



Science Europe Position Statement

On the Role and Future of Joint Programming
AUGUST 2015



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Background

The concept of joint programming was introduced in 2008 to support the implementation of the European Research Area (ERA). The rationale for joint programming is described by the European Commission (EC) as follows:

“ Research efforts can be essential to address[ing] major societal challenges. In some cases these are so great that national research programmes cannot tackle them effectively on their own. Yet, the vast bulk of research programmes in Europe are run in an isolated way, leading to unwanted fragmentation or ineffectiveness. Joint programming aims to remedy this situation.¹ ”

Joint programming is described as a process whereby Member States agree, on a voluntary basis and in a partnership approach, on common strategic research agendas, to be implemented jointly on a variable geometry basis.

In 2010, the first Joint Programming Initiatives (JPIs) were launched to pilot the implementation of the joint programming approach. Currently, ten JPIs are operational:

- Neurodegenerative Disease Research (JPND)²
- Agriculture, Food Security and Climate Change (FACCE)³
- A Healthy Diet for a Healthy Life⁴
- Cultural Heritage and Global Change: A Challenge for Europe⁵
- Urban Europe⁶
- Connecting Climate Knowledge for Europe (CliK'EU)⁷
- More Years, Better Lives – The Potential and Challenges of Demographic Change⁸
- Antimicrobial Resistance (AMR)⁹
- Water Challenges for a Changing World¹⁰
- Healthy and Productive Seas and Oceans (OCEANS)¹¹

The Role of Joint Programming Initiatives

Collectively the Members of Science Europe cover all JPIs and have extensive experience with their management and use at the national level. To exploit the potential of JPIs, Science Europe Members interact with ministries, with the scientific communities, with European and international partners and with the EC.

The reported experience of those Member Organisations involved in JPIs indicates that to them JPIs are extremely valuable tools, especially to build and structure the ERA on the ground.

After several years of experience, JPIs are now maturing and need to be consolidated in order to fully deliver on their potential. As a result, it is important for all JPI stakeholders to reflect on their own roles with regards to JPIs, as well as on the wider role of JPIs within ERA. A shared understanding of the role and impact of JPIs will lead to correct assessment criteria and fruitful future policy directions.

This Position Statement will therefore highlight the added value of JPIs as perceived by the Science Europe Member Organisations, and contrast such added value with the current policy narrative used to depict the impact of JPIs. Based on these two contrasting views, the Position Statement will make two recommendations on the future of joint programming: one with regards to the evaluation of JPIs, and a second one concerning their governance. The aim of this Statement is to stimulate other stakeholders – including the EU Member States and the EC – to join in this discussion.

Science Europe's Experience with the Impact of Joint Programming

As recalled above, the main goal of joint programming is to create or enhance the critical mass available in Europe to address major societal challenges. In Science Europe's experience, this objective is broadly achieved, thanks to the following factors:

- JPIs enable the **linking up of the whole research and innovation eco-system** around their topic. This means that both blue-sky and use-oriented research are connected, and that collaboration with policy stakeholders at different levels can occur.
- The process of devising Strategic Research Agendas requires prior mapping exercises that enable the **identification of areas where an actual added value for alignment exists**, taking into consideration both the subject matter and the existing cross-border initiatives. Within the broad areas covered by each JPI, the added value of alignment or the existence of collaboration gaps can vary greatly. JPIs can therefore be considered as an excellent methodology to survey the scientific terrain in light of a societal challenge, and to charter realistic and fruitful routes.
- JPIs act, in several cases, as **focal points** – both nationally and internationally – for policy, initiatives or stakeholders that otherwise may not have a 'counterpart' on the topic, allow topical communities to speak with one voice, and more generally raise the profile of their area. In the case of the JPI FACCE for instance, the results of the JPI are being picked up by international organisations dealing with climate issues at the global level. Ultimately, JPIs enable an international community of researchers, managers and policy makers to act strategically in relation to the societal challenge at hand.
- At research level, in some cases JPIs foster the **alignment of data definition, collection, handling and storage, facilitating their sharing**. This kind of pooling of effort represents a very concrete step forward to push the knowledge frontier.
- JPIs can facilitate the **sharing of research facilities and resources**, by making formal arrangements or by alerting researchers to relevant existing resources in other countries.
- JPIs seem to partially **influence the European policy agenda**, by organising and structuring ERA-NETs in their field, when they exist, or by having an impact on the Horizon 2020 research agenda.
- JPIs feature an international dimension, which develops the **global networks** of the top European teams involved.

