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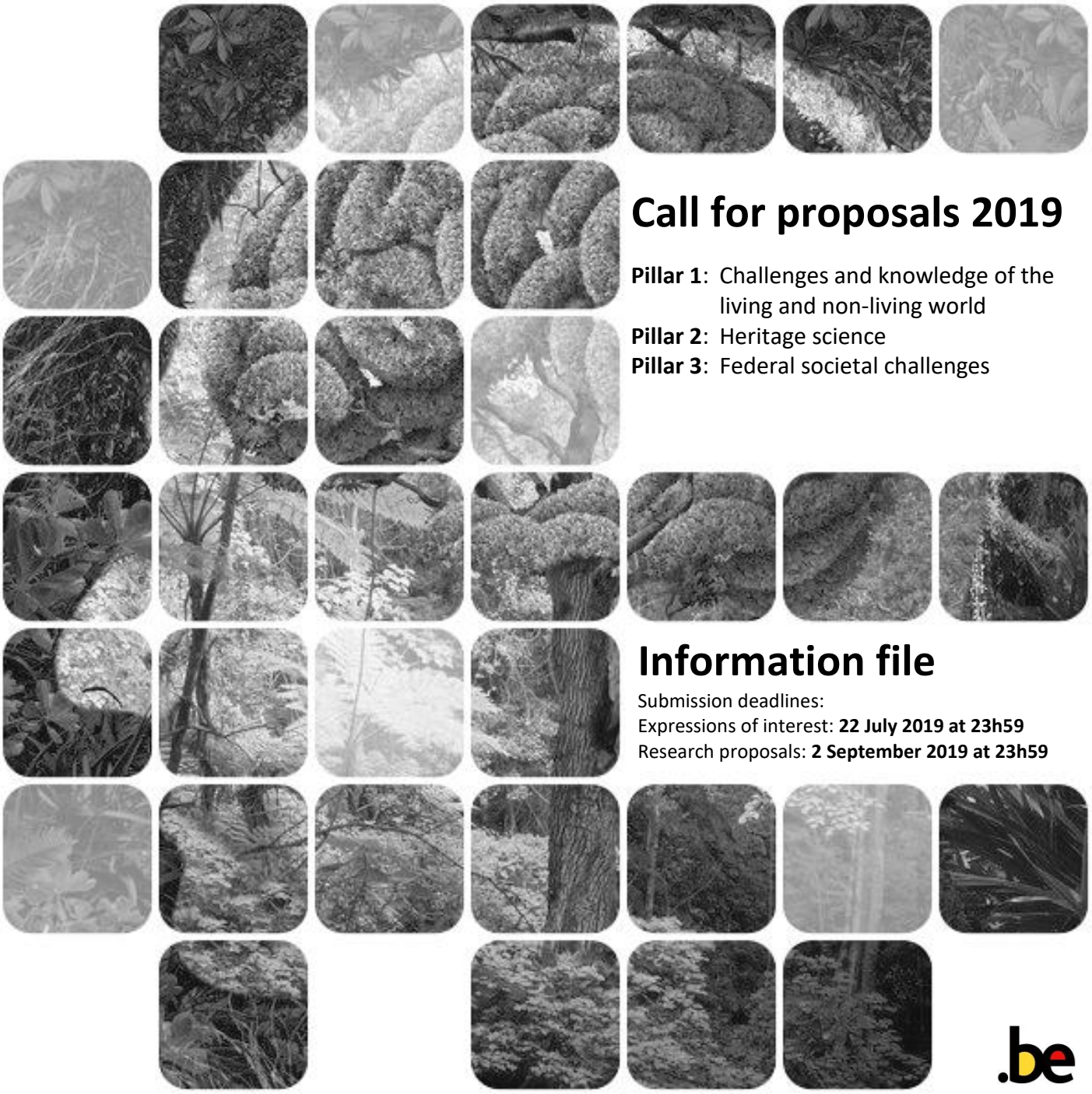
BRAIN-be 2.0

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



Call for proposals 2019

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

Information file

Submission deadlines:
Expressions of interest: **22 July 2019 at 23h59**
Research proposals: **2 September 2019 at 23h59**

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

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] (FSI - see annex 2) and meeting the federal departments' scientific knowledge needs.

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

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

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

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

1.2. PROJECT TYPES

The framework programme is based on the financing of 4 types of research projects:

- **National thematic** interdisciplinary projects of 2 or 4 years: of a strategic nature, these projects aim to meet the research priorities included in the thematic biennial calls of the three respective pillars. These 2 or 4 year projects are introduced by a research network composed of FSI, other national partners and/or African partners of Least advanced African countries[2].
- **Transnational thematic** interdisciplinary projects: participation to relevant European, international or transnational research activities,
- **Non-thematic bottom-up** projects: these projects do not have to adhere to the research priorities included in the thematic biennial calls, but must meet the scope of Pillars 1 and 2 (this project type is not foreseen for Pillar 3). Created to support the scientific potential of Federal Scientific Institutions (FSIs) in their specific areas of expertise and/or missions, bottom-up projects can only be submitted by FSIs. These 2 or 4 year projects may or may not be implemented in collaboration with other FSI and/or national partners and/or African partners of Least advanced African countries[3].
- **Non-thematic PhD** projects: these 4 year projects are only foreseen in Pillars 1 and 2, to be submitted by Federal Scientific Institutes (FSIs) in collaboration with a Belgian university, to support their scientific potential in their specific areas of expertise or missions. The projects do not have to be in line with the research themes in the context of the biennial calls, but must be linked to the general context of the concerned Pillar.

[1] The acronym FSI covers the institutions as defined in the Royal Decree of 30 October 1996 and NCIC, Sciensano and WHI.
[2] https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf
[3] https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf

1.3. CALENDAR AND BUDGETS OF THE CALLS FOR PROPOSALS

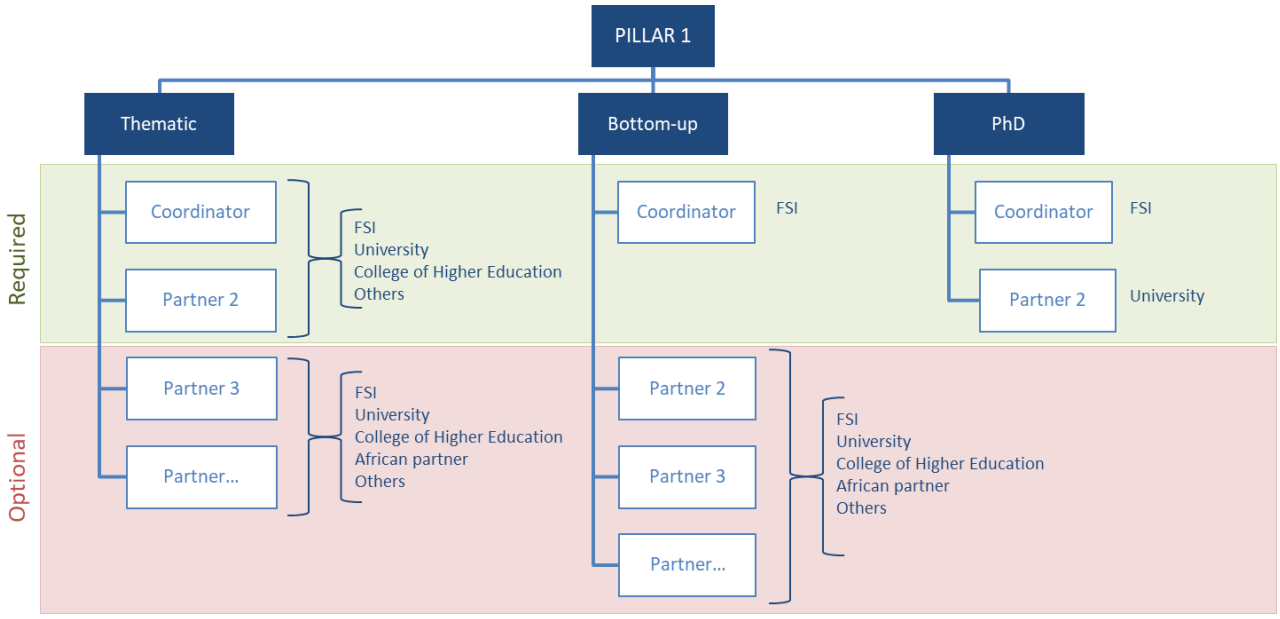
The calendar and the indicative budgets for the calls for proposals as mentioned in the note to the Council of Ministers are as follows (budgets in K€):

Available budget in K€	call 2018	call 2019	call 2020	call 2021	call 2022	call 2023	TOT
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**

