand and the type of robust data underpinning the self-evaluation on the other. Where appropriate, the unit can use quantitative indicators of research activity, progress and impact. Some indicators may also be useful to underpin the case studies. The research unit should take into account that it is not allowed to use the Journal Impact Factor in a SEP evaluation. The Journal Impact Factor was not created as a measure of the scientific quality of research in an article. It has a number a number of well-documented deficiencies as a tool for research assessment[1]. The use of the h-index is advised against because 1) it is sensitive to age and experience (so young scholars always have low h-index values), 2) it is not field-normalised, which makes comparison across fields – sometimes even within fields – based on the h-index impossible and 3) it is an author-level metric, while SEP assessments evaluate research units.

The categories of evidence are classified according to three assessment dimensions in the domain of both research quality and relevance to society. This classification results in the following table.

Table 5a: Categories of evidence for quality domains research quality and societal relevance

		Quality domains	
		Research quality	**Relevance to society**
Assessment dimensions	**Demonstrable products**	1. Research products for peers	4. Research products for societal target groups
	Demonstrable use of products	2. Use of research products by peers	5. Use of research products by societal target groups
	Demonstrable marks of recognition	3. Marks of recognition from peers	6. Marks of recognition by societal target groups

Below, a few types of evidence for each of the six cells are defined and described; **by way of example, since units may choose other forms of data and indicators.**

[1] San Francisco Declaration on Research Assessment: https://sfdora.org/read/

In selecting the data and indicators, its definitions and registration methods, the research unit has to adhere to the internal agreements within its institution and/or within the research fields. This requirement means the following:
University units adhere to the internal agreements at their university (and within their research field).
KNAW and NWO institutes adhere to the internal agreements at KNAW and NWO, respectively (and within their research field).

As a result, the research unit selects one or more – but not too many – indicators per cell which are the most appropriate to highlight its profile as well as strategic decisions and which are compatible with the existing agreements. In the self-evaluation, research units explain the choice of the indicators as well as their link to the unit's aims and strategy.

In the narrative, the general results of the past six years – based on the selected evidence – should be described. Where applicable, the research unit presents quantitative evidence (in the shape of figures, in a table or figure) and one or more case studies. Template 5b presents a list of possible indicators and their use; by way of example, since units may choose other forms of data and indicators**.** Instructions for setting up a case study can be found in SEP Appendix D1.

Finally, some quantitative material should be included in all self-evaluation reports (or their appendices), with quantitative information on the Input of research staff (Table C1 of SEP Appendix C), Funding (Table C2) and PhD candidates (Table C3). The exact shape of these tables may vary, as long as they present the data clearly and orderly.

5b: List of possible indicators and their use

1. Research products for peers

This category of indicators relates to products based on research and intended mainly for fellow researchers in one's own and/or another subject area, including an interdisciplinary research field.

The self-evaluation contains a short text highlighting the most relevant products, such as the most relevant publications (leading to a scientific breakthrough), the organisation of important conferences or other results. The argument may be supported by a case study (SEP Appendix D1) and/or quantitative data.

Some examples

a. (Open access) Journal articles and reviews (refereed/non-refereed)
Description: an article written by one or more authors about a specific theme or idea and based on research, which appears in a journal that is regarded as very important for communication between researchers. This category includes reviews, defined here as critical appraisals that place what are often multiple research products such as books, edited volumes or exhibitions in a broader context while referencing other products.

b. (Open access) Books, source publications and exhibition catalogues (refereed/non-refereed)
Description: a monograph written by one or more authors about a specific theme or idea and based on research, or a critical source publication or catalogue, published by a publisher or museum that is regarded as very important for communication between researchers.

c. (Open access) Book chapter (refereed/ non-refereed)
Description: a text written by one or more authors about a specific theme or idea and based on research, which they have contributed to a book or edited volume published by a publisher that is regarded as very important for communication between researchers.

d. Editorship of volumes and special issues (refereed/non-refereed)
Description: the editorship of an edited volume published by a publisher that is regarded as very important for communication between researchers, or a theme or special issue of a journal that is regarded as very important for communication between researchers.

e. Digital infrastructures and databases
Description: a digital object arising in the context of research, produced by one or more researchers and regarded as important for communication between researchers. This category includes digital supplementary material for articles or books.

