

WHAT IS JOINT PROGRAMMING (JP)?

In Europe, as well as globally, we face a number of societal challenges that no country or region can tackle alone. Addressing these so-called Grand Societal Challenges efficiently and effectively will require combined efforts and new ways of collaboration between countries. In this context, the European Commission introduced Joint Programming to the European Parliament and the Council of European Union in 2008. It is one of the priorities for implementing the European Research Area (ERA). JP is an intergovernmental process enabling European Member States and associated and third countries to participate in those joint research programming activities that are strategically important and offer synergies. The objective is to better align the 85 per cent of research and innovation investments spent at national level. Member Countries participating in Joint Programming are expected to engage in concerted and joint planning, implementation and evaluation of national research and innovation programmes to define common priorities. This provides a basis for long-term cooperation, increasing the value of research, development, innovation and infrastructure investments at all levels; regional, national and European. Such an approach requires a top-down, high-level sustained strategic intergovernmental dialogue. Only this will ensure the shared political visions needed to respond to these grand challenges in the form of commonly agreed Strategic Research and Innovation Agendas (SRIAs) that can also take into account diverse stakeholder needs.

PLACE FOR FIG 1
PUBLIC FUNDING
FOR RESEARCH,
EC, 2010

Fig 1 public funding for research, EC, 2010

WHAT ARE JOINT PROGRAMMING INITIATIVES?

Joint Programming Initiatives (JPIs) were launched in the major research fields focused on tackling the Grand Societal Challenges via European Council conclusions in 2009. JPIs are Member State-led, bringing together national research funding organisations, ministries and research councils both in Europe and further afield. This ambition, of aligning national programmes, strategies and policies, extends beyond the matching of RD&I funds. The alignment process (Fig 2) covers various phases, from setting joint objectives and forging a common vision and a SRIA between countries to developing appropriate framework conditions and selecting appropriate instruments. Developing joint Strategic Research and Innovation Agendas is an aligning mechanism in itself due to the required national strategy decision processes involving national decision makers and policy actors and ensuring broad stakeholder involvement. JPIs are long-term processes that contribute to EU and global policy objectives including EU2020 smart, sustained inclusive growth, UN Sustainable Development Goals and WHO goals. As mission-oriented programmes, the JPIs address complex issues requiring an integrated, inter- and transdisciplinary approach. A portfolio of implementation measures and instruments, based on the developed strategies was, and continues to be, developed for supporting and strengthening joint transnational actions (Fig 2). With these activities, the JPIs intend to complement the European Commission’s activities under Horizon 2020 and other programmes by taking advantage of national programmes, competences, skills and infrastructures. In addition, the JPIs can develop into platforms that can engage in partnerships with the European Commission. This is based on the recognition that the Commission impacts strongly on transnational cooperation in areas that have had to achieve critical mass.

Fig 2: Alignment process based on the example of JPI Urban Europe



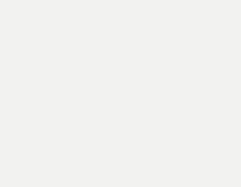
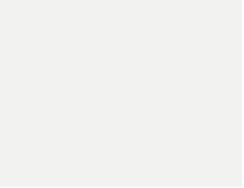








JPIS – THE WAY FORWARD

In recent years, the focus has been on developing and establishing the JPIs, their governance structures and portfolios. The coming years will be dedicated to scaling up the JPIs and strengthening and broadening their activities and instruments.

- JPIs are platforms to jointly face the complex societal challenges, open to all European Member States, Associated Countries and international partners. Therefore, they aim to widen participation in Europe and beyond, reinforcing long-term partnerships between governments and RDI communities to build critical mass and impact.
- JPIs have proven their value in addressing societal challenges through aligned transnational and intergovernmental efforts. However, the global dynamics and developments that influence these challenges demand a high responsiveness for developing future priorities, instruments and activities. Therefore, the JPIs will continue to adapt their strategies and priorities to match the coming research and innovation needs.
- As mission-oriented programmes, JPIs have developed their portfolios not simply for funding research and innovation but also for delivering impact, improving efficiency of these RDI investments and providing evidence that supports policy making. The JPIs will gradually continue improving and extending their implementation measures and instruments to fit the needs of the respective research and innovation areas.
- Flexibility in selecting, developing and adapting the instruments and activities to meet the needs of the research and innovation area allows countries and partners to participate in actions that match their national priorities and needs.
- Although each JPI is addressing a specific societal challenge, many of these are interlinked, calling for a coordinated approach. The first cross-JPI activities are already underway, with a commitment to further strengthening these joint efforts. The ten JPIs have regular exchanges and engage in mutual learning on areas of common interest, both thematically and operationally.
- For JPIs to become European hubs on a global scale for their respective societal challenges demands national commitment and transnational, European collaborative efforts. This requires policy, strategic and operational alignment not only among participating national partners but also within various policy fields at the national level as well as between JPIs and European Commission activities, eg, the European Research Framework.

JOINT PROGRAMMING INITIATIVES



 JPND www.jpnd.eu secretariat@jpnd.eu	 MYBL www.jp-demographic.eu	 OCEANS www.jpi-oceans.eu jpioceans@rcn.no	 CLIMATE www.jpi-climate.eu secretariat@jpi-climate. belspo.be	 URBAN EUROPE www.jpi-urbaneurope.eu info@jpi-urbaneurope.eu
 HDHL www. healthydietforhealthylife.eu jpihdhl@zonmw.nl	 AMR www.jpnamr.eu Secretariat@jpnamr@vr.se	 CULTURAL HERITAGE www.jpi-culturalheritage.eu jpi_ch@beniculturali.it	 WATER www.waterjpi.eu waterjpisecretariat@ agencerecherche.fr	 FACCE www.facejpi.com FACCE-Secretariat@inra.fr

WHAT ARE THE BENEFITS OF PARTICIPATING IN JPIS?

Jpis are building and maintaining communities – this needs a long-term approach.

New forms of long-term collaboration between local, regional, national and European policy makers and actors that reduce fragmentation and increase the impact of national RD&I investments:

- Building trust and encouraging collaboration between national research policy makers, ministries, funding agencies, research performing organisations and related stakeholders from differing countries;
- Building critical mass in the related RD&I fields based on national strategies, policies, competences and programmes;
- Benefitting from institutional alignment and partnering with international research organisations in strategic programmes, and
- Building upon national/regional/local RD&I competences, strategies and priorities, benefitting from direct access to local stakeholders, aligning and connecting them in transnational activities on a European level.

Fostering and testing innovative approaches and science-policy cooperation:

- Establishing European innovation ecosystems that foster stakeholder involvement and co-creating new solutions;
- Turning science into practice through new partnerships and dedicated programme management, including strategic community building, translating science into policies, driving new innovation models and disseminating and communicating research results to support their exploitation, and
- Leveraging and testing new tools and ways of cooperation, setting up new instruments and facilitating mutual learning.