Beyond their scientific, strategic and practical impact, JPIs have specific features that make them complementary with national and European tools. They are fully flexible frameworks, whose management and funding models are national and therefore adaptable to local contexts and needs. This makes them particularly attractive as a way to complement the co-ordination and networking provided by Horizon 2020, and turns them, in many countries, into a way to add an additional strategic and international dimension to the existing national research support. Moreover, unlike other European initiatives, JPIs combine strategic and operational alignment.

A more obvious impact that is often associated by policy-makers to JPIs is the structuring of national research agendas.

However, the experience of Science Europe's Members suggests that this impact should not be considered to be universally applicable across JPIs and countries, and that it is difficult to actually pin such outcomes down to JPIs in a way that would justify the efforts required to run them. The structuring of national research agendas is context-specific. In some countries JPIs actually play this role; other countries use JPIs to influence others' research agendas, while others use JPIs as an additional dimension for existing initiatives.

It is not necessarily the case that countries where JPIs do not have a fundamental role in shaping national agendas find JPIs less useful or impactful. This is because JPIs pay dividends regardless of whether or not they structure national research agendas.

The Current Narrative of the Role of JPIs: Building Critical Mass by Decreasing 'Fragmentation'

The experiences of Science Europe's Members with JPIs, in terms of their role and added value outlined above, need to be contrasted with the narrative currently used to present this tool.

Policy documents on JPIs, such as the one quoted at the beginning of this statement, make a heavy assumption: efforts that are not co-ordinated via joint programming or similar trans-national public R&D programmes are fragmented, less efficient, and lacking in scale. As recalled above, the EC maintains that "the vast bulk of research programmes in Europe are run in an isolated way, leading to unwanted fragmentation or ineffectiveness".¹² As a consequence, current policy documents argue that scaling up joint programming would lead to more efficiency, thanks to better scale and less fragmentation.

These assumptions should be analysed carefully, and future policy options should be based on sound supporting evidence.

Evidence of 'Fragmentation'

The evidence put forward by the EC to support the fragmentation argument is largely based on input measures. The EC looks at national public R&D investments and tries to assign such funding to two distinct categories: 'co-ordinated' and 'un-coordinated'. Usually, the EC finds low figures associated to the category 'co-ordinated', such as 3.79%¹³ or 1.42%.¹⁴ These figures are most commonly used to suggest that Europe is characterised by massive fragmentation of research efforts.

Such numbers indeed look appalling, but the question is whether they constitute accurate descriptions of the ERA. The experience gained by Members of Science Europe on the ground indicates that they do not.

The figures do not take into account some key forms of co-ordinated spending. The main one is the Framework Programme, which notably includes trans-national projects addressing societal challenges (these can be mostly mapped on the JPI topics, even though the JPIs tend to have narrower scopes). The exclusion of the Framework Programme is hard to justify, given that its main objective is indeed to integrate European research efforts and increase their scale. Evidence that the Framework Programme is successful in creating long-lasting trans-national networks around societally-relevant topics exists.¹⁵

Other forms of co-operation that are left out are intergovernmental programmes and agencies, as well as trans-national R&D performers such as the European Organization for Nuclear Research (CERN) and others. Using the EC's own figures, it can be estimated that, in 2010, 12% of national GBAORD was co-ordinated.¹⁶

However, the 12% figure also underestimates the actual level of co-ordination of research efforts in Europe.

A significant proportion of national R&D spending goes to fund research institutions (universities, research centres) which in turn pay for facilities, equipment and salaries. This type of spending is local in nature, and enables research institutions to carry out medium- or long-term planning. In some contexts, research institutions also have the ability to set up a proper scientific strategy, in consideration of their history, location and relative strengths.¹⁷ Such funding, usually called 'institutional' or 'block' funding, is considered by default as 'fragmented' funding in EC analyses. In reality, institutional funding is a kind of 'floor' funding that supports the very existence of research institutions. Such institutions can in turn engage in international collaboration, as any research institute would. It follows that considering national institutional funding as fragmented by default is arbitrary. The extent to which institutional funding is actually 'un-coordinated' depends on how far individual institutions co-operate internationally. Methodologically, it would make more sense to exclude institutional funding from the overall amount of R&D spending that can potentially be co-ordinated.