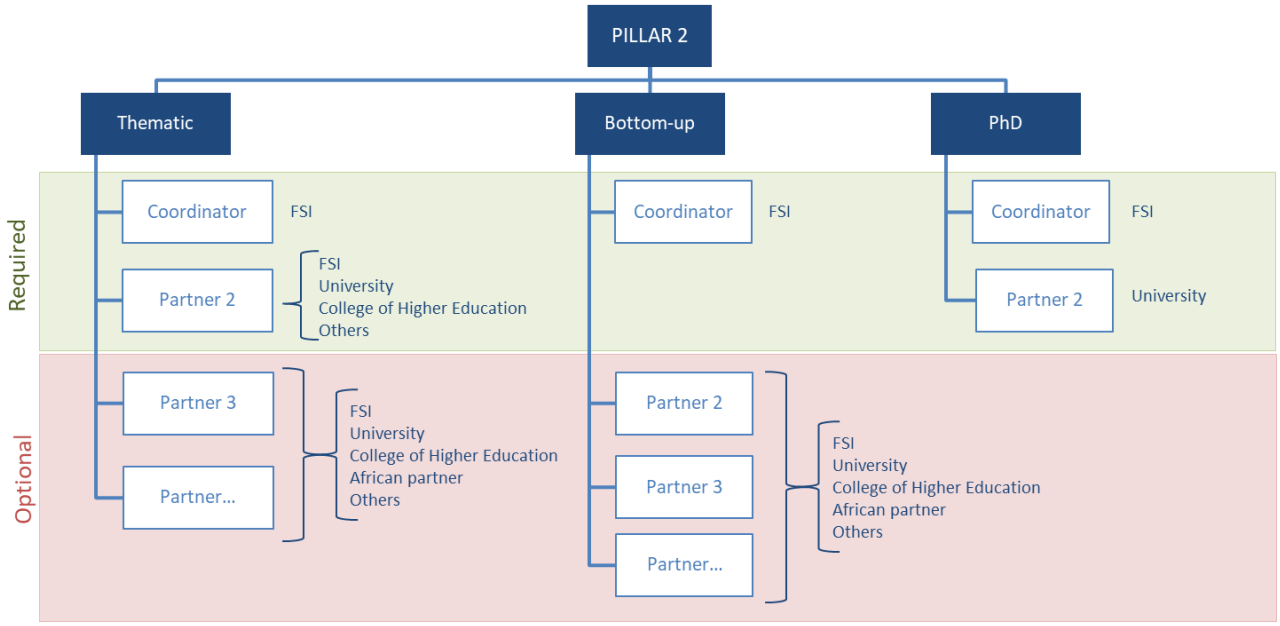
2. SCOPE OF THE CALL

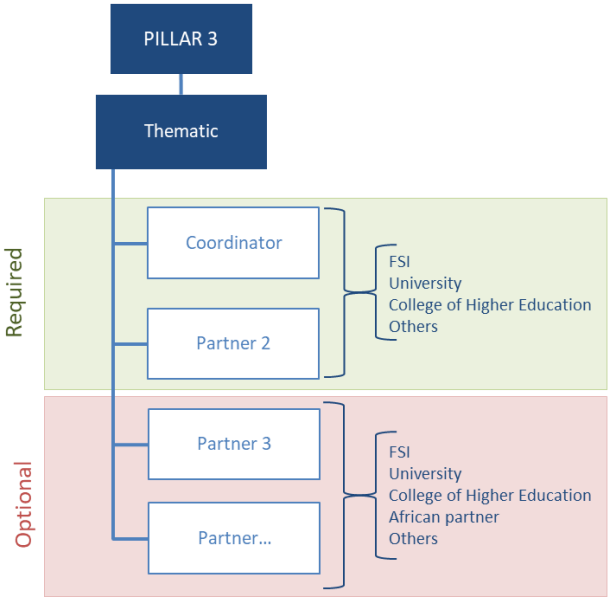
The current call concerns the Pillars 1, 2 and 3.

PILLAR 1 OVERVIEW SCHEME



PILLAR 2 OVERVIEW SCHEME





The available budget for each Pillar and project type for the current call 2019 (in K€):

Type of project	Pillar 1[4]	Pillar 2	Pillar 3
National thematic projects	7.322	5.657	9.290
Transnational thematic projects	1.235	-	NA
Non-thematic projects (bottom-up and PhD)	2.850	3.046	NA

The research priorities for these Pillars are described in this chapter.

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

2.1.1. GENERAL FRAME

The implementation of this pillar is done both via **thematic and non-thematic calls**.

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 agreements, the Antarctic Treaty, OSPAR).

They cover, inter alia, the research in support of mitigation and adaptation to climate change, the

[4] The final budget repartition between national and transnational thematic projects is subject to the result of the biodivERsA call selection process. The maximum amount of budget allocated to this transnational call is 500 k€. In case (part of) this budget is not spent, it will be allocated to the national thematic projects.

protection of biodiversity and ecosystem services, the protection of the natural environment, natural risks, and the sustainable exploitation of resources.

The present call addresses one priority research theme, namely "Scientific support to the sustainable exploitation of natural resources".

PILLAR 1B: NON-THEMATIC PART
THE CONTRIBUTION OF THE FSI 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 FSI's and is in line with their strategic research challenges.

2.1.2. GENERAL APPROACH

Research will focus on priority themes in support of the development and monitoring of policies lead by the Belgian federal State and related to activities dealing directly or indirectly with the exploitation, trade and use of natural resources. The concerned sectors of activities include health, food, environment, development cooperation, risk management, consumer protection, energy, and product standards.

The call will address policies and activity types of priority interest to more than one Federal Department. It will focus on research approaches and resources types for which an expertise exists in Belgium and more specifically within the Federal Scientific Institutions.

Research will be performed on the Belgian territory and, where relevant, in countries for which Belspo has developed a scientific institutional cooperation a.i. the BRICS countries (Brazil, Russia, India, China, South Africa) + Vietnam. Also included are the Least Development Countries and more specifically the 12 Least Developing African Partner Countries of the Belgian governmental cooperation a.i. Benin - Burkina Faso - Burundi - DR Congo - Guinea - Mali - Mozambique - Niger- Rwanda - Senegal - Tanzania - Uganda. The Southern Ocean and part of the North Sea adjacent to Belgian Continental shelf including the channel are also areas concerned by the present call.

The present call aims to contribute to the UN Sustainable Development Goals, in particular SDG 12 "Responsible Production and Consumption", but also SDG 6 "Access to safe water", SDG 7 "Use of renewable energies" , SDG 2 "Zero hunger" SDG 14 "Life below water", SDG 15 “Life on land”.

The call contributes to Belgium's participation in the EU-Africa Agreement, notably through the strengthening of skills in the field of agriculture and food. The call is supporting amongst other initiatives of the EU Raw Material Initiative and of the 7th EU Environment Action Program to 2020.
The research to be carried out will complement efforts made at European and international level, notably in the H2020 Societal Challenge 5 : Climate Action, Environment, Resource Efficiency and Raw Materials program and H2020 Societal Challenge 3 : Secure, Clean and Efficient Energy.

2.1.3. NATIONAL THEMATIC CALL RESEARCH PRIORITIES

INVENTORISE THE RESERVES OF (NON)RENEWABLE NATURAL RESOURCES IN BELGIUM AND ASSESS RESOURCES AVAILABILITY ACCORDING TO DIFFERENT PRODUCTION, CONSUMPTION AND, WHERE RELEVANT CLIMATE SCENARIOS

In particular, map/ inventorise

- The reserves of critical mineral resources amongst the 27 Critical Raw Materials defined by Europe.
- The geothermal energy production potential taking into account interferences between different uses of the sub-soil: cartographic developments, interoperability of geological data.
- Groundwater resources taking account of their interaction with surface water: development of tools and methodologies for monitoring, modelling, data management and visualization.

ASSESS ENVIRONMENTAL, HEALTH AND SOCIAL (RISK OF) IMPACT OF ACTIVITIES RELATED TO THE PRODUCTION AND CONSUMPTION OF NATURAL RESOURCES CARRIED OUT BY BELGIUM IN AND OUTSIDE THE TERRITORY

The call will focus on resources and on production areas with high risk of ecosystem degradation or destruction, of geological hazards and of health and sociological negative impacts and where the implementation of alternative methods of production and use are worth exploring.

More specifically, the call aims to:

- Develop (risk) assessment tools of potential hazards and environmental impacts associated with exploitation of geothermal energy and storage functions in Belgium;
- Evaluate the Belgium footprint (part of the global footprint) of imported renewable organic materials. Assess the socio-economic and environmental impacts such as land degradation, deforestation and biodiversity loss of an increasing demand of organic resources. Analyse will take into account, as appropriate, the capacity of regeneration of resources.
- Assess the cumulative effects of economic activities such as fishing, sand extraction, wind energy on the seabed habitat, water column and surface water of the Belgian part of the North Sea with the aim of sustainable management of the marine ecosystem.

DEVELOP SCIENTIFICALLY BASED TOOLS TO SUPPORT INTEGRATED POLICIES FOR THE PRODUCTION, EXPLOITATION AND SUSTAINABLE CONSUMPTION OF NATURAL RESOURCES

In particular, the call aims to:

- Contribute to the adaptation of existing tools (eg good practices, labels, standards) for sustainable consumption, production and exploitation of mineral and renewable organic materials. These tools will include new, scientifically sound criteria, which have been neglected so far (e.g. biodiversity and climate change related criteria)
- Explore alternative ways to traditional food production and consumption systems in Belgium and in Africa that are sustainable in environmental (including biodiversity and climatic) and socio-economic terms. A particular attention will be given to optimisation methods of soil fertility and biodiversity through agro-ecology. Identify obstacles and opportunities to the implementation of agro-ecology as alternative and transition food system.
- Develop scientific tools helping decision making in the choice of deployment of wind energy and photovoltaic and geothermal energy in Belgium.