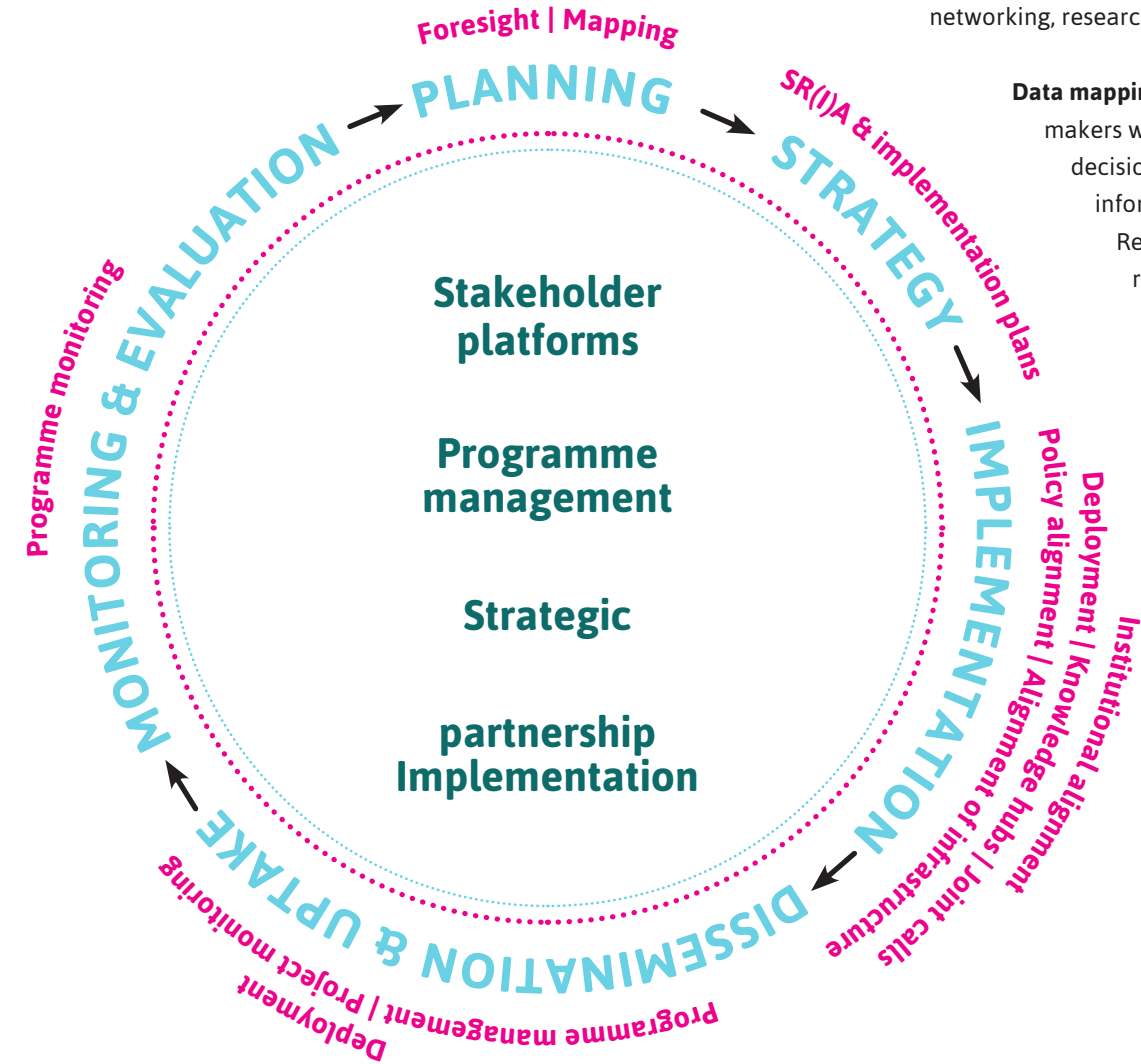
JPis as gateways for scientific excellence, relevance and international cooperation:

- Driving scientific excellence and competitiveness through joint calls and actions and participating in relevant European and international programmes;
- Showcasing European science on global societal priorities to the world and contributing to international agenda setting, and
- Raising visibility of European competences and achievements and representing the European RD&I community in international cooperation.

JPI IMPLEMENTATION ACTIONS FOR TRANSNATIONAL ALIGNMENT AND COOPERATION

All JPis have developed SRIAs that define common ground for cooperation and setting targets for joint actions. Alongside these agendas and related implementation plans, JPis are creating and maintaining an environment for mission-oriented research and innovation. Joint calls for transnational research and innovation projects provide a solid basis for generating new knowledge, fostering transnational exchange and validating new solutions. However, ensuring knowledge uptake by policy and exploitation of these results requires additional activities and instruments. In addition, there are efforts to develop shared infrastructures, data and knowledge hubs and strategic programme management. Accordingly, the JPis have developed a portfolio of instruments tailored to their specific topics and requirements over the last few years (Fig 3). Table 1 summarises the portfolios established by each of the JPis to date.

Fig 3: JPis’ portfolios of instruments along the innovation policy cycle



Foresight: Prospective exercises assist in creating joint visions and providing important frameworks for strategy development.

Strategic Research and Innovation Agenda: These are essential in defining the common agenda and joint actions. They summarise the main ambition of JPis, defining research and innovation priorities and guiding selection and development of implementation measures.

Joint Calls: Established by the JPis, these are guided by the priorities of the respective Research and Innovation Agendas. For each of the calls, funding agencies individually decide their involvement and the budgets they commit, depending on their national agendas and priorities, according to the variable geometry principle. In some cases, they establish cooperation with the European Framework Programme (H2020) through ERANET Cofunds.

Knowledge Hub: A “Knowledge Hub” is an innovative, tailor-made instrument, unites three complementary dimensions; networking, research and capacity building.

Data mapping: This provides scientists and policy-makers with relevant data for evidence-based decision-making. Data mapping also helps inform development of the JPI’s Strategic Research Agendas and any calls or research proposals that will follow from them. They identify relevant sources, helping individual projects avoid repeating work and ensuring that research proposals remain well informed about possible data sources.

Aligned or shared infrastructure: Aligned or shared infrastructure may comprise physical labs for developing and validating new technologies and solutions or databases or living lab eco-systems for demonstrating and exploiting new concepts and solutions.

Alignment of research performing organisations: National investments in research performing organisations (such as universities or applied research organisations) represent a high proportion of national RDI budgets. By setting up strategic, long-term partnerships between these organisations, the various research actors can generate knowledge, develop new solutions and drive innovation to connect.

Policy alignment: As mission-oriented RDI programmes, JPis aim to provide scientific evidence for policy makers. This involves translating research results into policy recommendations, exchanging national policies that address the given societal challenges and jointly developing policy measures.

Stakeholder involvement: Setting up a long-term research and innovation programme on societal challenges requires not only funding research and innovation projects but also strong stakeholder involvement. Appropriate models for involving stakeholders that recognise the complexity of the JPis’ priorities need to be established along the entire knowledge and innovation chain.

Programme management: Programme management covers a variety of actions for exploiting project results more effectively; strategic analysis of projects, generating added value for follow-up actions through results and data as well as supporting the RDI community in building new partnerships and cooperation. International outreach: JPis aim to establish themselves as European hubs on a global level in their respective research areas. Dedicated outreach activities allow the initiatives to connect with related RDI programmes in other regions of the world, become partners in joint calls and exchange information on strategic issues and long-term priorities. International partners appreciate JPis as outstanding instruments for non-European countries to collaborate with European Member States on strategic and executive level.



GOVERNANCE MODEL OF JPIS

Each JPI has developed its own governance structure according to the specific needs of the chosen challenge and research area. However, all share a common understanding of the main principles of the JPI governance model (Fig 4). Some have

developed governance principles for sustainability, stakeholder orientation and open access as overarching guidelines for their mode of operations and for implementing their Strategic Research Agendas.



Fig 4: generalised governance model of JPis

JOINT ACTIONS

	JPND	MYBL	OCEANS	CLIMATE	URBAN EUROPE	HDHL	AMR	CULTURAL HERITAGE	WATER	FACCE
SRA / SRIA	•	•	•	•	•	•	•		•	•
Joint Calls (no EC co-funding)	•	•	•	–	2	•	•		1	•
Joint calls with EC co-funding	•	–	•	•	3	•	•		2	•
Programme Management	•	•	•	–	•	•	•	•	–	•
Stakeholder Involvement	•	•	•	•	•	•	•	•	•	•
Knowledge Hub	•	–	•	•	–	•	•	•	(•)	•
Data mapping	•	•	•	•	–	–	•	•	•	–
Foresight	•	•	•	•	–	•	•	•	•	–
Alignment of RPOs	•	–	•	•	•	–	–	–	–	–
Shared research infrastructure	•	–	•	–	(•)	–	–	•	–	–
Policy alignment	•	•	•	–	•	•	•	•	•	•
International outreach	•	•	•	•	•	•	•	•	•	•

Table 1: Implementation measures of JPis



JPI URBAN EUROPE

It is increasingly common to refer to the current era as the urban age. This reflects the fact that urban locations act as regional innovation hubs, attracting, processing and channeling the societal, cultural and economic human influences. However, replacing the currently unsustainable urban development models with urban environments and systems with the lowest possible carbon footprint and inequality requires action. Clearly, it is easier to coordinate economies of scale, size, infrastructure, consumer behaviour, strategic planning and cross-sectoral policy instruments on a city scale¹. Getting our cities and urban areas right is the key to keeping the planet right^{2,3}.

