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BRAIN-be 2.0

BELGIAN RESEARCH ACTION THROUGH INTERDISCIPLINARY NETWORKS
PHASE 2 - 2018-2023

Call for proposals 2020-2021
Information File

Pillar 2: Heritage science

*(**Pillars 1 & 3:** foreseen later in spring 2020)*

Submission deadlines:

EoI: Tuesday 19 May 2020 at 14h00
Full proposals: Tuesday 30 June 2020 at 14h00

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PART I: GENERAL INFORMATION ON THE PROGRAMME

1. MULTI-YEAR FRAMEWORK PROGRAMME FOR RESEARCH - BRAIN-BE 2.0

For more information on the programme, please visit https://www.belspo.be/brain-be.

1.1. GENERAL

On 7 September 2018, the Council of Ministers approved the implementation of the second phase of the BRAIN-be (Belgian Research Action through Interdisciplinary Networks) research programme, to be carried out under the responsibility of the Federal Science Policy (BELSPO).

Through the funding of research projects based on scientific excellence and European and international anchorage, this framework programme allows supporting the scientific potential of the Federal Scientific Institutions[1] (FSIs - see **Annex 1**) and meeting the scientific knowledge needs of the FSIs and Federal Departments' (list Federal Departments see **Annex 2**).

The general objectives of the programme are the following:

- Support and strengthen scientific excellence in the FSIs;
- Promote access to the scientific potential, infrastructures and collections available in the FSIs;
- Align the research potential with societal needs;
- Provide the scientific knowledge necessary for the preparation, implementation and evaluation of federal policies/federal strategies, in particular those on transversal themes in multiple departments;
- Provide the scientific support needed to formulate a Belgian position in the various international policy development fora;
- Develop and realise a critical research mass on themes considered to be a priority in order to strengthen the impact of federal research;
- Encourage the participation of highly qualified Belgian scientists in relevant European or transnational and international research activities;
- Promote systemic, multidisciplinary/interdisciplinary and integrative approaches;
- Create added value by strengthening complementarity and synergies between activities of BELSPO (including contributions to international infrastructures and organisations);
- Contribute to strengthening the research identified as a priority for the implementation of the International commitments subscribed by Belgium;
- Strengthen transdisciplinary research in order to enable potential users to make better use of the research achievements
- Promote equality between men and women in research.

BRAIN-be 2.0 is open to the whole Belgian scientific community: universities, colleges of higher education, public scientific institutions and non-profit research centres.

[1] The acronym FSI covers the institutions as defined in the Royal Decree of 30 October 1996 and their possible legal successors, such as Sciensano.

1.2. ORGANISATION

For its operationalisation BELSPO is assisted by three Advisory Committees and three Strategic Committees (one per pillar).

The Advisory Committees are multidisciplinary and independent panels established for the duration of the programme.

The Strategic Committees are composed of members from the federal departments and/or FSIs for the duration of the programme.

The composition of these committees is available on the BRAIN-be 2.0 website:

- https://www.belspo.be/belspo/brain2-be/program_en.stm
- https://www.belspo.be/belspo/brain2-be/program_fr.stm
- https://www.belspo.be/belspo/brain2-be/program_nl.stm

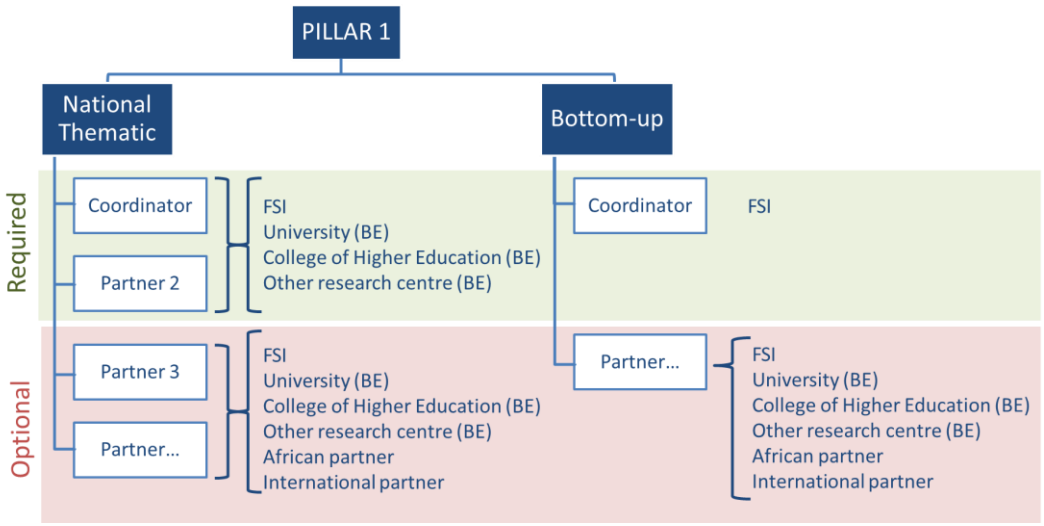
1.3. STRUCTURE

The framework programme is structured around **3 Pillars**:

- Pillar 1: Challenges and knowledge of the living and non-living world
- Pillar 2: Heritage science
- Pillar 3: Federal societal challenges

1.3.1. PILLAR 1: CHALLENGES AND KNOWLEDGE OF THE LIVING AND NON-LIVING WORLD

The implementation of this pillar is done both via **thematic and bottom-up projects**.