2.1.4. TRANSNATIONAL THEMATIC CALL RESEARCH PRIORITIES

The programme enables participation in transnational programmes, such as the ERA-NETs and the Joint Programming Initiatives (JPI).

Bearing in mind the priorities of Pillar 1, the programmes and actions in which BELSPO participates in 2019-2020 are:

- JPI Climate (http://www.jpi-climate.eu)
  http://www.jpi-climate.eu/AXIS
- JPI Healthy and Productive Seas and Oceans (www.jpi-oceans.eu) and JPI Climate-
  Call on "Oceans and climate"
  The deadline for submitting proposals is on 14 June 2019 at 13:00 CEST
  http://www.belspo.be/belspo/organisation/Call/JPI_OceansClimate_2019_en.stm
- JPI Healthy and Productive Seas and Oceans (*www.jpi-oceans.eu)*
  Call on "Sources, distribution & impact of microplastics in the marine environment".
  http://www.belspo.be/belspo/organisation/Call/JPI_Oceans_2018_en.stm
  Selection process ongoing
- ERA-net BiodivERsA (www.biodiversa.org)
  call biodiversity and Health (selection process in progress)

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

2.1.5. NON-THEMATIC 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. These 2 or 4 year projects may or may not be implemented in collaboration with other national and/or African partners of a Least advanced African country, including other FSIs.

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 1.

2.1.6. NON-THEMATIC PHD 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.

These 4 year projects have to be **submitted by a FSI** and need to be implemented in collaboration with a Belgian university.

The projects do not have to be in line with the research themes in the context of the biennial calls, but must be linked to the general frame of Pillar 1. PhD proposals are nominative and the budget will be allocated to the FSI.

2.2. PILLAR 2: HERITAGE SCIENCE

2.2.1. GENERAL FRAME

The implementation of this pillar is done both via **thematic and non-thematic calls**. All research projects - thematic and non-thematic - will be coordinated by an FSI, possible 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 mission 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 (FSI : see annex 2) 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 humane 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.

2.2.2. GENERAL 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 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 in 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, policy support, societal).

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.

2.2.3. NATIONAL THEMATIC CALL RESEARCH PRIORITIES

INTERCONNECTION & VALORISATION OF LONG DATA SERIES

The Federal Scientific Institutions have collected or brought their expertise to the constitution of a wide variety of long data series of observations over different scales of time and/or space that have been (continuously) collected until now. These data series are related to geophysical, astronomical or environmental sciences, and to health management.

Projects will aim at the interconnection and/or valorisation of data series collected until now in order to gain new insights and a better understanding of living and non-living natural systems (earth and outer space) and their evolution by:

- Combining, interconnecting, valorising and/or exploiting these scientific data series, allowing to study possible impact on health, climate, or other natural risks. The considered data series shall be long enough to provide an extended view and to allow an in-depth understanding of the considered domain;
- Consolidating, whenever necessary, the existing archives by appropriate data management, quality control or addition of metadata to make them more homogeneous, findable, accessible, interoperable and re-usable;
- Developing, implementing or using suitable models when relevant in order to support these activities.

These activities will enable new synergies and cross-disciplinary collaborations between Belgian research teams, but also increase their visibility in related international programmes, enhance their competitiveness for future European calls and strengthen Belgium's position in international bodies.

Please note that though research on the interconnection of data is not an obligation, preference will be given to proposals combining interconnection and valorisation.

HEALTH: OLD SAMPLES - NEW INSIGHTS

Scientific collections of pathogenic strains, clinical samples and specimens, of animal, cultural, medical, epidemiological and societal inventories are being gathered and preserved through structured surveillance over a large time period. Large datasets and samples are stored and available, but under-analysed.

The application of new analytical methods and interdisciplinary approaches (i.e. for instance chemical, genetic, immunological, statistical analysis), analysis of datasets searching for new associations… will lead to the valorisation of these collections. But more importantly, they will allow a better understanding of the evolution, impact or outcome of the collections or of the concept/phenomenon to be investigated by means of these collections, e.g. in terms of related diseases. Ultimately, these efforts will have a positive impact on the comprehension of natural systems, societal or public health challenges.

Projects will aim at:

- A better understanding of underlying risk factors, cause of disease, cause of complications…
- Predicting societal or health outcome;
- A more efficient patient treatment and an optimization / reduction of health care costs; a more efficient handling, or a renewed interest of the inventories.

In this way, historical collections will be valorised to lead to an evidence based policy.

MERIDIONAL LOW COUNTRIES 15TH-18TH C.

The Federal Scientific Institutes hold a rich cultural heritage created between 1400 and 1800 in the Southern Netherlands and the Principality of Liege. From the Middle-Ages on, the Low Countries have been subjected to varied cultural influences, as witnessed by the collections of many FSIs. The scope of this research encompasses the study of this legacy within a broad context, linking material objects and / or historical sources to contemporary ideas, artistic traditions, and to their social environment.

The present call aims to develop scientific research projects based on the exploitation of federal collections in the following domains:

- Archives and history of public institutions (15th - 18th c.)
- Genesis of the modern State (15th - 18th c.)
- Art History and Musicology (15th - 18th c.).

INTER-BELLUM & WW II 1918-1950

The Federal Scientific Institutes hold a rich and diverse patrimony of the period going roughly from 1918 to 1950 and encompassing a period of political upheavals, a fast evolving society, rapid developments and increasing use of new technologies and therefore a succession of challenges in all fields. The tension between continuing traditions or creating new worlds, the challenges of a time where the aftermath became an in-between two wars, and the consequences of totalitarianisms and a Second World War have forged the world, Europe and Belgium until now.

The present call aims to foster research on these rich holdings and a cross- and interdisciplinary exploitation and valorisation of this federal heritage, building up on results of recent research on the First World War and its effects. It encourages proposals as well in political, historical, cultural, artistic, philosophical, sociological or natural science subject areas to unearth new findings. The projects must address one or several of the following topics:

- Reconstruction and restitution issues after World War I and II;
- Post-war mechanisms of socio-political pacification (including social care and social redistribution) and their long term effects;
- Foundation and development of modern intelligence services (since 1940);
- Punishment, financial sanctions, purges and re-education after collaboration (since 1944);
- Migration and migration politics between the wars;
- Changes of concepts and emerging new research fields in natural sciences and their reflexion in heritage (collections, documentations, methodologies);
- Changes in understanding and perception of heritage: issues of provenance, ownership, intellectual property rights concerning specific themes;
- Artistic and musical production(s), networks and movements, use of new (mixed) media, techniques and technologies and their related conservation issues;
- Exhibitions (including universal and international exhibitions), art market and collecting (in Belgium, organized by Belgians, with Belgian participation).

STRATEGIES FOR THE INTEGRATION OF FEDERAL DIGITAL DATA COLLECTIONS INTO OPEN SCIENCE DATA REPOSITORIES

Open Science[5] represents a new approach to the scientific process based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools. Open Science requires a new take on management, preservation and publication of research data and the creation of adequate data infrastructures.

The present call aims to examine methodologies, infrastructures and case-studies for the creation of open science data repositories and registries, and to ensure that the digital collections, already managed by the FSIs and universities, can be re-used in an (international) scientific context, where the connection of such data repositories is crucial for the valorisation of the federal collections. The process involves a profound strategy on data quality control, standardization and interoperability of metadata (e.g. IIIF and CIDOC-CRM implementation) and persistent identification of datasets to ensure findability, accessibility, interoperability, re-usability (FAIR-principles) and valorisation of the data repositories, also with reference to provenance research.

PRE-DIGITAL PHOTOGRAPHICAL COLLECTIONS MANAGEMENT & CONSERVATION

Our Federal Scientific Institutes own considerable photographical collections, still largely un-catalogued and inaccessible to the scientific world and a wider public. Their inherent fragility is a threat to their consultation and survival in the long term. Pre-digital photographical collections constitute a rich heritage that needs special management and conservation treatment to be preserved. They need to be catalogued and digitalised, allowing an access to the public without any risk of damaging them.

The aim of this research topic is to set up transversal research networks for sharing methodological approaches, knowledge and tools on this specific kind of material that will facilitate their conservation and / or their accessibility (through digital cataloguing).

[5] Open innovation, open science, open to the world - A vision for Europe, European Commission, 2016

PROVENANCE

The collections hosted by the Federal Scientific Institutions were created progressively several centuries ago, sometimes before the creation of the Belgian State. The acquisition modes and the provenance are highly variable: ancient purchases or donated private collections, field collections (Belgium, ancient colonies or foreign countries) by scientists, private persons, or by State representatives, by exchanges with other Belgian or Foreign Institutions, by sequestration...

The ethical and historical context has changed since the end of the 18th century. In some cases, the acquisition mode, the collection method, the motivation and the justification do not meet the current ethical standards or even legal criteria.

Today, the legitimacy of some collections is challenged by a number of communities. This questions the role of the Federal Scientific Institutions in the preservation of the Belgian State Heritage and in the scientific and/or societal valorisation of such collections:

- What is their scientific value?
- What is their historical significance?
- What is their societal relevance in Belgium and abroad?

Projects will aim at addressing the history of the objects and ethical, legal, scientific and logistic aspects in order to provide the best information to the competent authorities and to the actors of the society. All these aspects need to be explored and compared on the national and international levels using various case studies."