JPI Urban Europe's SRIA responds to the pressing need for ambitious, sustained and genuinely inter- and transdisciplinary research and innovation that will radically improve our under-

standing of the social, economic and environment sustainability of urban areas. It will help Europe's cities transition to a future that maximises their sustainability, resilience and their liveability, vital in an era of global competition for commerce, industry, tourism, labour and investment.

JPI Urban Europe's strategy and actions contribute to the EU 2020 Strategy on smart, sustainable and inclusive growth, the EU Urban Agenda and the UN Sustainable Development Goals.

¹IPCC (2014) Fifth assessment report, <https://ipcc.ch/report/ar5/index.shtml>

²UN. (2014). Progress to date in the implementation of the outcomes of the second United Nations Conference on Human Settlements (Habitat II) and identification of new and emerging challenges on sustainable urban development. Report of the Secretary-General of the Conference, A/CONF.226/PC.1/5, 26 July 2014. United Nations General Assembly

³JPI Urban Europe. (2015). Strategic Research and Innovation Agenda: Transition Towards Sustainable and Liveable Urban Futures; <http://jpi-urbaneurope.eu/downloads/jpi-sria-def-pdf>.

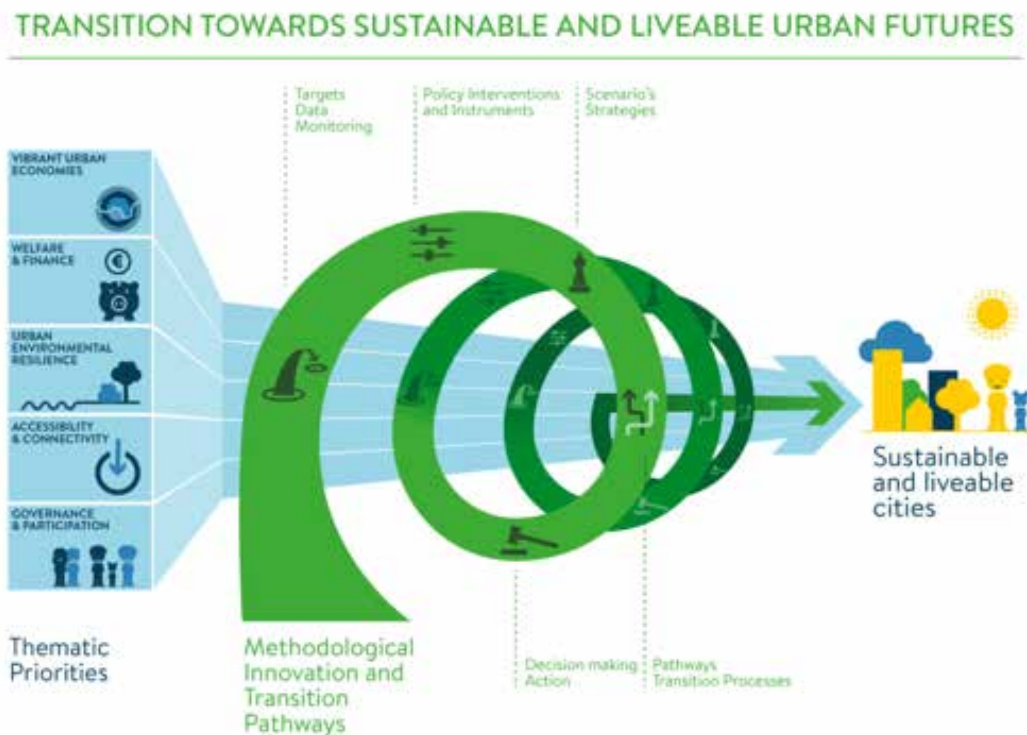
KEY ACHIEVEMENT:

Enhancing commitment and impact through stakeholder involvement and strategic programme management

Urban development and urban research and innovation are complex. Both need various actors and stakeholder groups to generate commitment for new solutions and to enhance the impact of research investments. If urban research and innovation is to be fully exploited and serve our societies and citizens, it has to take into account specific urban realities and connect to various urban actors. Setting-up a long-term research and innovation programme on urban transition requires both funding of research and innovation projects and an environment that can involve the four main urban stakeholder groups - cities, business, society and research – on local, national and European levels.

This co-creative process has already been used in developing the JPI UE Strategic Research and Innovation Agenda, allowing these stakeholders to inform the SRIA of their specific priorities and reflect the strategy against national and local requirements. The objective of this strong stakeholder involvement and community building during the programme is to assist implementing and exploiting the results from the research projects funded. It anticipates the end users'

needs in the programme design and thematic priority setting, matching them to scientific advancements. The JPI's joint calls framework conditions are adjusted to deliver strong stakeholder contribution within individual RDI projects. The JPI Urban Europe project portfolio, which currently stands at 37 projects (soon to rise to 50) generated by annual calls issued since 2012, is connected and organised through a strategic management programme. It also requires an institutionalised approach to stakeholder involvement. Therefore, a Stakeholder Involvement Platform provides a framework that supports different types and levels of involvement. This can range from simply staying informed about activities and tracking progress up to regularly engaging in the strategic debates and teaming up in joint efforts to support urban transition. In addition, the JPI Urban Europe conference, dedicated workshops and communication formats regularly connect science with policy and business, helping translate research into policy recommendations and assisting the societal and commercial exploitation of project outcomes. The JPI Urban Europe countries are investing in management capacity, organised by in-kind contributions to the management team, ensuring sustainable programme development and management.



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MAP NOT YET UP TO DATE

JPI ON CULTURAL HERITAGE (JPI CH)

In addition to natural ageing, Europe's Cultural Heritage faces a variety of threats including climate change and pollution, environmental risk, increasing urbanisation, mass tourism, negligence, vandalism and even terrorism. Protecting this Cultural Heritage in the face of global change is increasingly becoming a major concern for decision-makers, stakeholders and citizens. Safeguarding Cultural Heritage against continuous decay demands research into effective strategies, methodologies and tools and concerted actions based on sound science.

The JPI CH promotes safeguarding Cultural Heritage in its broader sense, including tangible, intangible and digital assets. The strong relationship between Cultural Heritage, technological innovation and economic development allows for further considerations within the European framework

of challenges and competitiveness. A joint multidisciplinary approach to Cultural Heritage sustainability, arising from research, has now been implemented. It exists within the Scientific Cultural Area, a multi-frame scenario that is part of the European Research Area and includes science, engineering, technology, art, literature, conservation and culture. Supporting research activities and researcher training means reaffirming Europe's cultural identity as a worldwide ambassador of Cultural Heritage excellence.

KEY ACHIEVEMENT:

Since its launch the JPI CH implemented joint programming on research applied to the cultural heritage multidisciplinary fields among European Member States and Associated Countries.