PILLAR 1 A: THEMATIC PART

Pillar 1A contributes to the development of the necessary knowledge to support the decisions to be taken by the federal government in the short, medium and long term in order to cope with global change. The aim of pillar 1A is to respond to the research priorities identified at the European and international level such as H2020, Belmont Forum, IPCC, IPBES, EMB, SCAR, the strategic agendas of the JPIs in which BELSPO participates... These research challenges are guided by the international commitments that Belgium has endorsed (CBD, SDG-2030, the climate convention and the Paris agreement, the Antarctic Treaty, OSPAR).

They cover, inter alia, the research in support of mitigation and adaptation to climate change, the protection of biodiversity and ecosystem services, the protection of the natural environment, natural risks, and the sustainable exploitation of resources.

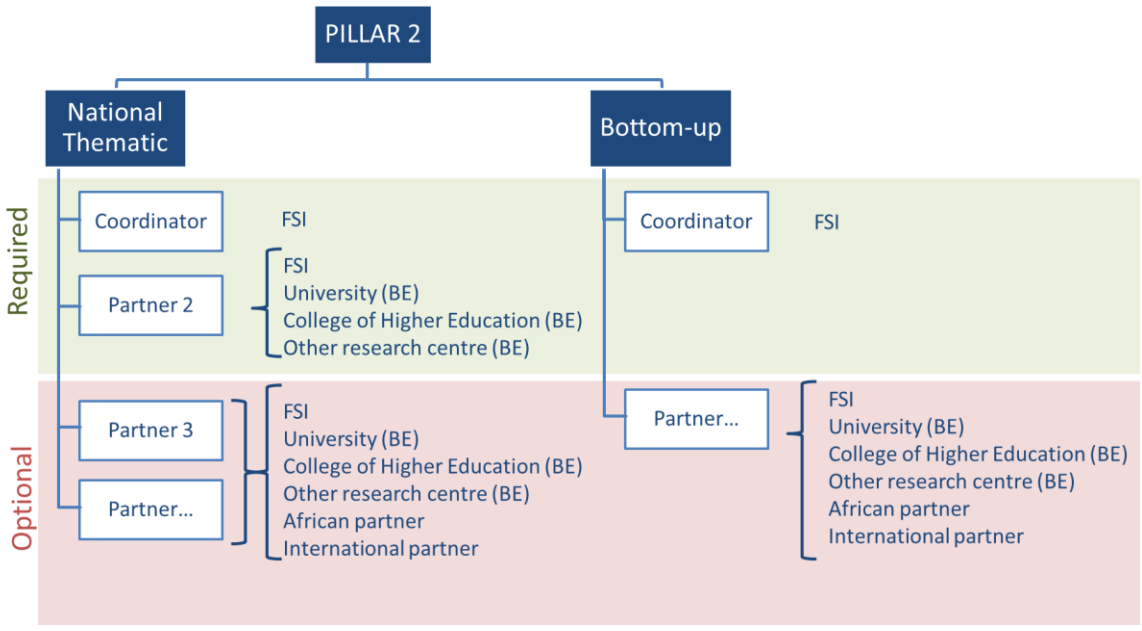
PILLAR 1B: BOTTOM-UP PART
THE CONTRIBUTION OF THE FSIs TO THE KNOWLEDGE OF THE EARTH AND UNIVERSE SYSTEM

Pillar 1B contributes to the strengthening of knowledge about the living (e.g. evolution) and non-living world (e.g. components of the Earth and Universe system). This part of pillar 1 is built around specific and innovative expertise that is specific to the FSIs and is in line with their strategic research challenges.

1.3.2. PILLAR 2: HERITAGE SCIENCE

The implementation of this pillar is done both via **thematic and bottom-up projects**.

All research projects - thematic and bottom-up - must be **coordinated by an FSI**, possibly in collaboration with universities and other research institutions. As such, the projects have as a challenge to fit into the global strategic priorities of the FSIs, in terms of their scientific expertise and / or their missions with regard to public service.



PILLAR 2 “HERITAGE SCIENCE”

Pillar 2 "Heritage science" is dedicated to scientific research in support of the federal - cultural, scientific and historical - heritage and in particular the heritage in Belgian federal scientific institutions (FSIs : see annex 1) as well as the heritage on which the FSIs deploy their expertise. The potentially involved heritage is of a diverse nature: material / tangible and intangible / digital, of national or international origin.

The aim of the pillar 2 is to mobilise and develop the scientific expertise on "Heritage science", namely scientific research to support conservation, access (including new ICT tools), interpretation and management of heritage, especially with a view to scientific exploitation and social valorisation. This approach, often interdisciplinary, is at the crossroads of a wide range of knowledge and expertise, from fundamental sciences to human and art sciences.