f. Presentations and conference proceedings (refereed/non-refereed)
Description: proceedings are collections of research papers presented at a conference, usually distributed in print or digitally, or published in connection with a conference, which are written by one or more authors about a specific theme or idea and based on research, the conference in question being regarded as important for the communication between researchers.
Presentations at conferences, as well as at colloquia, seminars, topical schools, etc., are also a mechanism to disseminate knowledge.

g. Designs
Description: this indicator refers to designs conceived of as documented and scientifically argued propositions (in text, visuals or tangible objects, or in the form of a simulation) that can be verified, criticised and refuted. The purpose of such a design is to conceive and develop solutions systematically in a wide variety of domains, from architecture to restoration and from educational theory to sociology, focusing on interventions and their effects.

h. Data sets and software
Description: the collected research data are organised and classified so they can be verified as well as reused. Making relevant data fully FAIR (Findable, Accessible, Interoperable and Reusable) as well as open wherever viable (duly respecting the constraints of privacy, sensitivity and intellectual property rights) is a way of opening up the research to other researchers and societal stakeholders. The adage 'as open as possible, as closed as necessary' is valid here. Sharing software and code that the unit has developed is an important element not only in making research verifiable but also in making it easy for others to reuse.

Other possible indicators: research materials, instruments, infrastructure, websites, lectures delivered at research conferences, organisation of scientific conferences, films, commissioned reports, annotations.

2. Use of research products by peers

The aim of the indicators in this cell is to make the use of the results of scientific research by other researchers visible. Such use commonly, but not always, becomes visible in the shape of references. It may overlap with the indicators in Cell 5, so it is necessary to make a choice.

In the main narrative, the most relevant use of research products is highlighted; for example, in terms of the most used data sets, the use of infrastructure, the most cited publication(s) or the most relevant collaborations. The text may be supported by a case study (SEP Appendix D1) and/or quantitative data.

Some examples

a. Reviews
Description: reviews are independent expositions examining the key research outputs (e.g. books, edited volumes, exhibitions and other research outputs), published in the scientific/scholarly literature.

b. Use of data sets, software and facilities
Description: databases, software and physical research facilities are digital as well as physical collections and environments of importance to scientific/scholarly research.

c. Citations of articles, books and other products
Description: citations are explicit references in scientific/scholarly literature (books, edited volumes, journals, scientific forums) to research products or outputs.

3. Marks of recognition from peers

This category relates to the recognition of scientific quality, granted to individual members or to part or all of the research units, based on the opinion of fellow researchers.

The self-evaluation contains a short text highlighting the most relevant marks of recognition, such as important individual prices or awards, as well as important collaborative grants (with a value

description, referencing SEP Table C2 or positions of scientific importance held in research collaborations, for example.
The text may be supported by a case study (SEP Appendix D1).

Some examples

a. Research grants awarded to individuals
Description: this indicator pertains to grants awarded by research institutions to individual researchers in recognition of what peers consider outstanding achievement, such as the individual NWO and ERC grants, Spinoza, Marie Curie, Aspasia and Rubicon.

b. Grants awarded to major collaborative research projects
Description: this indicator pertains to funds awarded to research projects under the EU's Horizon 2020 programme, NWO's Gravitation programme and the NWO Large programme, in which researchers affiliated with the research unit act as principal applicant/investigator or as lead partner.

c. Grants awarded to individuals or collaborative research projects
Description: this indicator pertains to funds awarded to research projects by research funds and institutions other than grants under (a) and (b), in which researchers affiliated with the research unit act as principal applicant/investigator or lead partner.

d. Prizes awarded to individuals or collaborative research projects
Description: prestigious research prizes that are not connected to research grants, such as the Nobel Prize, Breakthrough Prize, Abel Prize, Fields Medal, research prizes by learned societies, etc.

e. Secondary appointments and membership of prestigious scientific councils or committees
Description: this indicator pertains to secondary, regular appointments at other research institutions and to membership of prestigious scientific councils or advisory committees

4. Research products for societal target groups

The indicators in this cell relate to the results of scientific research which are primarily aimed at specific social target groups or a general public. These results, or products, fall into two main categories: professional products (for specific social target groups in the fields related to the research area) and popularising products (for a broader audience).