The two joint calls recent launched by the JPI CH enabled it to successfully achieve this crucial objective. Both the so-called 'Pilot Call' (2013) and 'Heritage Plus Call' (2014) drew attention to the complex nature of a Culture Heritage based on tangible, intangible and digital dimensions. The 26 transnational projects funded, involving researchers and SMEs from 17 European countries and one non-European country (Israel), ultimately presented excellent, innovative methods for addressing the current diverse issues. They cover understanding damage and decay mechanisms on tangible heritage; increasing understanding of cultural values, valuation, interpretation, ethics and identity; safeguarding tangible Cultural Heritage and its associated intangible expressions; providing sustainable strategies for protecting and managing Cultural Heritage; promote use and re-use of all kind of Cultural Heritage. Both calls required applicants to match their projects to one of the

mentioned topics and brought an outstanding response from the research world. The number of proposals submitted has increased substantially, from 89 in the Pilot Call to 352 in Heritage Plus call. Most were high quality and ambitious solutions in the field of Cultural Heritage.

The majority of the 26 projects funded are still ongoing. Monitoring their activities shows not only successful scientific results but also increasing attention to topics that are on top of the Strategic Research Agenda. The JPI CH is convinced of the importance of shedding light on crosscutting research, both basic and applied, for Cultural Heritage. It is in the process of organising a further joint call focusing on the same features (i.e. multi and inter disciplinary, manifold nature of Cultural Heritage, interconnection between various research and innovation realities). This will contribute to safeguarding and valuing Cultural Heritage in innovative and sustainable ways.

A relevant JPI CH achievement has been the launch of the Heritage Portal <http://www.heritageportal.eu/>, involving policy makers, researcher communities and stakeholders.



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WATER JPI

The Water JPI is dedicated to achieving sustainable water systems for a sustainable economy in Europe and further afield; an ambitious challenge. This will be delivered via a multi-disciplinary approach, including economic, ecological, societal as well as both technological and non-technological considerations.

The Water JPI provides an opportunity for broader cross-border cooperation, greater collaboration and a more unified focus on water RDI both in Europe and further afield:

- In 2015, the World Economic Forum⁴ identified water crises as the number one risk in terms of their impact to economy and society in the coming years. Global water requirements are projected to exceed sustainable water supplies by 40 per cent by 2030. Decision-makers will be forced to make tough choices on how to allocate water in ways that will impact users throughout the economy;
- The European water sector (annual turnover €72 billion) is highly fragmented with a diverse range of stakeholders; water resources, water supply and wastewater are often locally managed;
- The current development of water technology is insufficient to meet the grand challenge of delivering sustainability. Bringing Europe to the top of global competitiveness levels will require further technological advances. Often, the main running costs of technologies relate to energy consumption. This means that the water-energy nexus plays a crucial role in all economic sectors and in society at large; agricultural production presents another challenge for the water resources framework, and

- New approaches in water efficiency within economic sectors that can decrease the costs of energy consumption will be the next challenge for science in the coming years. In addition, there needs to be policies and programmes that create the appropriate conditions for relevant RDI breakthroughs and innovation. Non-technological innovation, mainly relating to governance, organisational and social innovation (eg,

consumption patterns) present additional challenges for the water sector.

The science-based knowledge produced by the Water JPI will support European and international water policies, including identifying and quantifying existing problems and developing feasible technical and managerial solutions.

KEY ACHIEVEMENTS:

Ten key achievements have been reached to date. The Water JPI membership has grown, currently with twenty partner countries and four observers, resulting in a partnership that accounts for 88 per cent of all European public RDI annual expenditure on water issues. One of the main key achievements of the Water JPI, since its approval by the European Member States in December 2011, is the high level of partner involvement in implementing joint transnational calls. The international cooperation dimension of these first actions include Israel, Norway, the Republic of Moldova and Turkey (full Water JPI members), as well as three additional Horizon 2020 associated countries (Egypt, South Africa, and Tunisia) and two international partners (Canada and Taiwan).

These first actions were implemented in close cooperation with key water stakeholders. There were consultations with the two Water JPI advisory boards (scientific and technological board, stakeholder advisory group), two public consultations on the Strategic Research and Innovation Agenda,

national mirror groups and the first Water JPI conference, with more than 200 participants. There were also three round-table discussions with speakers representing water public utilities, ministries, research centres, private foundations, EU and international water-related platforms and networks. These covered the water research priorities identified in the SRIA, their implementation and the benefits of international cooperation in jointly tackling the grand challenge of delivering sustainable water systems worldwide. These identified new ideas for future exploration for transforming the Water JPI SRIA with concrete and practical actions, structuring the necessary co-operation and accelerating the development of solutions.

**Global Risks 2015 report, 2015 <http://reports.weforum.org/global-risks-2015/part-1-global-risks-2015/introduction/>*

References:

*Water JPI Key Achievements 2011-2016 - May 2016
Water JPI Vision document - April 2011
Water JPI Strategic Research and Innovation Agenda - April 2016
Introduction to the Water JPI SRIA 2.0 - May 2016
Water RDI mapping report - December 2014*



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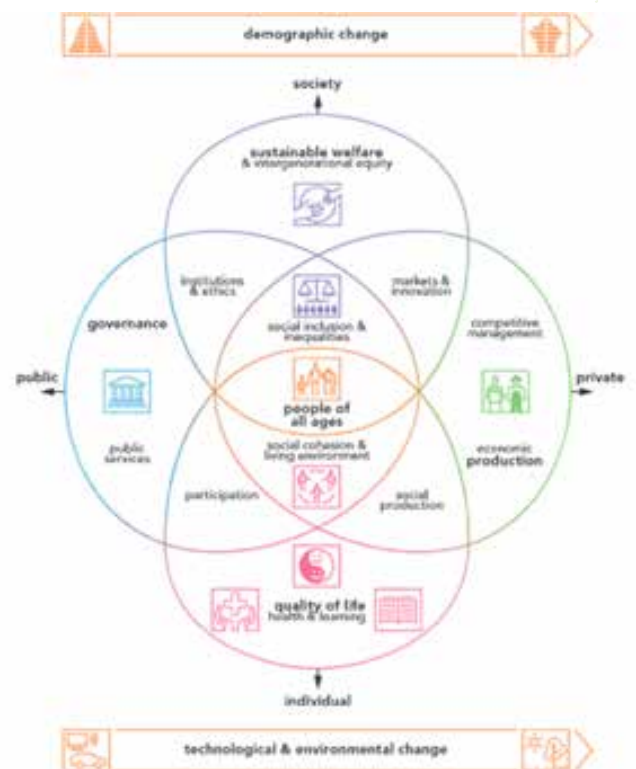
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Currently 15 European states, Canada and Israel are members the JPI.

JPI MYBL VISION

Demographic Change is another of the grand social and economic challenges facing Europe. The combined effect of increasing life expectancy and low fertility rates is creating an ageing population, a picture compounded by rapidly changing patterns of migration.

Because these are Europe-wide issues, they are particularly appropriate for joint efforts by European countries. However, since demographic change is a complex process, there are no simple explanations or solutions available. Despite this, joint research and development can provide evidence that helps policymakers and other stakeholders turn this threat into a positive opportunity for citizens of all generations. A comparative perspective can illuminate the diversity of strategies and policies.



This complexity means that many research fields and policy areas can offer relevant expertise. These range from health and social welfare, through education and learning, work and productivity to housing, environment and technology. Therefore, dealing with demographic change demands a strongly interdisciplinary approach, presenting its own methodological challenges.

This JPI builds its strategic research agenda around four broad research domains (see figure 1):

- Quality of life, health and wellbeing;
- Economic and social production;
- Governance and institutions, and
- Sustainable welfare.

Within these domains, the Agenda highlights ten topics for urgent attention. The Agenda can be found at: <http://www.jp-demographic.eu/about-us/strategic-research-agenda-sra/>

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KEY ACHIEVEMENT:

One key achievement of this JPI is the 'Fast Track' projects, where experts nominated by the participating states work together over a relatively short period, reviewing a topic and preparing for further research. <http://www.jp-demographic.eu/activities/exploration/fast-track-projects/>

The initial Fast Track project was Data Mapping. This set out to address the issue that, because demographic change has implications for so many academic fields, researchers are often unaware of relevant data sources in other disciplines.