The research aims to support:

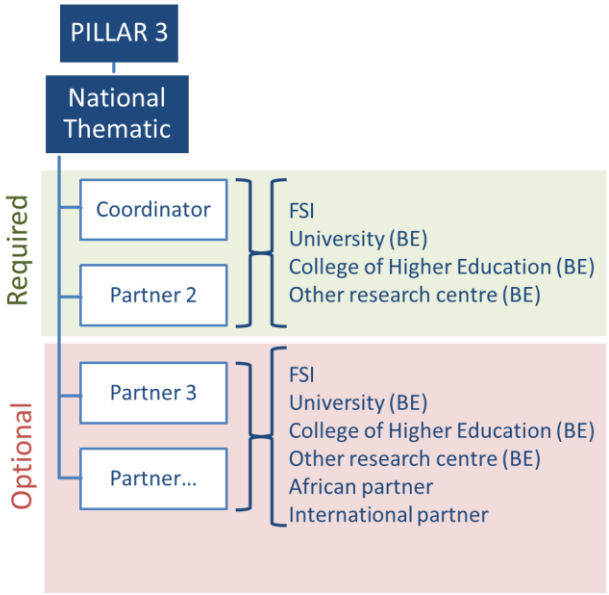
- The conservation, preservation and management of heritage and collections, with a view to exploitation, mainly scientifically, through the development and / or testing of best practices of techniques and methods, of sampling, of digitisation or other management and preservation methods, documentation, classification, identification and access to the information and / or access to material from the collections;

and /or

- Its placement in social, artistic, historical, geographical, environmental, health, scientific, technical, political, archaeological, linguistic, literary, musical, economic or cultural context, in a synchronic or diachronic perspective.

1.3.3. PILLAR 3: FEDERAL SOCIETAL CHALLENGES

The implementation of this pillar is done **only via thematic projects**.



PILLAR 3 “FEDERAL SOCIETAL CHALLENGES”

This pillar supports research that addresses current societal challenges (not covered by the other pillars). The topics funded in this pillar are selected in function of those challenges (e.g. health, security, ageing, economy...) that are considered a priority by the federal authority (as stated for example in Governmental Agreements, federal and interfederal plans...) and that align with international and European research agendas.

The ultimate goal is to develop a solid scientific expertise to support the competencies, strategic orientations and policies of the federal state. Such expertise will clearly enhance the knowledge base around these challenges, reveal opportunities and possible caveats and provide useful recommendations for the federal level.

The topics of this pillar will encourage research that mobilises a large spectrum of disciplines, that are embedded in the international and European context and that will strengthen the participation of a wide range of stakeholders.

1.4. PROJECT TYPES

The BRAIN-be 2.0 programme finances **3 types of research projects**:

- National thematic interdisciplinary projects
- International thematic interdisciplinary projects
- Bottom-up projects

1.4.1. NATIONAL THEMATIC INTERDISCIPLINARY PROJECTS

For the **3 Pillars**

SCOPE / PHILOSPHY

National thematic interdisciplinary projects are of a strategic nature. They must meet the specific research priorities of a call and must be interdisciplinary in their content.

PARTNERSHIP

National thematic interdisciplinary projects are submitted by a **network**, composed of at least two partners from different eligible Belgian scientific institutions and from different scientific disciplines.

Networks jointly share obligations and responsibilities during the implementation of the project. The project should be fairly balanced (see budget rules), even if different partners may have different tasks and subsequently different budgets.

The participation of **Federal Scientific Institutions** and the cooperation between research partners of **different Communities or Regions** is encouraged. At equal scientific quality between the proposals submitted, priority will be given to networks in which one or more FSIs are involved. In addition,

preference will be given to proposals composed of partners from different communities and/or that cover the Belgian territory.

A **coordinator** (belonging to a Belgian research institute) must be appointed in each proposal. The coordinator shall:

- Coordinate all activities to be carried out in the framework of the project;
- Coordinate the internal meetings between the network members;
- Coordinate the meetings with the Follow-up Committee and write the reports of these meetings;
- Coordinate the production of the interim and final project reports intended for BELSPO;
- Inform BELSPO of any problems that might hinder the implementation of the project;
- Coordinate the synthesis and translation of the research results, with a view to applications and support for decision-making;
- Coordinate the publication and dissemination of the research results;
- Organise meetings related to the project's progress between the network and BELSPO.

The project may require specific or punctual expertise, which can be delivered in the form of **subcontracting**.

The programme allows for cooperation with international research partners:

- **African research partners of Least Developed Countries**[2] can benefit from financing of maximum 20% of the total project budget. Note: in the project phase (one of) the Belgian project partner(s) will be responsible for the follow-up of the tasks carried out by the African partner(s) and will also be responsible for the flow of information to and from the African partner(s). The budget allocated for the African partner will contractually be added to the budget of this Belgian partner.
- Other international research partners can officially participate to the proposal, albeit with their own funding.

It is the responsibility of the Belgian partner(s) to check the eligibility of the African research partner(s) and/or the International research partner(s).

The programme promotes **equality between men and women in research**. The projects should therefore seek for a balanced network composition.

DURATION

National thematic interdisciplinary projects will have a duration of 2 or 4 years.

BUDGET

There is no maximum project budget set for this type of projects. However networks should take into consideration the total available budget within the Pillars (see 1.5) for each call and the fact that one of the objectives of the programme is to build up a critical mass on the research themes in the different calls. The objective is to develop a project with the most efficient use of public resources.

[2] https://unctad.org/en/Pages/ALDC/Least%20Developed%20Countries/UN-list-of-Least-Developed-Countries.aspx

1.4.2. INTERNATIONAL THEMATIC INTERDISCIPLINARY PROJECTS

The programme enables participation in transnational programmes and international thematic interdisciplinary projects, via participation in calls organised by relevant European, international or transnational research consortia such as ERA-NETs and Joint Programming Initiatives (JPI).

The introduction of this type of projects is subject to separate calls following the international call calendars and procedures.