PRIVACY

Belgium is simultaneously lacking data to sustain its policies and scientific research, as well as a prospective reflection concerning the most efficient ways necessary to fulfil its immense retard. In a context that makes Big Data one of the essential pillars of the knowledge and collective worries in terms of digital security, cyber-crime and respect of fundamental rights (first and foremost the right to privacy), Belgium neither holds an evaluation of its situation, nor a diagnosis of its present and future needs, and has not a clear position regarding the technical, ethical and legal regulation that should frame the development of its policies in terms of collecting and preserving data.

This call aims to finance research concerning:

- Current and future strategic need of data for the Federal State;
- Technical and organisational modalities that would set the basis for federal action in the field;
- Ethic and legal rules that should frame such policies in a democratic context.

The objective should be the establishment of guidelines enabling Belgium to catch up by 2035.

2.2.4. TRANSNATIONAL THEMATIC CALL RESEARCH PRIORITIES

For this 2019 Pillar 2 call, there is no participation foreseen in transnational programmes, such as the ERA-NETs and the Joint Programming Initiatives (JPI).

2.2.5. NON-THEMATIC 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. These 2 or 4 year projects may or may not be implemented in collaboration with other national and/or African partners of a Least advanced African country, including other FSIs.

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.

2.2.6. NON-THEMATIC PHD 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.

These 4 year projects have to be submitted by a FSI and need to be implemented in collaboration with a Belgian university.

The projects do not have to be in line with the research themes in the context of the biennial calls, but must be linked to the general frame of Pillar2. PhD proposals are nominative and the budget will be allocated to the FSI.

2.3. PILLAR 3: FEDERAL SOCIETAL CHALLENGES

2.3.1. GENERAL FRAME

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

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.

2.3.2. GENERAL APPROACH

Applicants are invited to submit proposals in one of the two topics described below. These topics were selected by the Strategic Cell (composed of the representatives of the Prime Minister and Vice prime Ministers) in a longer list of topics. Therefore, they represent the most pressing issues for which scientific research can provide much needed answers at federal level.

We are seeking for research of the highest level that can enable researchers to innovate in current scientific debates and/or fill the knowledge needs expressed in these topics in concrete ways.

Applicants can choose to develop 2 or 4 year projects, according to the focus of their research lines, unless otherwise specified in the sub-topics developed. Projects that ambition to embrace a whole topic or sub-topic through a multitude of angles and disciplines of research, using a range of methods should best span over 4 years, while more focused projects, aiming at (a) specific angle(s) of approach or disciplines should best span over two years. Projects that can cross boundaries between the two topics of this call are welcome, but should be grounded primarily in only one of the two topics.

In any case, applicants should look at the projects previously funded by BELSPO (see on the BRAIN-be website for axis 4 and 5 of the programme) to avoid duplications and to generate critical mass by seeking for complementarities when possible.

2.3.3. NATIONAL THEMATIC CALL RESEARCH PRIORITIES

CHALLENGES AND OPPORTUNITIES OF THE 4TH INDUSTRIAL REVOLUTION

Context

Next to climate change, demographic change and globalisation, the digital revolution constitutes the 4th major trend that is shaping our world today. The digital revolution constitutes a disruptive technology that profoundly changes the way we produce and consume private and public goods and services. It enables peer to peer production of goods and consuming practices and brings with it new economic models that affect local markets. Robotics, the internet of things, block chain technology, machine learning, artificial intelligence... are transforming the development, the organisation and the conditions of work and life. It also modifies production and requested competences, expectations of citizens and the way they perceive and engage in private and public life. The digital revolution is clearly a source of opportunities, but it also carries its load of uncertainties and threats that scientific research can help better understand to support the federal state in the choices to make and measures to take.

One of the measures taken by the federal government is the Digital Belgium Plan, presented in 2015 by the Minister of Telecommunications. This plan draws the long-term vision for Belgium and concentrates on the following pillars: digital infrastructures, trust and confidence in the digital (security), skills and jobs in the digital world (50,000 new jobs are expected), the economy (1000 start-ups should see the light) and digital public services. This federal plan takes its place in European and regional plans (Industrie 4.0 in Flanders, Digital Wallonia and beDigital.Brussels).

Focus

Within the many questions that are raised by the digital revolution, researchers are invited to concentrate on the following points of interest for the federal state:

1. The **changing nature of work in the digital era**. Researchers are invited to examine the dynamics of work by considering for example the following aspects: How many jobs and workers are threatened by unemployment? Which sectors are characterized by an increase/decrease in jobs? What groups are affected? Are we experiencing a durable shift from employment under permanent contract to new forms of employment? What is the importance of lifelong learning and agility of competences and human

capital for workers who can benefit from the digital revolution as well as those who are at risk? What sorts of competences are needed? Which one should be developed? How are human resources policies (in the federal public sector and in the private sector) affected by block chains (already used in recruitment practices) and big data and what lessons can be drawn for the federal level? ...

Furthermore, the tensions and inequalities between categories of workers call for close examination by research. Could this evolution create new forms of work exclusion of strengthen current inclusion issues? Could the on-going polarisation endanger social cohesion? These questions can be examined by research projects of a duration of 2 or 4 years depending on the focus retained by applicants in their submission.

2. **Impact of the digital revolution on a number of federal policies**:

2.1. The implications of the digital revolution for the policies of regulation and protection of work and for social protection policies need to be better understood. We are concerned about the coverage of individuals in new forms of employment, on the risks to ensure workers against, in differential treatment of income from different sources (e.g. platform work vs. salaried employment, the sustainability of the funding (e.g. pensions) as jobs are automated and career patterns change. The changing nature of work (see point 1) raises the question of the way these policies can adapt and build a new social pact (one speaks of work and social protection 4.0[6]). These questions can be examined through interdisciplinary projects of 2 or 4 years according to the focus chosen in the applications.

2.2. In a context of a growth that is announced to be scarce in employment, the question of the universal basic income and/or a generalised reduction in working time, and the way it can be funded and implemented deserves attention, in light of experiences that are existing to enlighten the academic debate that is already well developed on this question in the academic field. Projects of two or four years could enable to examine this question, according to the focus chosen.

2.3. The impact of the digital revolution on a range of policies needs also to be better understood. Digitalisation profoundly affects basic concepts of international taxation. One of the consequences is for firms to be active on one market, to generate value added on this market without being physically present in the country. And since benefits are attributed depending on a physical presence in a given country, taxation might not be levied where the value added has been created. This problem is even exacerbated by certain business models that largely rely on intangible assets generating revenue flows between firms that are extremely difficult to value. Usual concepts of transfer prices are obsolete and this opens the door to tax optimisation. This is illustrated, for example, by the very low effective tax rates of the GAFA. It seems necessary to redesign the rules of international tax policies. This work is on-going but it seems necessary to better apprehend the consequences of the different models that are discussed for Belgium. It is also necessary to revisit taxation systems on labour and wealth, in light of the (r)evolution of work discussed above. It is also notable that Belgium offers favourable tax rates for workers who use platform work as an occasional income source. Has this measure had the desired effect? Are there unintended side effects and can the measure be viable in the long run if this type of work continues to grow? Beyond tax policies, the problem of localisation also raises a re-appraisal of other policies that can be the focus of proposals, such as social security, police and security...

2.4. The impact of the digital revolution on internal administrative processes and the delivery of public services: (big)[7] data, Artificial intelligence and public provision. Policymakers in various parts of government are exploring new forms of data and new ways of analysing it, anticipating that it might lead to better public policies. Administrations are also exploring how these developments can lead to revised internal processes. The hope is that data analytics – the analysis of big data ('high volume, high velocity and/or high variety information assets that require new forms of processing to enable enhanced decision-making, insight discovery and process optimization') will inform strategic priorities, enable more targeted

[6] See for example the recommandations du Conseil supérieur de l'Emploi in its 2017 report.
[7] We have put the term "big" in brackets as existing data (or the lack of it) and its analysis to improve or monitor public policies is a topic in itself that falls in the remits of this call.

policy measures and permit more robust monitoring and evaluation of policy impacts. We invite applicants to explore how (big) data could be used to enable better public provisions for the federal state, what elements are hindering the development of using big (public) data in policies (from legal aspects, to trust, ethics and equity to the public and internal human competencies and process adaptations...), revisit the meaning of using (big) data with respect to public functions (e.g. the role of judges and their independence in the judicial system, the transparency of public actions against the possibilities offered by (big) data) and develop, if possible, a proof of concept for a given provision, in close cooperation with federal public services. We believe that projects of two years would enable to provide new -or better - tools and recommendations to federal public services.

DISCRIMINATION, POVERTY AND UNEQUAL OPPORTUNITIES

Context

The federal government is working towards a fairer society by addressing situations of inequality affecting the weakest and most disadvantaged (groups of) people in society and by combatting the various forms of discrimination experienced by certain citizens.

It seeks firstly to ensure that people are able to live in dignity (notably, by increasing minimum and replacement incomes, strengthening the legislative framework against victims of violence and discrimination...) and secondly, it assists excluded people towards a full reintegration in society (through formulas for activating and accompanying the efforts of the persons concerned).