Thirteen JPI Member States each nominated a national expert to a team carrying out critical reviews of relevant data sources at national, European and global levels. They examined 337 data sources on topics as diverse as public attitudes to age, health, welfare systems, technology use and civic engagement. The reviews examined the data topics, sampling methodologies,

coverage, gaps and limitations, ultimately producing recommendations on how to improve the quality of the data.

The outputs of this were a set of policy briefs outlining the state of data in nine of the countries, thirteen national reports providing a more detailed overview of national data and a searchable interactive website where researcher or policy-makers can find full details of all sources. These are useful tools for researchers and policymakers, forming part of the necessary preparations for future JPI research projects. The materials will be updated in 2018.

A second Fast Track project reviewed policies and practice on the employment of older people. The JPI has also commissioned a set of more substantial transnational research projects on "Extending Working Life and its interaction with Health and Wellbeing". Two further joint calls are in preparation.



Website: www.jp-demographic.eu

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JPI CONNECTING CLIMATE KNOWLEDGE FOR EUROPE (JPI CLIMATE)

JPI Climate is a European Joint Programming Initiative of EU Member States and Associated Countries that aims to provide climate knowledge for post-COP21 Climate Action. It works in cooperation with, and complementary to, the European Commission. Its vision is to inform and enable the transition to a low-emission, climate-resilient economy, society and environment aligned with Europe's long-term climate policy objectives. Therefore, JPI Climate is developing and coordinating a pan-European research programming platform. This will provide valuable climate knowledge and services for national, European and international climate strategies and contribute to international processes, including the UNFCCC and the UN Sustainable Development Goals.



KEY ACHIEVEMENTS:

Up to now, JPI Climate had:

- Support community-led Fast Track Activities for common vision, guidelines and methodological frameworks, ranging from climate observations and modelling to climate services, decisions making tools and sustainable developments;
- Develop mapping and knowledge hub of European contributors to Climate Services;
- Establish the JPI Climate Transdisciplinary Advisory Board to engage key experts and stakeholders in the field of Climate Action;
- Promote engagement, commitment and partnerships with the European Commission and others European initiatives,
- as well as with non-EU countries and others international initiatives.
- Launch four calls for proposals since 2013 to support disciplines from climate science to social sciences, as well as on inter-disciplinary and trans-disciplinary research involving stakeholders, for an amount nearly €100 million (incl. ERANET with cash and in-kind contributions, see box);
- Developed a revised Strategic Research and Innovation Agenda (SRIA) for the next ten years;
- Establish Action Groups to co-design and co-implement SRIA priorities with involvement of research performers, funders and stakeholders;

The ERA-NET “European Research Area for Climate Services” - ERA4CS - (www.era4cs.eu) is a JPI Climate’s flagship project. It represents a significant contribution to implementing the European Research and Innovation Roadmap for Climate Services, while insuring complementarity and synergy with other main European initiatives in this field (see attached figure). ERA4CS involves a large network of 15 public Research Funding Organisations (RFOs) and 30 Research Performing Organisations (RPOs) from 18 European countries. In March 2016, the ERA4CS partners launched a large joint call, contributing either cash or in-kind resources and co-funded by the European Commission. A total budget of €72 million is available to support three-year research projects involving at least three countries.

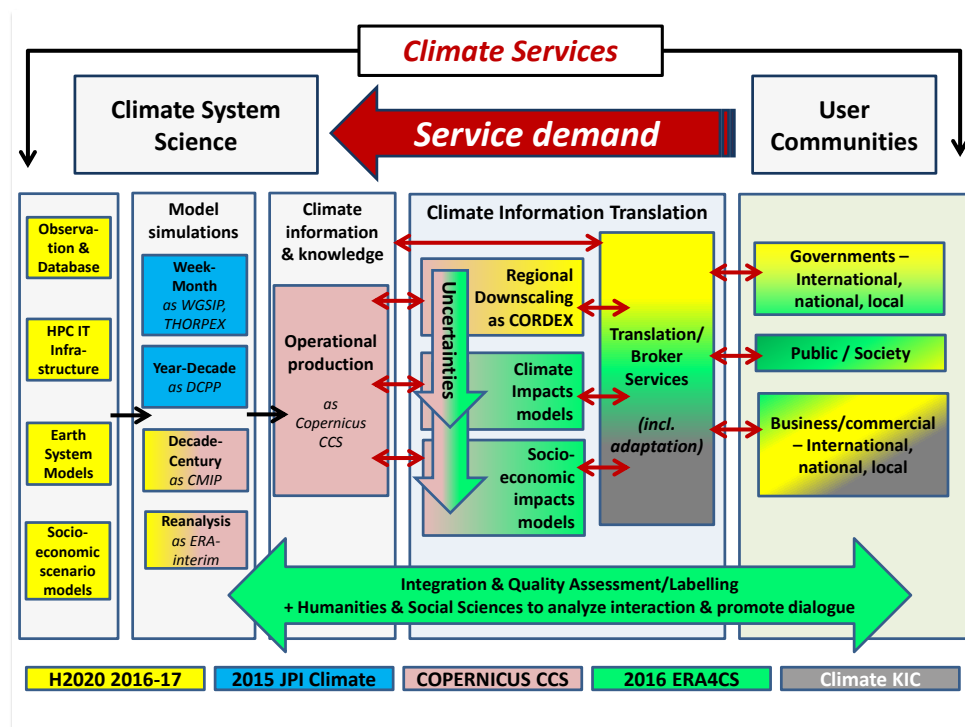


Figure 1: Simplified Climate Service Landscape in Europe for the period 2015-2017. The main focus of the JPI Climate’s 2016 ERA4CS call is displayed in green, and is related to complementary roles of other main European initiatives (H2020 WP 2016-2017 SCS Actions, the 2015 JPI Climate call on Climate predictability and interregional linkages, Copernicus Climate Change Service, EIT/Climate-KIC).

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FACCEJPI

MAP NOT YET UP TO DATE

FACCE-JPI

FACCE-JPI provides and steers research to support sustainable agricultural production and economic growth, to contribute to a European bio-based economy, while maintaining and restoring biodiversity and ecosystem services under current and future climate change.

This is achieved through a strong transdisciplinary research base, encompassing economic and social aspects in addition

to scientific ones, and accompanied with a creative approach towards the alignment of national programmes and the input of multiple actors and stakeholders.

Bringing together 22 Member Countries FACCE-JPI has been running since 2010. An updated Strategic Research Agenda was published in January 2016 and the actions of the second Implementation Plan are being carried out.

KEY ACHIEVEMENTS:

In its first six years, FACCE-JPI has achieved a great deal in terms of research alignment, having launched 10 joint research actions, mobilising approximately €110M of funding for transnational research activities, 80% of which comes from

national research budgets. FACCE-JPI has also organised a thorough mapping exercise and a number of exploratory workshops amongst its members. The joint actions launched by FACCE-JPI have relied on different approaches (e.g.,

networking amongst researchers, linking up existing research projects, new calls for research, etc.). Furthermore, FACCE-JPI has developed innovative instruments (e.g. knowledge hub) that have been duplicated by other JPIs, and 6 out of its 10 joint actions have involved non-EU countries.

To date, the FACCE-JPI actions include:

- 1 Knowledge Hub, MACSUR (FACCE's pilot action, see below),
- 3 joint calls with EC co-funding, through ERA-Nets (FACCE ERA-Net Plus 'Climate Smart Agriculture', FACCE-SURPLUS, FACCE ERA-GAS)
- 4 joint calls with other European initiatives, international partners and non-EU countries (Joint call with the ERA-Net BiodivERsA, Joint call with the Water JPI entitled Waterworks 2015, International call with the Belmont Forum, and a Mul-

ti-partner call on agricultural greenhouse gas research with 3 non-EU countries),

- 1 Thematic Annual Programming Network on soil organic matter, and
- 1 Knowledge Network on Sustainable Intensification.