1.4.3. BOTTOM-UP PROJECTS

Only for **Pillars 1 and 2**. Only **FSIs** can submit a bottom-up project.

SCOPE / PHILOSPHY

Bottom-up projects must meet the scope of the respective Pillar and must comply with the following:

- Strengthen the scientific potential or expertise of FSIs;
- Target and/or enable research on a specific circumscribed topic;
- Fit the strategic priorities of the FSIs in support of their specific areas of expertise or public service missions.

Bottom-up projects differ from thematic projects in the sense that they do not have to fit within the research priorities of a given thematic call, do not require multidisciplinary research, and therefore must not necessarily be carried out in a network.

PARTNERSHIP

Given their scope and philosophy, Bottom-up projects can only be submitted by an **FSI** and are restricted in terms of number of partners. They can be carried out by a single FSI (acting as coordinator) who, whenever required, may seek to have other research partners - including other FSIs and/or other Belgian research institutions, African research Partners from Least Developed Countries, and/or other (non-BELSPO funded) international research partners - in order to answer the scientific questions posed.

Funded partners will jointly share the obligations and responsibilities during the implementation of the project.

The project may require specific or punctual expertise, which can be delivered in the form of **subcontracting**.

DURATION

Bottom-up projects will have a duration of 2 or 4 years.

Bottom-up projects are small sized. The **maximum project budget** amounts up to **500 000 €.**

Each FSI may submit different bottom-up projects, for a total maximum amount **as coordinator** up to:

- Pillar 1: 1 500.000 €
- Pillar 2: 700 000 €

African research partners from Least Developed Countries[3] can benefit from financing that amounts to a maximum of 20% of the total project budget. Other international research partners can officially participate to the proposal, albeit without BELSPO funding.

1.5. CALENDAR AND BUDGETS OF THE CALLS FOR PROPOSALS

The calendar and the indicative budgets for the calls for proposals are as follows (budgets in K€):

Available budget in K€	call 2018-2019	call 2020-2021	call 2022-2023	TOTAL
Pillar 1: Challenges and knowledge of the living and non-living world	11 407	11 407	11 407	**34 221**
Pillar 2: Heritage science	8 703	8 703	8 703	**26 109**
Pillar 3: Federal societal challenges	9 290	9 290	9 290	**27 870**

2. CONTRACTUAL OBLIGATIONS FOR SELECTED PROJECTS

2.1. CONTRACTS

For the selected proposals, a contract is concluded between BELSPO and the funded team(s).

For this purpose, the submitters of the selected proposal will be asked at the end of the evaluation and selection procedure to concisely formulate the specifications on the basis of which the contract is to be drawn up. This **Technical Annex** to the contract will be drawn up in consultation with BELSPO and will take into account the recommendations formulated by the foreign evaluators and the Advisory Committees.

Adaptations to the original proposal may relate, among other things, to the content of the research, the composition of the project partnership or Follow-up Committee, the budget, the proposals for valorising the research.

BELSPO grants the selected projects the **funds** required for their implementation. BELSPO shall reimburse at most, and up to the amount specified in the granted budget, the actual costs proven by the partners providing these costs are directly related to the implementation of the project.

3 https://unctad.org/en/Pages/ALDC/Least%20Developed%20Countries/UN-list-of-Least-Developed-Countries.aspx

2.2. REPORTS AND PROGRESS MEETINGS

The contract foresees the following reports to be submitted to BELSPO:

- Initial report: to be submitted within three months after the start of the project;
- Activity reports: to be submitted annually;
- Final report: to be submitted at the end of the project;
- If deemed useful by BELSPO, an activity report may be requested for an external evaluation of the project;
- BELSPO can ask for a report or other input at any time during the course of the project in order to provide scientific support to valorisation and service actions related to the programme.

These reports are to be included in the project work plan and the cost of preparing them (including possible translations) must be covered by the project budget.

Meetings on the project's progress must be organised - minimum once a year - between the project partner(s), BELSPO and the user committee. The organisation of these meetings must be included in the project work plan and the project budget.

2.3. DATA, RESULTS, INTELLECTUAL OWNERSHIP AND OPEN ACCESS

Foreground - the results (including information) produced by the project - shall be the property of the institution carrying out the work generating this foreground, as mentioned in article 11 of the General Conditions (Annex II of the contract) (https://www.belspo.be/belspo/brain2-be/docum_en.stm). As regards existing information and data, ownership remains the same.

Each institution shall ensure that the foreground of which it has ownership, is disseminated as fast as possible and free of charge.

In accordance with the relevant BELSPO Open Research Data Mandate, each Institution undertakes to make the foreground and background relating to research data, available as soon as possible and free of charge in an approved data repository (Open Research Data Repository). This concerns data that supports the research results, with its metadata and other contextualised (curated) and/or raw data mentioned in the Data Management Plan (DMP) submitted by the grant applicant. The data must comply with the FAIR principle (Findable, Accessible, Interoperable and Reusable) and must be accessible according to the principle "As open as possible, as closed as necessary".

For research areas concerning the marine environment, the Antarctic and biodiversity, researchers must transfer a copy of the analysis and measurement data and/or metadata to specific databases such as:

- BMDC (the Belgian Marine Data Centre) (http://www.bmdc.be). The Belgian Marine Data Centre, our federal NODC (National Oceanographic Data Centre), (bmdc@naturalsciences.be), can be contacted for assistance in the development of a DMP for marine applications and/or in choosing the right repository.