The BRAIN-be programme has already encouraged research in support of these themes. But in order to reach a critical mass in the funded projects and also to meet new political orientations, this topic remains opens for additional questions to explore. These questions mainly revolve around **discrimination**, **poverty** and **unequal opportunities**. These thematic priorities focus primarily on these multifaceted phenomena, the factors reducing or aggravating them, and the effectiveness of federal public policies that address them.

Unless otherwise stated, research projects will have a duration of 2 or 4 years, at the choice of the PI.

Focus

Principal investigators are invited to submit projects by considering the following focus points of this call. Furthermore, they are encouraged to mix elements from different bullet points and look at the issues at stake from multiple/different angles.

- The federal anti-discrimination legislation includes **19 protected criteria**[8] **(or grounds for discrimination)** whose relevance, evolution over time and relative importance should be questioned by research. Is the list of criteria/grounds comprehensive in today's world?
- With regards to **federal social public policies**, do public measures aimed at combatting discrimination deliver the expected results for the target groups? What is the impact of such discrimination on the health and well-being, quality of life, education, employment... of these groups? How can the target groups be **better mapped**? What administrative, civil or criminal consequences are given to complaints filed (with police, judicial, administrative authorities, or even reports to Unia) and what mechanisms (mediation, training, financial sanctions, deprivation of liberty, etc.) are favoured?
- The neutrality of federal public policies, their effectiveness and universality or side-effects, for the targeted beneficiaries should be examined. More specifically, the federal government's ability to provide, through its social policies, fair and non-discriminatory treatment for beneficiaries of social benefits could be examined in terms of possible discriminatory unwanted effects. The issue

[8] For a list of the 19 protected criteria: https://www.unia.be/en/grounds-of-discrimination/the-19-grounds-of-discrimination. The racial criteria are: presumed race, skin colour, nationality, ancestry (Jewish origin) and national or ethnic origin.

of the digital divide can be examined in this context, as can the issue of the non-take-up of these benefits in a context where the automation of rights as a response provided by the federal government (but to what extent?) to eliminate any discrimination could precisely deepen this digital divide. Moreover, the complexity of procedures at the federal, regional and local levels can add hurdles that can be hard to overcome for vulnerable groups. How can this complexity be better managed (for all actors) in order to minimize negative impacts on the non-use of benefits and to better reach target groups? The social institutions set up and implementing these policies must also be studied in the light of the discrimination they could engender, in particular in the work of case managers and the discretionary margin they benefit in treating their cases. In this context, a benchmarking of social institutions would be welcome in order to allow the implementation of corrective measures. (Projects on the non-take-up of social rights, the digital divide and the case managers will have a duration of 2 years.)

- As far as the neutrality of federal public policies is concerned, the impact of social security and social assistance legislation on equal opportunities could be the subject of a particular focus, for example in the context of cohabiting status, new forms of blended family, residence or migration status, (chronic, physical, mental) diseases...
- The question of access to public service for precarious groups can also be studied in the case of the justice system, more precisely their access to appeal and/or court proceedings. On the one hand, what obstacles must precariously litigators overcome? On the other hand, are public aid schemes effective in compensating for these handicaps? Does justice play a real role as a shield to restore the rights of the weakest and how can this role be strengthened? In addition, to what extent do public policies favour reparations for damage suffered by victims? The judicial system also exercises jurisdiction over vulnerable groups of the population. To what extent do judicial interventions take deprivation into account? Do some devices accentuate the deprivation of litigants? How effective are the accompanying measures aimed at rehabilitating or even avoiding recidivism?
- Discrimination in relation to the living place is a dimension that is often overlooked in practice and insufficiently studied. Some already socially vulnerable groups of the population are more exposed to environmental risks in their living (or social) environment (pollution, vandalism and violence, lack of access to green spaces, etc.). Whether the result of discriminatory (housing) market policies or the ineffectiveness of public policies, it is important to study the extent of this problem in Belgium, and develop and implement tools to ensure that these groups are treated fairly.
- Does Belgium have effective "stabilizers" (income policy, wage negotiation process, market regulation, social protection system, sectorial social dialogue...) to overcome shocks? To what extent can these institutional elements specific to Belgium explain Belgium's international position in terms of inequality and its evolution? What lessons can be learned from the 2008-2009 crises? Are there any other recent crises that need to be taken into account when it comes to public action to promote equal opportunities, in particular access to employment?
- The dynamics in and out of poverty must be better understood. From 2011 to 2017, the poverty rate in Belgium only rose from 15.3% to 15.9%[9]. What can this relative stability hide? Is precariousness a temporary situation or not? What factors play a role in a possible trap? What are the levers for an exit from this stalemate? How (better) to support and motivate people in precarious situations? How to ensure that public authorities, associative actors and private sector can support a path that includes both objective (in terms of the provision of opportunities and other structural conditions) and subjective support (psychological and behavioural, to promote self-confidence, autonomy and a capacity to seize opportunities)? Moreover, quantifying poverty raises the question of invisible poverty and of the most vulnerable groups from that point of view.
- People, who are left out of the labour market owing to long-term unemployment, chronic illness, fragile mental health..., are at great risk of poverty. The federal government has put in place social participation and social activation formulas to increase the autonomy of individuals. Are

[9] Source : Statbel (Direction générale Statistique - Statistics Belgium) : EU-SILC 2017.

these efforts sufficient? Do they achieve their objective? Does the trajectory approach work from this point of view? How can the actors be encouraged/supported in order to develop an effective social activation policy? How can target populations be prevented from being stuck in ad hoc actions for too long? How can we encourage them to work together? What is the impact of contractualizing the rights and obligations of users of administrative services? Does this approach reach its goal, namely to support the social and professional integration of minimum (vital) income recipients, but also to make them independent according to conditions coupled with this support? What is the expected impact on the risk of poverty, especially for low-skilled workers, of the trend towards more declining unemployment benefits? What are the options for achieving better social inclusion of the most vulnerable groups, often dependent on a single replacement allowance, due to the low level of benefits and limited opportunities to end this dependency? (Projects on activation policies will have a duration of 2 years).

- Moreover, many people who are active in the labour market remain close (or even below) to the poverty line. Having work no longer automatically means no deprivation or poverty. How do we look at this in the long term and in an intergenerational perspective? The increasing risk of poverty among low-skilled people is an important political challenge. How can our social protection system address this challenge for less productive groups? In what way could it respond to the dysfunctions of the labour market vis-à-vis these groups? The quality of available jobs also remains a major concern for workers. Choices must be made in the household expenditure on a daily basis. Health care, medicine, dentist, education, recreation, nutrition... priorities must be determined. How are these choices made? What are the consequences?
- The financial or monetary aspects of poverty can be addressed. Income protection is no longer just a task for social security. On the one hand, the Government Agreement provides for an increase in minimum benefits for the poverty line. What impact would an increase in the minimum disability benefit have on the current disability system in terms of accumulating work income and benefits? What about the advantages, limitations, unintended effects, and conditionality (e.g. minimum wages) of benefits and their accumulations? On the other hand, the introduction of the Low Labour Income Tax Credit in 2001 reflects the growing role of taxation. What can be expected from an increasing attention to (para-)tax law? What are the benefits, limitations, unintended effects, prerequisites? What is the expected impact on the risk of poverty?

2.3.4. TRANSNATIONAL THEMATIC CALL RESEARCH PRIORITIES

The programme enables participation in transnational programmes, such as the ERA-NETs and the Joint Programming Initiatives (JPI).

Bearing in mind the priorities of Pillar 3, the programmes and actions in which BELSPO participates is:

- NORFACE (https://www.norface.net/) has launched a call dedicated to "democratic governance in a turbulent age" in december 2018. BELSPO has committed a budget of 500k€ that shall be used in 2020.

The participation of BELSPO to a second international programme is still under investigation. It concerns the JPI Climate (http://www.jpi-climate.eu) initiative, namely the call SOLSTICE dedicated to SSH and Climate change. Pillar 3 could be engaged in this call up to a budget 250k€ (this budget would then be spent in 2020). This call is expected to be launched in September 2019, depending on the decision of BELSPO.

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

3. GUIDELINES FOR INTRODUCING A PROPOSAL - CONTENT

This proposal will be submitted in English and formulated concisely, avoiding abbreviations. The font used must be Calibri, size 11 with 1.15 line spacing. If applicable, the empty / non applicable points may be deleted.

3.1. EXPRESSION OF INTEREST

An expression of interest needs to be submitted **only for Pillar** 3.

Prior to submitting a proposal within Pillar 3 for national thematic projects, applicants **must** first submit an expression of interest (EoI). If the EoI has not been submitted in time, it will be impossible to submit a final proposal. This EoI is asked for sourcing the right expertise. It does not constitute a step in the evaluation process.

Within this EoI, the project coordinator is invited to briefly describe the project at this stage of the reflexion. The title and acronym need to be the same as in the final proposal and the core of the final project cannot diverge from the initial description in such a way that the mobilised expertise becomes irrelevant.

Deadline for the Expression of Interest: 22 July 2019 – 23h59

3.2. PROPOSAL SUMMARY

To be completed for **all project types.**

The summary must include the following:

- Context and motivation for the realisation of the project
- What the realisation of the project will achieve on the scientific, societal and/or policy-making level
- Brief explanation of how the project will be carried out
- Expected results

3.3. PROPOSAL PARTNERS

3.3.1. NATIONAL THEMATIC INTERDISCIPLINARY PROJECTS

Each national thematic proposal is submitted by a **network**, belonging to at least two different Belgian scientific institutions.