In terms of scientific excellence and impact, the research in FACCE-JPI has helped inform European and international policy decisions, e.g., contributing to the EU Food2030 Strategy and IPCC's fifth assessment report (see below). In addition, FACCE-JPI has also helped identify new approaches for sustainable agricultural development (e.g. through research conducted as part of the ERA-Net Plus on Climate Smart Agriculture) and to increase the visibility of European research on agriculture, food security and climate change on a global scale.

FACCE MACSUR KNOWLEDGE HUB

The MACSUR Knowledge Hub was established in June 2012 as a three-year pilot joint activity of the FACCE-JPI (MACSUR1, 2012-2015). It is a network that builds on the concept of "Networks of Excellence" and that gathers European researchers who already have secured (national) funding for modelling and assessing how climate variability and change will potentially affect regional farming systems and food production in Europe and the associated risks and opportunities for European food security. The MACSUR Knowledge Hub brings together 300 researchers originating from 18 countries⁶ under the coordination of a German research institute, Thünen Institute of Market Analysis.

MACSUR has helped **reduce research fragmentation and duplication**, and achieve greater cost-efficiency. In addition, the Hub has led to (i) enhanced European **research excellence** thanks to the generation of new interdisciplinary knowledge on the impacts of climate variability on regional farming systems and food production in Europe; (ii) increased European modelling capacity thanks to joint training and capacity building activities for participating researchers; and (iii) a **better visibility and influence** on European and international policymaking, including at the level of the Intergovernmental Panel on Climate Change.

The main outputs listed in MACSUR's Summary of Results⁷ have also contributed to improvement of **trans-national data management** with the development of a common data classification and rating tool for exploration of existing data sets, the publishing of data sets generated by MACSUR⁸ and the harmonisation of databases. So far, MACSUR has supported:

- The publication of joint scientific papers (278 articles in peer-reviewed journals) and contributions to books and reports (including the report of the IPCC); the organisation of 8 major international congresses and presentations in over 450 scientific conferences;
- The development of applied regional case studies (currently in Finland, Austria and Italy) that allow to assist policy makers and actors in the agri-food chain in identifying effective and efficient adaptation and mitigation measures and potential consequence scenarios;
- The development of common "European Representative Agricultural Pathways" as an input to global scenario exercises (linked to the socio-economic and greenhouse gas concentration IPCC scenarios)

For more information on MACSUR, see www.eralearn.eu.

⁶Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Israel, Italy, Norway, Poland, Romania, Spain, Sweden, Netherlands, United Kingdom (list of participating research organisations: <http://macsur.eu/index.php/about/partners>).

⁷Summary of Results of MACSUR1 (2015); MACSUR First Phase Report (2015)

⁸<http://macsur.eu/index.php/toolbelt-preview>

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PLACE FOR THE LOGO



MAP NOT YET UP TO DATE

JPND

Neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease are debilitating, expensive and largely untreatable conditions strongly linked with age. Dementia alone affects almost 47 million people globally, a number expected to almost double every 20 years.⁹ By 2050, some 132 million people will be living with dementia.¹⁰ This creates a heavy burden on the individuals with the disease as well as their relatives and society as a whole.

Neurodegenerative diseases represent one of the world's most pressing medical and societal challenges. The solutions are likely beyond the scope and resources of any single country; we can only confront this common challenge by maximising our collective potential at European and global levels.

As the initial pilot of the Member State-led Joint Programming Initiatives, JPND enables participating countries to collaborate on tackling the challenge of age-related neurodegenerative diseases on a voluntary basis. They can participate on an "à la carte" basis, according to their national priorities and areas of excellence. JPND aims to use this Joint Programming approach of efficient and goal-oriented research collaboration to optimise national research strategies and funding schemes and more rapidly find causes, develop cures and identify better ways of caring for people with neurodegenerative diseases.

⁹Alzheimer's Disease International (ADI). World Alzheimer Report 2015, August 2015.

¹⁰*Ibid.*

KEY ACHIEVEMENT: CREATING A GLOBAL RESEARCH AREA FOR NEURODEGENERATIVE DISEASE

Since its establishment in 2009, JPND has been increasing the effectiveness and impact of neurodegenerative disease research around the world. It is facilitating coordination of current and future approaches, aligning national research programmes and collaborating where appropriate by sharing tools and techniques more efficiently among participating countries.

Originally a European initiative, JPND is now global, with 30 countries participating. These include twenty-three EU Member States, four Associated Countries (Albania, Israel, Norway and Turkey) and three 'Third Countries' (Australia, Canada and Switzerland). Collectively, these thirty countries have made progress toward scientific, managerial and financial integration, allowing JPND to:

- Adopt a common Strategic Research and Innovation Agenda for 30 countries - the JPND Research Strategy - coupled to multiphase, pluri-annual implementation;
- Launch eight calls for proposals since 2011, supporting more than seventy innovative projects in basic, translational and social care research and mobilising nearly €100 million from national budgets to coordinated, trans-national neurodegenerative disease research;
- Support community-led Working Groups on urgent topics to establish 'best practice' guidelines and methodological frameworks to overcome barriers to progress;
- Develop an in-depth, objective analysis of current research activities and resources relevant to neurodegenerative disease through the JPND Research Mapping exercise, which will be updated and expanded to more countries in 2017;
- Build the JPND Cohort Portal, an interactive directory of neurodegenerative disease-relevant cohort studies, available on the JPND website from 2017;
- Establish the JPND Stakeholder Advisory Board to promote Patient and Public Involvement (PPI) in research, providing rapid, frank feedback and early advice from the broad PPI stakeholder community on JPND activities, including calls for proposals;
- Establish action groups to formalise research priorities around palliative care, experimental models, assisted living technologies and longitudinal cohorts, and
- Promote engagement, commitment and partnerships with the European Commission and non-EU countries, industry, other international initiatives, user groups and the public.



Visit the JPND website:
<http://www.jpnd.eu>

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A world map with a light grey background. The continent of Europe is highlighted in a darker shade of blue and green, indicating the primary focus of the initiative.

MAP NOT YET UP TO DATE

JPI HDHL

JPI HDHL focuses on research in the area of food, nutrition, health and physical activity to help prevent or minimise diet-related chronic diseases. JPI HDHL operates within the Food System, a broad and complex domain. The Food System can be defined as, “an interconnected web of activities, resources and people that extends across all domains involved in providing human nourishment and sustaining health, including production, processing, packaging, distribution, marketing, consumption and disposal of food” (Grubinger et al., 2010). This includes the entire value chain from primary production (agriculture, aquaculture and fisheries) to consumer intake – and back. This places JPI HDHL at the interfaces of Societal Challenges 1 and 2 of H2020 and thematic policies and regulatory frameworks on health and food production. Next to public programming and

investment in research and innovation, the food industry is also a major player in this domain. The food industry is principally interested in efficient production and in meeting consumer interest and demand.

JPI HDHL’s vision is that: “In 2030, all citizens will have the motivation, ability and opportunity to consume a healthy diet from a variety of foods, have healthy levels of physical activity and the incidence of diet-related diseases will have decreased significantly”. JPI HDHL has two specific aims; firstly, to increase understanding of those factors determining food choices and physical activity behaviour; secondly to translate this knowledge into programmes, products, tools and services promoting healthy food choices.