- AMD (Antarctic Master Directory) (https://www.scqr.org/data-products/antarctic-master-directory/). The Belgian representative of SCADM (the SCAR Standing Committee for Antarctic Data Management) (avandeputte@naturalsciences.be) can be contacted for assistance in the development of DMP for Antarctica related applications and/or in choosing the right repository.

- GBIF (Global Biodiversity Information Facility) (https://www.gbif.org/. The Belgian Biodiversity Platform (http://www.biodiversity.be) can be contacted for assistance in the development of DMP for biodiversity related applications and/or in choosing the right repository. See also the guidance document: https://zenodo.org/record/3448251#.XkagsnDsaUl

For social and Humanities data, a copy of the data and/or metadata must be transferred to SODA (Social Sciences Data Archive) (https://sodabelgianproject.wixsite.com/sodaproject).
The promoters of projects that include tasks in which biological materials are used, must ensure the preservation of this biological material by depositing it in a culture collection (Biological Resource Centre), and preferably one in Belgium. This does not apply to material that promoters can prove has already been deposited in a culture collection or for which existing agreements (Material Transfer Agreement) do not allow it to be deposited. Biological material includes cultivable organisms such as microorganisms, viruses, plant, animal and human cells as well as the replicable parts of these organisms, such as non-modified and recombinant plasmids (including those with DNAc inserts).

2.4. RESEARCH ETHICS

The first code of ethics for scientific research in Belgium was drawn up in 2009 (see http://www.belspo.be/belspo/organisation/publ/pub_ostc/Eth_code/ethcode_en.pdf).

The "Code of Ethics for Scientific Research in Belgium" is a joint initiative of the Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, the Académie Royale de Médecine de Belgique, the Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten and the Koninklijke Academie voor Geneeskunde van België, with the support of BELSPO.

All projects must take this code of ethics into account in their research. If necessary the Ethical Board of the institutions concerned by a project must be consulted before submitting a proposal.

2.5. GENDER

BELSPO strongly encourages projects to take into account the equality between women and men and to ensure gender mainstreaming in the implementation of the project. The project should include this both in the choice of the researchers and, where relevant, by integrating the gender dimension into their research. All statistics produced, collected and commissioned are, where appropriate, disaggregated by sex and gender indicators are established where relevant.

PART II: CALL INFORMATION

3. DOCUMENTATION RELATED TO THIS CALL

The following documents are available on the BRAIN-be website (https://www.belspo.be/belspo/brain2-be/call_open_en.stm):

- Information file: general information on the programme and the call (the present document)
- Evaluators eligibility: eligibility rules of proposed experts for the evaluation of the proposal
- Submission and evaluation guidelines: overview proposal content and corresponding evaluation criteria for the promoters and foreign evaluators
- Evaluation matrix: overview of the evaluation ratings
- Gender checklist
- Budget rules: overview of the budgetary rules to be applied
- Platform Submission guidelines: information on the use of the submission platform
- Institution Request Form
- Platform Evaluation guidelines: information on the use of the evaluation platform
- Strategic Committee members: Pillars 1, 2 and 3
- FAQ

4. SCOPE AND RESEARCH PRIORITIES OF THIS CALL

The current call only concerns Pillar 2 'Heritage science'.
The call for proposals related to Pillars 1 and 3 will be launched later in spring 2020.

4.1. RESEARCH FRAMEWORK

The implementation of this pillar is done both via **thematic and bottom-up projects**. All research projects - thematic and bottom-up - will be **coordinated by an FSI**, possibly in collaboration with universities and other research institutions. As such, the projects have as a challenge to fit into the global strategic priorities of the FSIs, in terms of their scientific expertise and / or their missions with regard to public service.

PILLAR 2 "HERITAGE SCIENCE"

Pillar 2 "Heritage science" is dedicated to scientific research in support of the federal - cultural, scientific and historical - heritage and in particular the heritage in Belgian federal scientific institutions (FSIs : see annex 1) as well as the heritage on which the FSIs deploy their expertise. The potentially involved heritage is of a diverse nature: material / tangible and intangible / digital, of national or international origin.

The aim of the pillar 2 is to mobilise and develop the scientific expertise on "Heritage science", namely scientific research to support conservation, access (including new ICT tools), interpretation and management of heritage, especially with a view to scientific exploitation and social valorisation. This approach, often interdisciplinary, is at the crossroads of a wide range of knowledge and expertise, from fundamental sciences to human and art sciences.

The research aims to support:

- The conservation, preservation and management of heritage and collections, with a view to exploitation, mainly scientifically, through the development and / or testing of best practices of techniques and methods, of sampling, of digitisation or other management and preservation methods, documentation, classification, identification and access to the information and / or access to material from the collections;

and /or

- Its placement in social, artistic, historical, geographical, environmental, health, scientific, technical, political, archaeological, linguistic, literary, musical, economic or cultural context, in a synchronic or diachronic perspective.

4.2. SCIENTIFIC APPROACH

The research projects need to make a scientific contribution in the form of a cross- and interdisciplinary exploitation/valorisation of relevant federal heritage, if possible clustered to gain critical mass.

The objective is to federate the expertise of the scientific community – in the scientific institutions, universities and other research centres - around topics which present an issue of scientific knowledge that is important for the promotion of federal heritage.