In the main narrative, the most relevant products are mentioned; for example, the most relevant publications (leading to policy change, guideline adjustment, etc.) or important public engagement activities. The text may be supported by a case study or quantitative data.

Some examples in the subcategory of professional products

a. Books, source publications, guidelines, and catalogues for a professional readership
Description: a monograph written by one or more authors about a specific theme or idea and based on research, medical guidelines, or a critical source publication or catalogue, which is intended for specific societal groups active in fields of work related to the research field (including educational books).

b. Patents and licences
Description: the first submission or priority application for the possible acquisition of the exclusive right granted by the government or competent authority to make or sell an industrial product.

c. Films, documentaries and exhibitions for a professional audience
Description: a film, documentary, exhibition or other audio-visual product focusing on a specific theme or idea and based on research, which is meant to be viewed by specific societal groups active in fields of work related to the research field and which is made by one or more researchers or to which one or more researchers have made a demonstrable contribution.

d. Websites for professional visitors
Description: professional websites are collections of interrelated web pages presenting data (for example, text, images or videos) based on research and created by one or more researchers, which are meant for specific societal groups active in fields of work related to the research field. Such websites may also provide supplementary material for articles or books.

Some examples in the subcategory of popularising products

e. Book chapters in publications for a general readership
Description: a text in printed or digital format, written by one or more authors and based on research, which is published in a popular science book or edited volume intended for a general readership.

f. Software, digital media and serious games for general users
Description: science software includes operating systems and applications, procedures as well as accompanying documentation based on scientific insights, which are meant for a group of general users.

g. Lectures, masterclasses and conferences for a general audience
Description: lectures, masterclasses or conferences based on scientific insights by one or more researchers, which are meant for a general audience.

h. Blogs and forums for general readers
Description: a digital, interactive publication channel run by one or more researchers, whether or not in cooperation with general organisations, which is meant for general users.

Other possible indicators: performance for TV, radio or in other public media and organisation of or contribution to an event.

5. Use of research products by societal target groups

The aim of the indicators in this cell is to make the use of the results of scientific research by social target groups visible. This category involves a wide variety of demonstrable uses of academic research products by social institutions, companies and governments, as well as by practitioners, teachers, media users and other social groups. It may overlap with the indicators in Cell 2, so it is necessary to make a choice.

The self-evaluation may point to the most relevant use of research products, such as the use of data sets and the use of patents/licences, or the most relevant national and international collaborations (with a clear description of their added value). The text may be supported by a case study (Appendix D1) and/or quantitative data.

Some examples

a. Projects in cooperation with societal parties
Description: this indicator pertains to interactions between the academic world and societal groups.

b. Contract research
Description: this indicator pertains to research funding and is associated with the indicators 'Projects in cooperation with societal parties' (see 5a. above) and 'Use of data sets, software and facilities' (see 2b. above).

c. Use in education
Description: this indicator group pertains to the teaching-research nexus (where applicable) as well as the use or impact of research in primary, secondary and tertiary education (outside the unit's own institution).

d. References in professional and public domains
Description: references are explicit references in professional and general books, edited volumes, magazines, forums, debates, on websites and other media, to research products or outputs.

6. Marks of recognition from societal target groups

This category of indicators refers to the evidence of recognition granted to researchers by private or public social institutions. This recognition can be provided for purely scientific achievements, but it will usually be for good scientific work that also has a recognisable social value.

In the main narrative, the most relevant marks of recognition from societal target groups are mentioned, highlighting important awards or means of support as well as important collaborative grants (with a value description); for example, with reference to SEP Table C2. The argument may be supported by a case study (SEP Appendix D1).

Some examples

a. Financial and material support by society
Description: this indicator pertains to funding and material resources allocated to research projects and researchers by civil-society funds, organisations as well as institutions.

b. Membership of civil-society organisations
Description: this indicator pertains to membership of prominent councils, boards and advisory committees which have a demonstrable relationship to the research performed, both in the professional and in the general societal domain

c. Secondary appointments within civil-society organisations
Description: this indicator pertains to part-time, externally funded appointments of researchers within organisations and institutions which have a demonstrable relationship to the research performed, in both the professional and the general societal domain.

d. Public prizes
Description: this indicator pertains to non-academic marks of recognition for scientific achievements, in the shape of prizes.