ACHIEVEMENTS AND HIGHLIGHTS

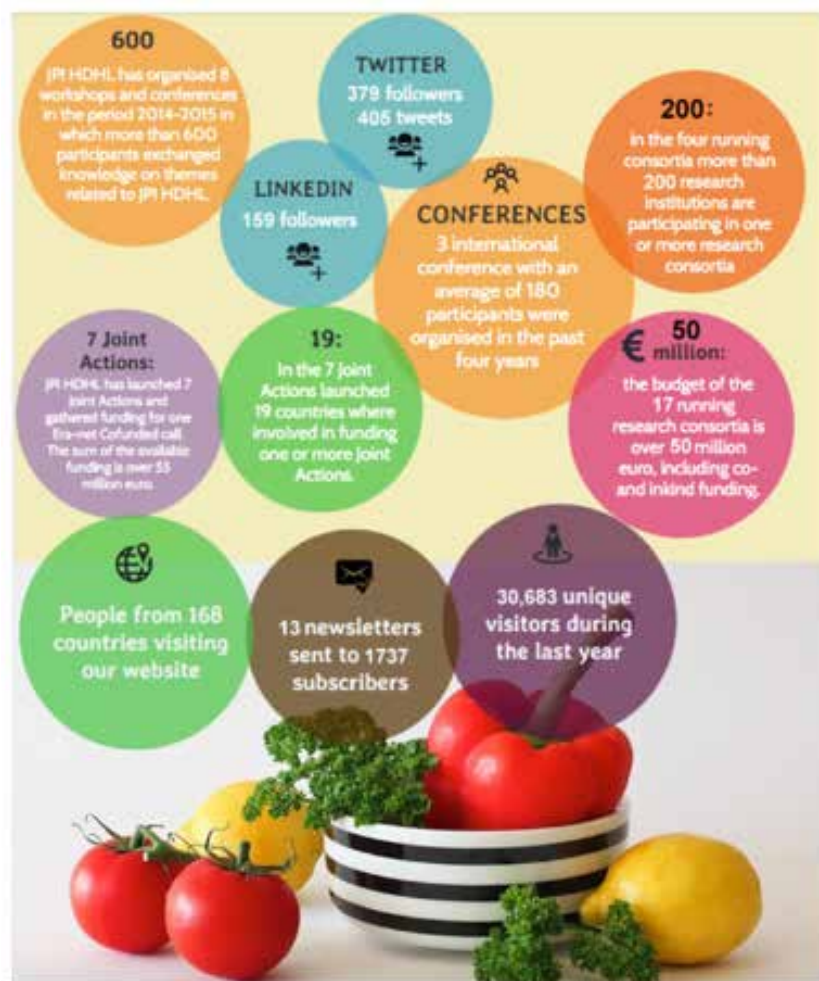
The JPI HDHL has significantly advanced co-ordinating research investments in a number of key areas. Knowledge sharing and capacity building are of crucial importance to address the societal challenge. JPI HDHL strives to ensure that the data generated through research under its umbrella (including, aspirationally, research funded in the ERA of Nutrition and Health within JPI's member countries) remains easy to locate, accessible, interoperable and reusable.

JPI HDHL is particularly proud of the European Nutritional Phenotype Assessment Data Sharing Initiative (ENPADASI) Joint Action; it shows an innovative approach to research investment. It takes into account both the scientific topic and how it should be addressed in order to properly contribute to the societal challenge.

ENPADASI is developing an open access research infrastructure (RI) for all nutritional, mechanistic, interventional and

epidemiological studies. For this, standardisation is vital, as combining studies relies on mapping those of similar data and design. This standardisation will consider study metadata and phenotypic data (eg, clinical data, dietary intake, lifestyle and physical activity, metabolomics, and transcriptomics). For this purpose, existing data infrastructures will be connected and further developed. This will create the most advanced system for integrating nutritional data in Europe and beyond, sharing large and small datasets. ENPADASI will deliver its final results in mid-2017.

To build on these achievements, JPI HDHL will develop a follow-up strategy that connects existing infrastructures and policy developments. The infrastructure and tools developed by ENPADASI provide an important starting point for the exploration process; along with some established Research Infrastructures (i.e. ELIXIR and BBMRI) and developments from the European Commission's policy on data sharing.



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MAP NOT YET UP TO DATE

JPI AMR

Antibiotics have saved millions of lives. However, antimicrobial resistance (AMR) continues to spread, as over-use and misuse is rendering many antibiotics ineffective. By 2050, 10 million people each year are predicted to die as a result of drug resistant infections. Currently, there few new antibiotics in development. Therefore, we must focus on **reducing the incidence** of bacterial infectious disease, ensuring **rational use** of the remaining antibiotics and **reducing transmission** of resistant bacteria. We must also **undertake further research** to better understand how resistance develops and spreads in the environment. We also need to develop diagnostic tools and better surveillance methods as well as validating smarter strategies for using antibiotics in healthcare and agriculture.

The Joint Programming Initiative on Antimicrobial Resistance, JPIAMR, coordinates national funding and supports collabo-

orative action for filling knowledge gaps on AMR. By mobilising existing and new resources, this initiative develops a critical mass and attracts new researchers to the AMR field. Our Strategic Research Agenda outlines the key areas to address and provides guidance documents for countries to align their AMR research agendas nationally and internationally.

As resistant bacteria do not observe national borders, JPIAMR works on an international level. By engaging nations beyond Europe as members, the JPIAMR platform enables collaborative actions in areas of unmet needs.

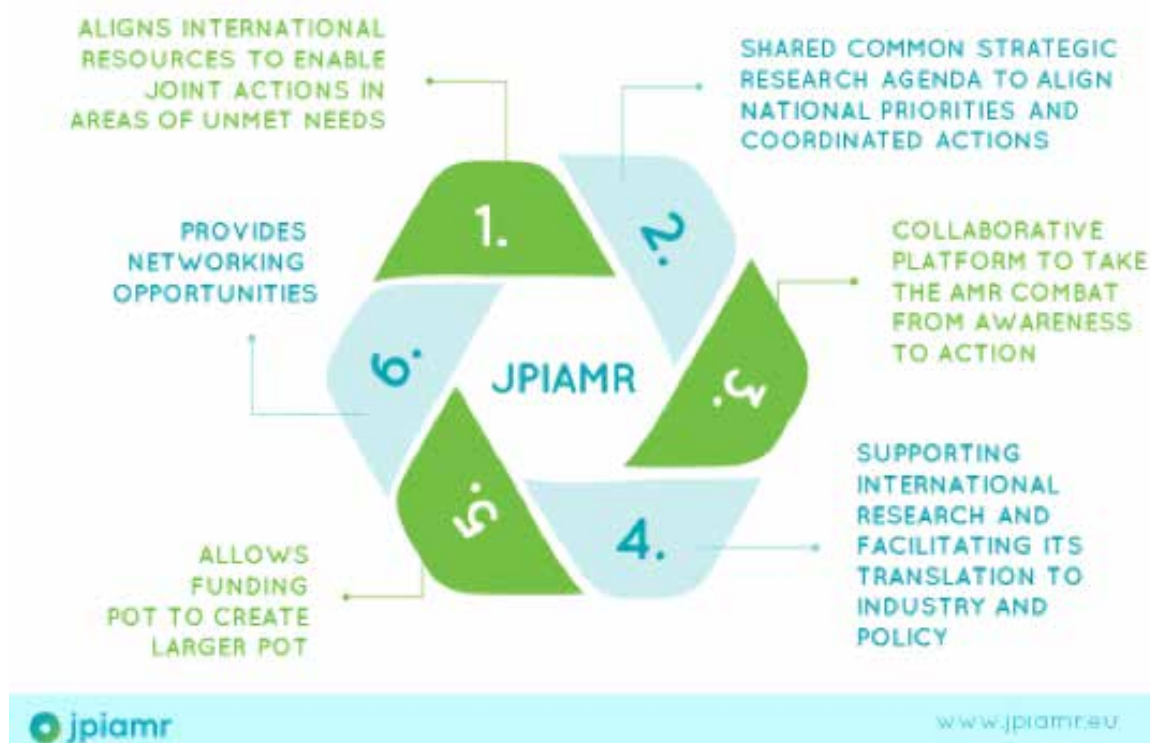
JPIAMR's main ambition is **to reduce AMR by supporting scientific activities** at international level. This will offer **evidence-based** solutions at policy, public health and veterinarian/ agricultural levels.