In order to clearly demonstrate the concordance between the research projects and this joint approach, the proposals will provide the following in an explicit and well-argued manner:

- Identification of the federal heritage (sub)-collections – cultural, historical and/or scientific – tangible and/or intangible – of national and/or international origin – for which the project will provide a scientific contribution.
  Using collections in the project that aren't part of the federal heritage can be envisaged as far as:
  - Federal institutions contribute to their promotion, through their expertise,
  - They are used in the project as additional support for the federal (sub)-collections.

- The nature of the interdisciplinarity implemented in the project, especially at the level of:
  - The mobilised scientific disciplines,
  - And / or the integration of methodological approaches
  - And / or the various ways to apprehend the studied topics
  - And/or the merging and/or possible integration of (sub)-collections of a heterogeneous nature
  - ...

- Demonstration of the balance between the project's methodology on the one hand – including the tasks to valorise and disseminate the results – and, on the other hand, the objectives that the project is pursuing in terms of relative impact and benefits (scientific, strategic, policy supporting,

societal) and in terms of sustainability (e.g. through possible further integration into distributed European infrastructures such as ESFRI).

This joint approach will be encouraged by the organisation of research in partnerships. This will allow a reinforcement of the collaboration between the different scientific actors, particularly with and between the institutions responsible for the heritage concerned, as these institutions are on the front lines of the exploitation and valorisation of their heritage.

The research projects will take advantage of international research activities in the fields concerned, as necessary. Some scientific communities, certainly in the field of social science and humanities, have developed in recent years impressive open digital research and collaboration tools. Project proposals are strongly encouraged to develop, re-use and open up these digital tools, methods, data repositories and collection data to scale up research outputs.

4.3. CALL PRIORITIES

4.3.1. NATIONAL THEMATIC CALL RESEARCH PRIORITIES

[1.] HERITAGE SCIENCE: DEVELOPING METHODOLOGIES TO ENSURE THE PHYSICAL AND DIGITAL INTEGRITY OF COLLECTIONS

Motivation and general challenge

Both preventive and curative conservation are core to the collection management within all FSIs and one of the main missions for several of them. Preventive conservation touches various aspects in collection management, including handling and maintenance procedures. Due to evolution in conservation sciences, technologies, law and analytical techniques themselves as well as to environmental changes, we need to assess (regularly) our (best) practices in preventive conservation as well as prior conservations/conservation materials.

A general concern is to understand how and under which conditions materials alter to define suitable preventive conservation materials and methods to guarantee the conservation of the physical integrity and quality of the federal collections. This requires material identification, condition assessment, and ageing factors influencing the physical integrity of original materials and possible later (curative or preventive) interventions.

Possible federative / pluri-disciplinary aspects

- Conservation is core to the collection management within all FSIs and for several FSIs it is one of their main missions;
- Conservation touches (technical) art history, sciences, engineering, management …

Research Scope

Establishing suitable preventive conservation materials and methods to guarantee the conservation of the physical integrity and quality of the federal collections requires material identification, condition assessment, and identification of modification factors (conditions and conservation methods) influencing the physical integrity of original materials and possible later (curative or preventive) interventions. This call focuses on:

- New, modern original objects and/or interventions from the late 19th and 20th c.: The late 19th - mid 20th century was a time of change in the history of art in which new art movements followed one another rapidly. It was also a time of swiftly developing materials and techniques, which were used in new art works as well as for conservation-restoration interventions on cultural and natural heritage collections. Both do not only influence the evolution of art history but also could affect the way works of art or specimens degrade and thus how we should conserve cultural and natural heritage collections for the future.

- Digital-born materials: The Digital Age introduced new media for the expression of art, a way of production of collections, and a way of archiving of collections (video, digital data …), where the physical existence of the collection has become the media on which the digital data is stored. Such (art) objects use technologies which evolve at a fast pace, touching the question of ephemeral art or data. This brings new challenges not only in the conservation of the supporting media, and hence the digital data and/or objects as such, but also in their definition.

- Biological collections: The genetic stability of micro-organisms or the preservation of the genetic information of the natural history specimens addresses similar issues to guarantee their biological integrity by assessing the modifying factors.

Material identification and condition assessment of specimens and collections requires the evaluation of (preferably non-destructive) technologies, including scanning techniques such as computed tomography, XRF, XRD, Raman and/or FTIR scanning, microfading or multispectral imaging for the study and documentation of cultural and natural heritage collections. Reference data collections with identification of their material characteristics are essential for this, and these need to be developed as a matter of urgency.

Expected Impact

- Reference data over past history of collection items and impact of conservation practices;
- Assessment and development of best practices for preventive conservation and collection management (including exhibition, destructive analyses and loan policy)

[2.] SUSTAINABLE MANAGEMENT OF COLLECTION IN RESPONSE TO CLIMATE CHANGE

Motivation and general challenge

Sustainable management of collections and archives implies implementing actions for reducing the vulnerability of our cultural institutions. First, the institutions face increased hazard risks associated with extreme weather events, floods, fires, etc. that are becoming more intense due to climate change. Second, while the European directives push the public and private sectors to invest in nearly-zero energy buildings (NZEB), our cultural institutions are still very dependent on traditional energy sources, generating greenhouse gases, and of which the availability in the future is not guaranteed. This topic takes into account, amongst others, the increased economic and ecological awareness in this context for the selection of materials and procedures for buildings, conservation-restoration and preventive conservation of collections.