The network partners must conduct complementary activities, through different disciplinary angles (interdisciplinarity), related to a common issue and the integration of achieved results.

All funded teams will jointly share all obligations and responsibilities during the implementation of the project. The contributions of the different network partners may differ according to the content.

Accordingly, different partners may receive different shares of the total budget and devote different numbers of person-months to the research, provided they all bear in mind the principles of a network project.

The call is intended for Belgian university institutions, university colleges, public scientific institutions, non-profit research centres.

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

The participation of **Federal Scientific Institutions** and the cooperation between partners from **different Communities** is encouraged. In case of equal scientific quality between the proposals submitted, preference will be given to consortiums in which one or more FSIs are involved.

The programme allows for cooperation with **African partners of Least advanced African countries**[10]. These African partners can benefit from financing that amounts to a maximum of 20% of the total budget of the project.

A **coordinator** (belonging to a Belgian research institute) must be designated in each proposal. In addition to his/her scientific and management qualifications, the project coordinator must be able to:

- 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 interfere with the correct 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 programme promotes equality between men and women in research. The projects should therefore take this into account in the choice of the researchers.

3.3.2. NON-THEMATIC BOTTOM-UP PROJECTS

Only for **Pillars 1 and 2**.

Only **Federal Scientific Institutions** (FSI) can submit a bottom-up project. These 2 or 4 year projects may or may not be introduced in collaboration with other national and/or African partners of a least advanced African country, including other FSIs.

In case the project is carried out by multiple partners, these must conduct complementary activities related to a common issue and the integration of achieved results.

All funded teams will jointly share all obligations and responsibilities during the implementation of the project. The contributions of the different network partners may differ according to the content. Accordingly, different partners may receive different shares of the total budget and devote different

10 https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf

numbers of person-months to the research, provided they all bear in mind the principles of a network project.

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

The programme allows for cooperation with **African partners of Least advanced African countries**[11]. These African partners can benefit from financing that amounts to a maximum of 20% of the total budget of the project.

3.3.3. NON-THEMATIC PHD PROJECTS

Only for **Pillars 1 and 2**.

These projects have to be submitted by a **Federal Scientific Institution** (FSI). The FSI coordinator is the person in charge of the PhD candidate at the FSI. The FSI coordinator will validate and introduce the PhD project proposal. PhD proposals are nominative and the budget will be allocated to the FSI.

The PhD candidate is the person who will accomplish the research, leading to the completion of a PhD. The PhD candidate is not required to belong to a FSI.

Each PhD project needs to be implemented in collaboration with a Belgian university. The university promoter is the person in charge of the PhD candidate at the university.

The submission form has to be signed by the FSI coordinator, the PhD candidate and the university promoter. By signing the PhD proposal, the FSI coordinator and university promoter engage themselves to direct the PhD thesis of the candidate. The PhD candidate engages him/herself to complete the PhD thesis within the frame of the project.

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

3.4. PROJECT DURATION

The projects selected within the context of the current call will start mid-December 2019 or mid-January 2020.

The proposers of a national thematic project and/or a non-thematic bottom-up project can choose for a research project of 2 or 4 years.

The non-thematic PhD projects have a duration of 4 years.

3.5. EXPECTED IMPACT OF THE RESEARCH

To be completed for **all project types.**

11 https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf

Explain the expected impact of the implementation of the research results, and how the research deliverables will possibly influence scientific knowledge and knowledge transfer, sustainability, economy, decision making, ...:

- For the FSI (in relation to their missions)
- For the scientific / research community
- At societal level / society in general
- In support of (future) federal policy / policy makers

Estimate the relative importance accorded by the project to the three types of impact (in percentage for a total of 100%):

- Science
- Policy
- Society

Demonstrate the compliance of the project - methodology including the valorisation and dissemination tasks - with the addressed expected impacts.

3.6. PROPOSAL BUDGET

3.6.1. NATIONAL THEMATIC PROJECTS

Within a national thematic project, the participation and budget allocation needs to be balanced among the various project network partners.

It is possible to add non-funded Belgian partners to the project.

Given the coordinator's duties and responsibilities, the coordinator must at least apply for a staff budget.

To guarantee the spirit of a network, at least one partner from a different Belgian scientific institution must apply for personnel or operating budget.

The project budget is reserved exclusively for the project activities.

The different categories of expenditure financed by BELSPO are:

Staff: Pre-tax wages associated with increases in the cost of living, employers' social security and statutory insurance contributions, as well as any other compensation or allowance due by law and secondary to the salary itself and tax-free scholarships. Tax-free scholarships refer to a grant subject to a tax exemption under the tax laws. BELSPO prefers staff to be hired under a labour contract.

The staff costs are limited to a maximum amount of:

- 66.000 €/year for a scientist with a Master's degree (regardless of years of experience)
- 90.000 €/year for a scientist with a PhD (regardless of years of experience)
- 50.000 €/year for a technician (regardless of years of experience)

Those amounts are not applicable to persons that are identified by name in the proposal.

At least 60% of the total proposal's budget has to be devoted to staff.

General operating costs: this includes all current expenditures related to the project's implementation such as usual supplies and products for the laboratory, workshop and office, documentation, travel and accommodation, use of IT facilities, software, organisation of meetings, workshops and events, etc. The

total amount of these operational costs is set at a flat rate of 15% maximum of the staff budget for the coordinator and 10% maximum of the staff budget for the other partners.

Specific operating costs (invoices will be required): this includes specific operating costs not covered by the general operating costs such as costs for analysis, maintenance and repair of specific equipment purchased by the project, surveys, ...

Overheads (***only for the Belgian partners***): Institutions' general overheads that cover, in one lump sum, administration, telephone, postal, maintenance, heating, lighting, electricity, rent, machine depreciation, and insurance costs. The total amount of this item is set as 5% of the total staff and operating costs.

Equipment (***only for the Belgian partners***): Purchase and installation of scientific and technical apparatus and instruments, including computer hardware. Equipment needs to be purchased in the first half of the project.

Subcontracting (***only for the Belgian partners***): Expenses incurred by a third party to carry out tasks or provide services that require special scientific or technical competences outside the institution's normal area of activity. The amount may not exceed 25% of the total budget allocated to the Belgian partner concerned.

The total requested budget for the **African partners of a Least advanced African country** may **not exceed 20% of the total proposal's budget** and may only cover staff and operating costs.

3.6.2. NON-THEMATIC BOTTOM-UP PROJECTS

The project budget is reserved exclusively for the project activities.

The different categories of expenditure financed by BELSPO are:

Staff: Pre-tax wages associated with increases in the cost of living, employers' social security and statutory insurance contributions, as well as any other compensation or allowance due by law and secondary to the salary itself and tax-free scholarships. Tax-free scholarships refer to a grant subject to a tax exemption under the tax laws. BELSPO prefers staff to be hired under a labour contract.

The staff costs are limited to a maximum amount of:

- 66.000 €/year for a scientist with a Master's degree (regardless of years of experience)
- 90.000 €/year for a scientist with a PhD (regardless of years of experience)
- 50.000 €/year for a technician (regardless of years of experience)

Those amounts are not applicable to persons that are identified by name in the proposal.

At least 60% of the total proposal's budget has to be devoted to staff.

General operating costs: this includes all current expenditures related to the project's implementation such as usual supplies and products for the laboratory, workshop and office, documentation, travel and accommodation, use of IT facilities, software, organisation of meetings, workshops and events, etc. The total amount of these operational costs is set at a flat rate of 15% maximum of the staff budget for the coordinator and 10% maximum of the staff budget for the other partners.

Specific operating costs (invoices will be required): this includes specific operating costs not covered by the general operating costs such as costs for analysis, maintenance and repair of specific equipment purchased by the project, surveys, ...

Overheads (***only for the Belgian partners***): Institutions' general overheads that cover, in one lump sum, administration, telephone, postal, maintenance, heating, lighting, electricity, rent, machine depreciation, and insurance costs. The total amount of this item is set as 5% of the total staff and operating costs.

Equipment (***only for the Belgian partners***): Purchase and installation of scientific and technical apparatus and instruments, including computer hardware. Equipment needs to be purchased in the first half of the project.

Subcontracting (***only for the Belgian partners***): Expenses incurred by a third party to carry out tasks or provide services that require special scientific or technical competences outside the institution's normal area of activity. The amount may not exceed 25% of the total budget allocated to the Belgian partner concerned.

The total requested budget for the **African partners of a Least advanced African country** may **not exceed 20% of the total proposal's budget** and may only cover staff and operating costs.

3.6.3. NON-THEMATIC PHD PROJECTS

The project budget is reserved exclusively for the project activities and will be allocated to the FSI.

The different categories of expenditure financed by BELSPO are:

Staff: Corresponds to the salary of the Candidate. Pre-tax wages associated with increases in the cost of living, employers' social security and statutory insurance contributions, as well as any other compensation or allowance due by law and secondary to the salary itself and tax-free scholarships. Tax-free scholarships refer to a grant subject to a tax exemption under the tax laws. BELSPO prefers staff to be hired under a labour contract.

At least 60% of the total proposal's budget has to be devoted to staff.