KEY ACHIEVEMENTS: ALIGNING RESOURCES BY DEVELOPING A COLLABORATIVE PLATFORM AND MAXIMISING EXISTING AND FUTURE EFFORTS TO COMBAT AMR.

Highlights include:

- **Adopting a 'One Health' approach** with a Strategic Research Agenda and an Implementation Plan. This approach is also the basis for development of the WHO Global AMR Research Agenda;
- **Mapping AMR research** and associated investment in participating countries was performed and published as an article in 'The Lancet'. Member countries enjoyed a strong structural effect from having a national overview of their AMR research capacity, with results available online on an AMR projects database. JPIAMR also conducts several high-level policy events, three international conferences and twelve strategic workshops;
- Developing **AMR national alignments** (via one health national expert panels and intergovernmental mirror groups) and **AMR plans and strategies** (from two countries with plans to twenty-two countries today) and adopting national plans to match the joint Strategic Research Agenda;
- **Funding research that both makes an impact and adds value.** The commitment of up to €55 million of funding for four joint transnational calls during the period of 2014–2016 was secured with four joint calls. These included a Research Network programme and one Eranet co-fund. Three further joint calls, including a fellowship programme, are in the pipeline;
- **Coordinating research priorities and calls with the EC, IMI and the pharmaceutical industry**, through a dedicated working group, regular meetings and joint workshops, and
- JPIAMR is an **international platform**, extending its membership beyond Europe. Japan, Argentina and Canada have joined. It is engaging with international stakeholders including WHO, the US National Institute of Health (NIH) and Transatlantic Taskforce on Antimicrobial Resistance (TAFTAR) organisations, the Association of Southeast Asian Nations (ASEAN) and the G7. JPIAMR activities are included in the G7 and G20 AMR declarations, in the WHO AMR Global Action Plan and in the latest UN AMR resolution.

JPIAMR'S ADDED VALUE



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JPI OCEANS



MAP NOT YET UP TO DATE

SHIP PICTURE
WON'T FIT

JPI OCEANS

JPI Oceans currently brings together 21 European countries, with representatives from ministries and research funding agencies.

Vision: Enabling Blue Growth and jobs whilst fostering the health and productivity of seas and oceans and addressing the pressures posed by climate change and human impacts.

KEY ACHIEVEMENTS:

The JPI Oceans member countries adopted a common Strategic Research and Innovation Agenda in 2015. This followed extensive consultation and a mapping and analysis of the marine and maritime research and innovation landscape. It prioritised ten strategic areas.

Mission: Providing a strategic policy platform for a long-term European approach to marine and maritime research and technology development. JPI Oceans adds to the value and impact of national research and innovation investments by implementing joint actions and aligning national priorities. These outcomes will help develop effective policies with robust and independent scientific evidence, helping underpin the ocean-based economy.

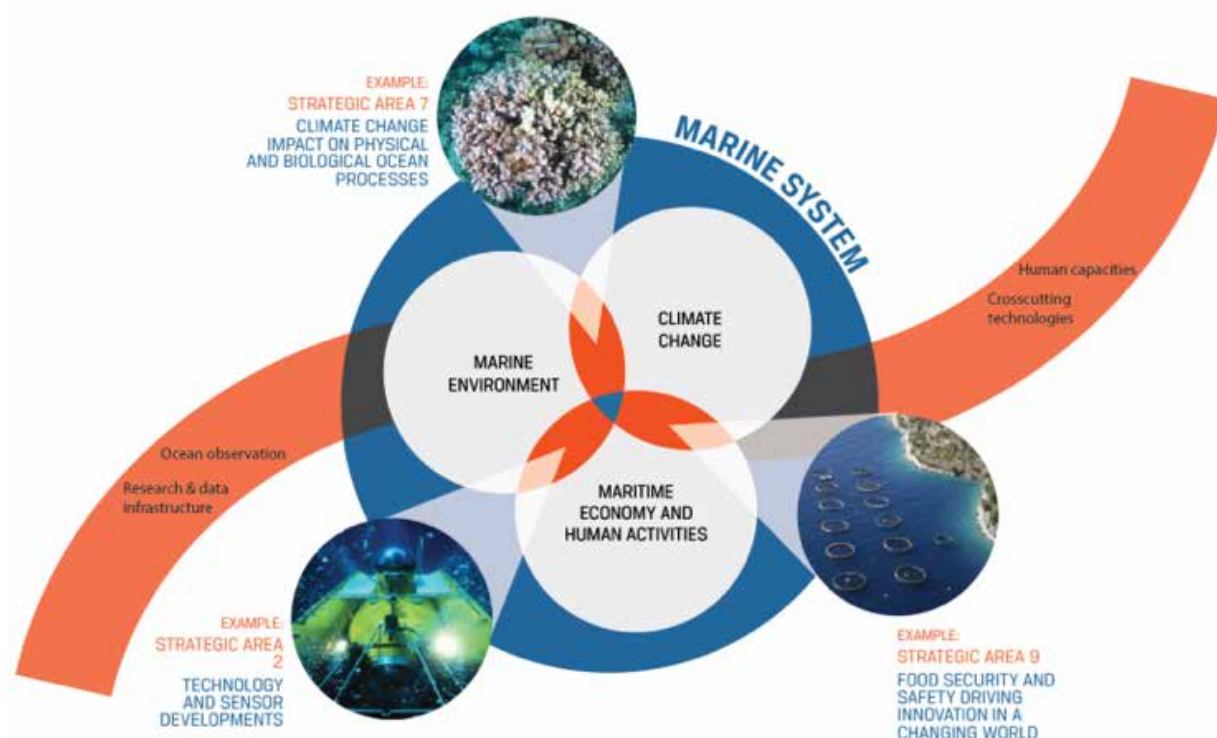
JPI Oceans has launched a number of actions, above and beyond the traditional approach of joint calls, for testing new collaborative tools that are relevant and fit for purpose. In each, one country takes the lead, driving the process in partnership with the other participating countries:

- Multi-use of infrastructure for monitoring in the North Sea; testing scope of integrating monitoring surveys for improved cost efficiency (lead NL);
- Intercalibration for the EU Water Framework Directive; proving comparability of assessment methods in different countries, by pooling funding from environmental authorities to engage experts, increase experience with joint data collection and analyses and providing cost-efficient scientific support to policy (lead BE);
- Ecological aspects of deep-sea mining; international research investigation using shared ship time and gathering knowledge to inform future international ocean governance (lead DE);
- Ecological aspects of microplastics; mobilising a researcher community and funding new research to address this emerging issue (lead DE);
- Munitions in the sea; providing scientific support to agencies addressing these risks, assessing available and new detection technologies and exchanging knowledge and practices (lead IT), and

- European Marine Sensor Calibration; forming a network for pursuing metrologically sound ocean measurements and instruments capable of continuous operation within known parameters during prolonged deployment in harsh conditions (lead Gr).

During implementation, participating member countries shared marine research infrastructure, procured bibliometric studies and pooled resources. These actions further increased the visibility of the topics at policy level within member countries, EU institutions and regional conventions. The impact of the actions is now also visible at a global level, with the action on the environmental impacts of deep-sea mining providing input to the International Seabed Authority.

JPI Oceans is working alongside former FP7 MARTEC ERANET partners, developing a new ERANET Cofund in Maritime and Maritime Technologies worth approximately €30 million. The first call for proposals is expected in December 2016, with new partners from outside Europe. For formulating future actions, the Management Board is building on the JPI Oceans' extensive knowledge base. This was developed in the early phase of initiative and covers strategies, projects, research infrastructures and collaboration toolkits.



JPI Oceans focuses on : the interactions between marine environment, climate change, and maritime economy and human activities and research in this area being enabled by ocean observation, data and infrastructure, cross cutting technologies and human capacities.

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**PILOT ACTION
WON'T FIT**