Possible federative / pluri-disciplinary aspects

The sustainable management of collection facilities is essential for almost all FSIs, as well as for every other actor in the heritage sector. Any collection is likely to face increased hazard risks due to climate change, and any institution is likely to be forced reducing its carbon footprint and shifting their consumption pattern. Depending on the focus of the research, this may include physical (non-destructive) research to identify the vulnerability of collections to certain hazards, strategies to optimize the

museum's operation (e.g. improving the energy performance of the building and its equipment) as well as biomedical research to establish the health risks of hazardous collections, while risk management plans should be based on an assessment of the values of individual collections. As several FSIs are likely to face similar risk assessments, these challenges will encourage collaborative research projects in support of recommendations to the federal government.

Research Scope

Research projects addressing the sustainable management of collection facilities in the context of increased risks due to climate change, and increased efforts to reduce the carbon footprint may include research on:

- The pre-screening of collections using non-destructive technologies to assess their vulnerability to the increased hazard risks;
- The assessment of sustainable packaging materials and transport in handling collections, and the development of methods for preserving our collections while reducing the carbon footprint of the cultural institution, taking into account the increased economic and ecological awareness in this context;
- The assessment of collection (emergency) management plans to deal with the increased hazard risks;
- The use of digital monitoring tools to assess the impact of climate change on the collections and the energy consumption of the facilities.

Expected Impact

The research topic is of concern to most Federal Scientific Institutes as well as to the general and international heritage sector. It has the potential to strengthen first of all, the collaboration between the FSIs addressing in a joint approach, common issues related to the sustainable management of the federal collections in response to climate change implying more extreme weather events such as floods, fires for which the existing procedures will not suffice.

[3.] LINKING, ENRICHING AND INTEGRATING (DIGITAL) COLLECTIONS FROM VARIOUS SOURCES

Motivation and general challenge

The FSIs have developed and collected long data series of historical observations or large sets of digital collections, which may have various origins, characteristics and/or quality. These collections include heritage data, data from open/citizen science initiatives or crowd-sourcing.

Because data may be not compliant (anymore) with current scientific standards, it requires extra care for research and/or operations by the FSI to make them suitable, while it can still complement or even supplement high quality data collections.

This thematic priority addresses the challenges raised by linking or enriching such datasets.

Research Scope

Linking or integrating existing digital collections of various sources and/or quality, requires specific data management strategies for their study, interpretation and valorisation, including pre-processing, quality assessment and standardization. Target datasets must be secured, appropriately characterized and documented (including information about their potential deficiencies) and should be investigated if they can be FAIR compliant. Such specific management may require innovative methods or the set-up of adequate data infrastructures or systems of linked open data.

The final research scope is to define and apply appropriate data management strategies and scientific development for the integration of such data sets, taking into account their intended valorisation.

Expected Impact

The target data sets and (digital) collections shall preferably, either offer opportunities for machine learning applications, or be suitable for archiving in (international) data stores or for feeding data rescue programmes. Their reprocessing, study, interpretation and/or valorization shall strengthen the activities led by the Federal Scientific Institutions. They shall increase their visibility and/or their contribution to regional, federal or international programmes, improving the sustainability of Belgian research and/or their international recognition.

[4.] UNTOLD (HI)STORIES

Motivation and general challenge

In a diverse society, there is a growing demand for an inclusive history that represents its various communities, urban societies and their untold histories. Second, there is also a demand for participative history. Indeed, it is felt that official narratives in the public space, such as in schools or heritage institutions, often provide a narrow and one-sided portrayal of complex events in the past. These include for example colonial history, natural resource exploitation, medical history, conflict and war, trade, industrialization and the human impact on the environment. The federal material and immaterial heritage provides opportunities for other voices to be heard, from the bottom up. This implies analysing a variety of traditional and new sources, such as documents, photographs and objects, but also oral history, music, digital information carriers, landscape as well as other immaterial sources that document a polyphonic story, that may even be unfinished, or perhaps overwritten in a constantly changing world.

Possible federative / pluri-disciplinary aspects

History is told using documentary sources as well as oral history, archaeology, history of art, life stories, historical linguistics and anthropology. The Federal Scientific Institutes are keepers of such collections and archives (of images, objects, sound records …) at the same time practicing research in various interdisciplinary combinations of disciplines with a historical dimension. These assets allow contributing to the reconstruction and visualization of perspectives untold in current narratives. Through their public displays they have an immediate impact on the public space. By their education programs and outreach they can present diverse perspectives for a critical discussion.

Research Scope

The projects will aim at exploring and valorising untold aspects of history of currently underrepresented communities based on the various existing types of federal heritage in a multidisciplinary approach, at the same time presenting new and best practices of sharing these histories.

Expected Impact

Respond in an integrated scientific, multidisciplinary and participatory way to the demand of various stakeholders:

- Create inclusive storytelling and mediation programs;
- Contextualise underrepresented federal scientific collections and aspects in a historical perspective in the displays of their various museums;

- To include the histories of communities with migration background in the official teaching programs and develop tools and practices;
- Raise awareness for gender histories transported implicitly through display and comments.