General operating costs: this includes all current expenditures related to the project's implementation such as usual supplies and products for the laboratory, workshop and office, documentation, travel and accommodation, use of IT facilities, software, organisation of meetings, workshops and events, etc. The total amount of these operational costs is set at a flat rate of 10% maximum of the staff budget.

Specific operating costs (invoices will be required): this includes specific operating costs not covered by the general operating costs such as costs for analysis, maintenance and repair of specific equipment purchased by the project, surveys, ...

Overheads: Institutions' general overheads that cover, in one lump sum, administration, telephone, postal, maintenance, heating, lighting, electricity, rent, machine depreciation, and insurance costs. The total amount of this item may not exceed 5% of the total staff and operating costs.

Equipment: Purchase and installation of scientific and technical apparatus and instruments, including computer hardware. Equipment needs to be purchased in the first half of the project.

Subcontracting: Expenses incurred by a third party to carry out tasks or provide services that require special scientific or technical competences outside the institution's normal area of activity. The amount may not exceed 25% of the total budget allocated to the Belgian partner concerned.

3.7. DESCRIPTION OF THE PROPOSAL

3.7.1. GENERAL PURPOSE OF THE PROPOSAL

To be completed for **all project types.**

SCOPE AND OBJECTIVES

Define the scope and objectives of the proposal by explaining:

- The context in which the research is framed
- The state of the art
- The importance of its realisation

Include all the references to publications that support and justify the project.

Describe the opportunities for (new) national and/or international collaborations.

INNOVATIVE CHARACTER - ORIGINALITY IN RELATION TO THE STATE OF THE ART

Define the innovative character of the project, its originality and added value with respect to similar national and/or international activities and initiatives - existing or in preparation at the level of:

- The research environment / fields
- The Federal Scientific Institutes
- Society
- Policy-making.

3.7.2. COMPLIANCE WITH TH SCOPE OF THE CALL / PILLAR OBJECTIVES

To be completed for **all project types.**

Explain/justify how the proposal:

- Answers and makes a scientific contribution to the research priorities of the call (for **national thematic projects**) or the general frame of the Pillar (for **non-thematic projects**);
- Makes use of interdisciplinarity at the level of:
  - mobilised scientific disciplines,
  - and / or the integration of methodological approaches
  - and / or the various ways to apprehend the studied topics
  - ...

3.7.3. METHODOLOGY, PARTNERSHIP AND DATA

METHODOLOGY AND FEASIBILITY

To be completed for **all project types.**

Describe and motivate the used methods, techniques, systems and/or way of working that will be used in order to achieve the results, and in what way they will allow to accomplish the objectives of the project.

Describe the project's feasibility with regard to available resources, timing, identified problems and opportunities, identified deliverables and requirements, ...

Explain which are the incurring risks in case the project is not realised or fails. For example:

- Absence of scientific evidence to support policy-making
- Not meeting EU or international standards / regulations…
- Irreversible degradation or loss of certain materials / works of art / the environment…

Elaborate the actions to contain / reduce those risks.

ADEQUACY OF THE PARTNERSHIP COMPOSITION

National thematic and non-thematic bottom-up projects

Each financed project partner must provide the following, in a clear and precise manner:

- Their professional background.
- Their top 5 best publications that concern the subjects covered in the proposal (indicate clearly the publications accepted by international peer reviewed journals).
- A list of the research projects carried out over the past five years in the field under consideration or related areas (specify the duration of the work and funding source).
- A list of their (inter)national contacts and the (inter)national networks to which they belong within the context of the proposal.
- The management skills of the coordinator.

If possible, include weblinks.

In case a proposal is introduced by a network, justify its composition (complementarity, interdisciplinarity) and if applicable the added value of the collaboration with African partners of Least advanced African countries for the project and for the development of Belgian expertise taking into account the existing knowledge/expertise in Belgium.

Describe how the gender issue is taken up in the project partnership or justify why it could not been taken into account (budget, needed expertise...).

Non-thematic PhD projects

The FSI-university collaboration should be developed by providing:

- Their role in the project
- Their research coordination
- Their potential collaboration with other institutes
- Their future prospects of collaboration as a result of the PhD project

PhD candidates must provide their CV. Should the candidates wish to furnish any document which justifies, for instance, the acquired degrees or certificates, their trajectory at the university, their professional experience, languages or other skills, they are welcome to include them at the end of the pdf file in the part "Annexes".

The FSI coordinator and university promotor must provide the following information, in a clear and precise manner:

- Their professional background
- Their top 5 best publications that concern the subjects covered in the proposal (indicate clearly the publications accepted by international peer reviewed journals).
- A list of the research projects carried out over the past five years in the field under consideration or related areas (specify the duration of the work and funding source).
- A list of their (inter)national contacts and the (inter)national networks to which they belong within the context of the proposal.
- Their supervising experience.

If possible, include weblinks.

Describe how the gender issue is taken up in the project partnership or justify why it could not been taken into account (budget, needed expertise...).

REQUIRED DATA AND DATA MANAGEMENT PLAN

To be completed for **all project types.**

Required data

Describe the kind, scope, availability and possible cost of the data-sets needed for the project.
In case new data needs to be gathered, describe and justify its necessity, added value and methodology.

Concerning the use of existing data/samples or the collection of new data/samples, proposal submitters should take the following guidelines into account:

- Whenever possible, the partners should make use of existing (administrative or non-administrative) databases/collections to meet the needs of their research. For this, they must check beforehand whether the data/collections are accessible, at what cost, and how much time it will take to acquire the data. If, after the start of the research, it appears that due to partner negligence or insufficient knowledge of the field, the data files/collections will not be available in time, this may constitute a reason for BELSPO to cancel the contract. It is recommended the submitters line-up alternatives in order to carry out the project in case the foreseen data/samples are not available.
- If the proposal requires collecting new data/samples (e.g. via a survey), the team must justify with clear and convincing arguments its choice of methodology, referring to the objectives of the study and specifying why this particular form of data/sample collection is required and preferable to other approaches. This means the proposers must provide sound and detailed argumentation in support of the chosen methodology (sampling, etc.) and highlight its added value in comparison to existing databases/collections. In addition, the partners must provide the budget required for this data/sample collection.
- If the project needs earth observation data, BELSPO's space research and applications service can provide them on the basis of a justified request (see http://eo.belspo.be)

Data management plan

Data Management Plans (DMPs) are a key element of good data management.

As the data collected within the framework of the proposed research must be available to other users for other purposes, the proposal must clearly indicate when and in what format the data will be made accessible, specifying which categories of users are likely to benefit from access to the data.
Develop a Data Management Plan (DMP), in which is specified what data will be open, detailing what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

As part of making research data findable, accessible, interoperable and re-usable (FAIR), a DMP should include information on:

- The handling of research data during & after the end of the project
- What data will be collected, processed and/or generated
- Which methodology & standards will be applied
- Whether data will be shared/made open access and
- How data will be curated & preserved (including after the end of the project). In this respect, researchers shall use to the maximum existing platforms having the highest standard of preservation, curation, deposit and reuse. The State Archives of Belgium (ARA/AGR) can be contacted as managers of the SOHDA (Social and Humanities Data Archive) data repository.

3.7.4. WORKPLAN - DELIVERABLES - VALORISATION

NATIONAL THEMATIC AND NON-THEMATIC BOTTOM-UP PROJECTS

Description

Describe and justify the work plan and the proposed approaches in relation to the state of the art, including:

- The tasks of all partners (if applicable) in detail, including numbering, name and responsible for the tasks in accordance with the timetable. The description of tasks covered by the African partners of Least advanced African countries, the non-financed partners, the possible subcontractors and co-financing third parties, should also be included.
- The means, tools, procedures ... for the integration of the partners' contributions, for the overall organisation, timing, coordination, … of the project.
- The valorisation, dissemination and communication activities. These must include **concrete proposals for valorisation, dissemination and communication** of the research and the research results. This might involve, for example, the organisation of thematic debates and meetings, proposals for disseminating and popularising the results, proposals to integrate data into computerised databases on national and international levels, oral communications on conferences, workshops, exhibition, ..., the elaboration of targeted messages intended for experts, policy-makers or managers regarding the content of specific results, including its limitations, the related uncertainties, the hypotheses and methods used, written and/or publications (articles, papers, books chapters , reports), etc. The target groups of these valorisation proposals must be explicitly described.

The work plan can be detailed to the level of work packages (WP) and tasks (Tasks). The definition of sub-tasks is not possible.

Describe in detail the expected research results and deliverables.

Note: For **Pillar 3**, applicants shall also include in the first months of the project a **specific valorisation activity** consisting in providing a document developing the state of the art in the topic studied. This document should enable decision-makers and other stakeholders to gain easy insights in what is already known at the research level on the subject.

Timetable

Fill in the Gantt chart on the online platform or create and upload a proper table with the same information as in the Gantt chart in accordance with the work plan and the detailed description of the tasks. Include all tasks (including valorisation and dissemination activities).

Include all involved partners, including the possible African partners of the Least advanced African countries, non-financed partners, possible subcontractors and co-financing third parties.

Quantify the workload in terms of funded person-month.

NON-THEMATIC PHD PROJECTS

Description

Describe and justify the work plan and the proposed approaches in relation to the state of the art, including:

- The tasks in detail, incl. numbering and name of the tasks in accordance with the timetable. The description of tasks covered by possible non-financed partners (including African partners of Least advanced African countries), possible subcontractors and/or co-financing third parties, should also be included.
- The means, tools, procedures ... for the overall organisation, timing, coordination, … of the project.
- The valorisation, dissemination and communication activities. These must include **concrete proposals for valorisation, dissemination and communication** of the research and the research results. This might involve, for example, the organisation of thematic debates and meetings, proposals for disseminating and popularising the results, proposals to integrate data into computerised databases on national and international levels, oral communications on conferences, workshops, exhibition, ..., the elaboration of targeted messages intended for experts, policy-makers or managers regarding the content of specific results, including its limitations, the related uncertainties, the hypotheses and methods used, written and/or publications (articles, papers, books chapters , reports), etc. The target groups of these valorisation proposals must be explicitly described.

The work plan can be detailed to the level of work packages (WP) and tasks (Tasks). The definition of sub-tasks is not possible.

Describe in detail the expected research results and deliverables.

Timetable

Fill in the Excel table in accordance with the work plan and the detailed description of the tasks. Include all tasks (incl. the meetings with the follow-up committee and valorisation and dissemination activities).

If applicable, include non-financed partners, subcontractors and/or co-financing third parties.

Quantify the workload in terms of funded person-month.

3.7.5. FOLLOW-UP COMMITTEE

To be completed **only for national thematic projects and non-thematic bottom-up projects**.

Each selected project is accompanied by a follow-up committee. The objective of this committee is to provide an **active follow-up** of the project and to assist **valorising the research**. It will carry out this role through the exchange and provision of data and information, giving advice, suggesting possibilities to valorise the research, etc. The follow-up committee is composed of **potential users of the results**, such as representatives of public authorities at national, regional, European, or international level, social actors, scientists, industrial actors, etc. The members of the follow-up committee are non-funded.

It is up to the candidates to specify in their proposal the functioning and specific goals of the committee (number of meetings, method of information exchange, etc.), and the role and profiles of its members.

To the extent possible, members will be identified by name and, if applicable, will express their interest and possible contribution to the project. If relevant for the proposal, the applicants may contact the Federal departments via the contact list in annex 3.

The final composition of the follow-up committee will be defined in collaboration with BELSPO.

3.7.6. GENDER AND ETHICS

To be completed for **all project types.**

Describe and specify how the gender dimension, if relevant, is taken into account in the research topics.

Describe how the project and its research takes into account or includes ethical issues such as sustainability, animal welfare, environmental respect, informed consent of the studied population ...

If for methodological, budgetary or other reasons those aspects are not taken into consideration a justification is required.

3.8. ANTARCTICA CAMPAIGN BUDGET (IF APPLICABLE)

In addition to the financing of the project, BELSPO will take care of the real expenses of the **researchers of Belgian Institutions employed by the project** for taking part in field work campaigns in Antarctica.

These campaigns costs must not be budgeted in the overall budget tables of the proposal.

Expenses which are reimbursed by the State within the context of these campaigns cover: (i) travelling costs and stay and (ii) transportation and insurance of their scientific equipment. All other costs should be included in the overall project budget.

The campaigns should be explained in the detailed description of the tasks and timetable.

3.9. POTENTIAL NON BELGIAN EXPERTS FOR THE EVALUATION OF THE PROJECT

To be completed for **all project types.**

The applicants must propose 4 to 6 scientific experts capable of evaluating the proposal.

The experts must meet the following criteria:

- Be outstanding and internationally well recognized in their research field
- Be able to evaluate as much as possible all the aspects covered by the proposal
- Be foreign (European) experts not working or living in Belgium
- Not belong to the same institution as the foreign partner
- Have no direct link with the network
- Have no co-publications with any of the partners within the last 5 years

It is up to BELSPO's consideration to appeal to any of the proposed experts.

The applicants may also list 1 non-grata expert who will then not be used by BELSPO in the evaluation process.

4. PROCEDURES

This chapter describes the procedures for submitting a proposal, the project selection procedures, and the principal contractual obligations applying to selected projects.

4.1. HOW TO ANSWER TO THIS CALL FOR PROPOSALS?

The EoI (only for Pillar 3) and the proposals must be electronically created, elaborated and submitted via the BRAIN-be 2.0 online submission platform.

Access to the platform via the link: https://brain-be.belspo.be

Detailed guidelines explaining the technical issues related to the online submission procedure can be found on the online submission platform. Please read these guidelines carefully and follow them step by step.

4.1.1. EXPRESSIONS OF INTEREST

Researchers wanting to introduce a proposal within the Pillar 3 call for national thematic projects, must first submit an expression of interest (EoI). These expressions of interest will only be used by BELSPO to seek foreign experts for the evaluation of the research proposals.

The expression of interest must be submitted no later than 22 July - 23h59. Submitting an EoI before the deadline is an eligibility condition to submit a full proposal.

4.1.2. PROPOSAL

The proposals must be submitted no later than 2 September – 23h59

4.2. EVALUATION AND SELECTION

4.2.1. SELECTION PROCEDURE

The selection of projects is based on an evaluation that guarantees scientific excellence and the alignment of the projects with federal priorities. The evaluation runs in two phases:

Phase 1 - peer review organised and coordinated by BELSPO

BELSPO organises and coordinates a scientific evaluation of each proposal by four foreign peers. The principles of this evaluation are the same for the 3 Pillars: the evaluation takes place in two steps: an individual written evaluation followed by a panel meeting.

Phase 2 - selection proposal formulated by the Advisory Committee

Transparency of the evaluation process is guaranteed by submitting the peer review results to the respective Advisory Committees. This also guarantees a stronger substantiation of the choices made.

Based on the consensus report and the funding proposal prepared by the peer review panels, the Advisory Committees will formulate a definitive selection proposal.

The selection decision is made by the Minister of Science Policy on the basis of the definitive selection proposal formulated by the Advisory Committees.

4.2.2. EVALUATION

The text of the call for proposals serves as the basis for evaluating and selecting the proposals.

The general evaluation criteria to be taken into consideration by the experts are the following:

Compliance with the aims of the programme and content of the present call

Scientific quality

- Clarity of the objectives and tasks; relevance of the methodology; coherence of the objectives, the tasks and the methodologies; alignment of the proposal with the state of the art in the proposed field;
- Scientific originality of the proposed research, taking into account the innovative character of the potential results, value of the research in light of other research underway in the field in question.

Potential impact of the project on science, society in general and on decision-making

- Positioning/relevance of the research with regard to the orientations of the call;
- Potential use or integration of the project results by the scientific community, society and decision-makers;
- Relevance of the proposals for distributing the results and making them available;
- Profile of the members, role and functioning of the follow-up committee;
- Integration of relevant societal themes such as sustainability, the gender aspect, etc.

Quality of the proposer(s)/network - if applicable

- Level of scientific excellence or expertise of the partner(s);
- Complementarity of the competences among the partners;
- Interdisciplinary nature of the network;
- Distribution of tasks between partners;
- Added value of the contribution of the African partners of Least advanced African countries;
- Scientific quality, management, synthesis and communication skills of the coordinator.

Compliance of project/resources

- Balance of the distribution of resources between partners - if applicable;
- Realism of the means deployed (duration, budget, personnel);
- Gathering, use and accessibility of the data necessary for the project;

International anchoring - if applicable

- Positioning of the project in relation to international activities (existing or in preparation)

4.3. CONTRACTUAL OBLIGATIONS

4.3.1. CONTRACTS

For the proposals selected, a contract is drawn up 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 experts and the Advisory Committees.

Adaptations to the original proposal may relate to the content of the research, the composition of the network or Follow-up Committee, the budget, the choice of the coordinator, the proposals for valorising the research, etc.

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.

4.3.2. REPORTS AND PROGRESS MEETINGS

The contract will define the various reports to be submitted to BELSPO. 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.
As well as the reports, meetings on the project's progress will be organised between the network and BELSPO.

4.3.3. DATA, RESULTS, INTELLECTUAL OWNERSHIP AND OPEN ACCESS

Foreground shall be the property of the institution carrying out the work generating this foreground, as mentioned in article 11 of the general conditions of the contract (annex 2). 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.

Furthermore, each institution undertakes to make the foreground available in a freely accessible institutional deposit (institutional open access repository), immediately and free of charge, in order to be able to read, download, copy, print, or distribute it or to carry out a search within it.

For research areas concerning the marine environment, biodiversity and the Antarctic, researchers must bear in mind that a copy of the analysis and measurement data and/or metadata will nevertheless be transferred to specific databases such as:

- IDOD/BMDC (http://www.mumm.ac.be/datacentre),
- AMD (Antarctic Master Directory) (http://gcmd.gsfc.nasa.gov/KeywordSearch/Home.do?Portal=amd&MetadataType=0),
- GBIF (Global Biodiversity Information Facility) (http://www.gbif.org/) with possibly the help of the biodiversity platform (http://www.biodiversity.be)

For social and Humanities data, those will be transferred to SOHDA.

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).

4.3.4. 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.

5. 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 43, 1000 Brussels. (email contact@mediateurfederal.be).

6. CONTACTS

Further information can be obtained by contacting the **secretariat**:

BRAIN-be@belspo.be

02/238 37 61 (FR)
02/238 35 72 (NL)

ANNEX 1: LIST OF FEDERAL SCIENTIFIC INSTITUTIONS (FSI)

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