[5.] EARLY MODERN HERITAGE (14TH – 18TH C.) OF THE SOUTHERN LOW COUNTRIES

Motivation and general challenge

The federal scientific institutions (FSI) conserve a rich cultural heritage dating from the early modern times. Furthermore, they employ a great number of experts and harbour recognised expert knowledge. During the period ranging from the 14th to the 18th century, works of art recognised across the world today were produced in the area now known as Belgium. From a political point of view, this area in the midst of Europe was an extraordinarily unique entity with regard to legal and political rules.

Possible federative / pluri-disciplinary aspects

Research projects are based on the study of bodies of significant and/or remarkable cultural heritage of any kind (art, archives, manuscripts, prints).

The involved technicalities necessary for the study of this cultural heritage lend themselves particularly well for collaborations. For example, medieval diplomacy may require the input from biologists for parchment analysis, and specialists in Digital History may be required to exploit digital sources.

Research Scope

Research will focus on the following:

- Digital exploitation of sources;
- Culture, usages and practices in writing, history of law and institutions, originality of the political system, balance of power between the governors and the governed / elites and populations, the process through which the modern state emerged, collective identities;
- Interactions between artistic and intellectual currents, including late appropriations of foreign currents, political, social and economic context of artistic and intellectual creation, mutual influences that enabled the masters of these times to foster innovative external trends or to ensure the spreading of artistic and intellectual work from the Southern Netherlands and the principality of Liege.

Expected Impact

- Enabling the development of network-based research projects that exploit significant parts of the cultural heritage conserved by the FSI;
- Increase the FSI's visibility and/or their contribution to regional, federal or international programmes, improving the sustainability of Belgian research and/or their international recognition.

4.3.2. TRANSNATIONAL THEMATIC CALL RESEARCH PRIORITIES

For this 2020-2021 Pillar 2 call, there is no participation foreseen in transnational programmes, such as the ERA-NETs and/or the Joint Programming Initiatives (JPI).

4.3.3. BOTTOM-UP PROJECTS

The aim of these projects is to support the Federal Scientific Institutes (FSIs) in their scientific potential in their specific areas of expertise or missions.

Only FSIs can submit a bottom-up project. Given their scope and philosophy, bottom-up projects are restricted in terms of number of partners. They can be carried out by a single FSI (acting as coordinator) who, whenever required, may seek to have (an)other partner(s) - including other FSIs and/or other Belgian research institutions, African research Partners from Least Developed Countries, and/or other (non-BELSPO funded) international research partners - in order to answer the scientific questions posed.

The projects do not have to be in line with the thematic research themes in the context of the calls, but must be linked to the general frame of Pillar 2.

4.4. PROJECT BUDGET

The maximum available budget for the current call 2020-2021:

Type of project	**in k€**
National thematic projects	5 657
Transnational thematic projects	NA
Bottom-up projects	3 046

4.5. PROJECT STARTING AND END DATE

The projects selected within the context of the current call will start 15 December 2020 or 15 January 2021, depending on the programme budget repartition over 2020 and 2021. The project contracts will have a duration of 2 or 4 years plus 3 months to allow meeting all administrative requirements before the effective start-up of the project.

5. CONTACTS

Further information can be obtained by contacting the **secretariat**: **BRAIN-be@belspo.be**

6. COMPLAINTS

BELSPO places great importance on the quality of its service and on improving the way it operates. A special form to handle complaints has been created.

The complaint form is available at the following address:
http://www.belspo.be/belspo/organisation/complaints_en.stm

Complaints submitted anonymously or which are offensive or not related to our organisation will not be processed.

A complaint is handled as follows:

- Once your complaint has been filed, a notification of receipt will be sent;
- The complaint will be forwarded to the relevant departments and individuals and will be processed within one month;
- An answer will be sent by e-mail or letter;
- The complaint will be treated with strict confidentiality.

If you are dissatisfied by the initial response to a complaint, you can always contact the Médiateur Fédéral / Federal Ombudsman, rue Ducale / Hertogstraat 43, 1000 Brussels (email: contact@mediateurfederal.be / contact@federaalombudsman.be).

ANNEX 1: LIST OF FEDERAL SCIENTIFIC INSTITUTIONS (FSIs)

- National Archives and State Archives in the Provinces (ARA-AGR)
- National Institute of Criminalistics and Criminology (NICC-INCC)
- Royal Belgian Institute for Space Aeronomy (BIRA-IASB)
- Royal Belgian Institute of Natural Sciences (KBIN-IRSNB)
- Royal Institute for Cultural Heritage (KIK-IRPA)
- Royal Library of Belgium (KBR)
- Royal Meteorological Institute of Belgium (KMI-IRM)
- Royal Museum for Central Africa (KMMA-MRAC)
- Royal Museums of Art and History (KMKG-MRAH)
- Royal Museums of Fine Arts of Belgium (KMSKB-MRBAB)
- Royal Observatory of Belgium (KSB-ORB)
- Sciensano
- War Heritage Institute (WHI)

ANNEX 2: LIST OF FEDERAL DEPARTMENTS

- FPS Economy, SMEs, Self-Employed and Energy
- FPS Employment, Labour and Social Dialogue
- FPS Finances
- FPS Foreign Affairs, Foreign Trade and Development Cooperation
- FPS Public Health, Food chain safety and Environment
- FPS Internal Affairs
- FPS Justice
- FPS Mobility and Transport
- FPS Policy and Support
- FPS Social Security
- Ministry of Defence
- PPS Social Integration, anti-Poverty Policy, Social Economy and Federal Urban Policy