A more realistic analysis suggests that about one third of the research funds in Europe that can potentially be co-ordinated are so, as recently pointed out by the European Research Area and Innovation Committee (ERAC):

“ If one wants to measure **research agenda coordination**, meaning the trans-national cooperation resulting from policy decisions, then budget allocation decisions are a good indicator. But leaving out the FP and ESA from the calculation does not make sense. A correct calculation would indeed consider the FP, European level intergovernmental research programmes and agencies (such as ESA, EMBO, EUREKA, COST), FP instruments of coordination (ERA-NET, ERA-NET+, JTIs, JPIs, Art. 185), and most probably intergovernmental research infrastructures such as CERN, EMBL, ESO, ESARF, ILL, etc. This kind of calculation yields a number of research agenda coordination in Europe somewhere in the region of 10% of European public budget allocations to research.

If the objective is **collaboration between researchers**, then [...] the best indicator for this kind of collaboration, regardless of whether it is fostered by coordinated funding or by spontaneous, bottom-up contacts, is given by co-authorship data.¹⁸ ”

Co-authorship data give a better sense than input data of how dense Europe is as a research collaboration space. The graph below gives the percentage of documents in the Scopus database that are internationally co-authored by world region (Europe being split into West and East). Not only is Europe the place where research is least ‘fragmented’ in the world, but the level of international co-operation is surprising in terms of how high it is: about one in three papers are internationally co-authored. In some European countries, like France or Switzerland, internationally co-authored papers represent 50% or more of the total number of papers produced.

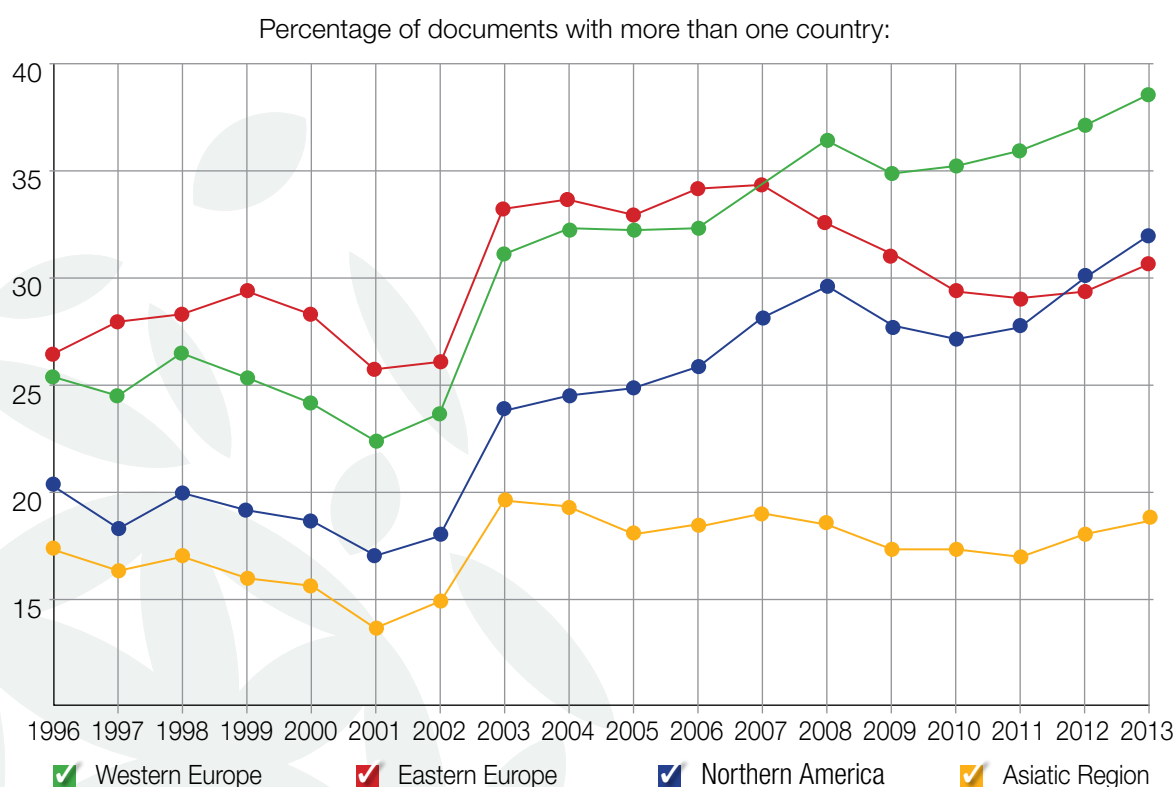


Figure 1: Percentage of internationally co-authored papers in different world regions (1996/2013). Source: SCImago. (2007). SJR — SCImago Journal & Country Rank. Retrieved March 04, 2015, from <http://www.scimagojr.com>

Additionally, some research looks into scientific collaboration from a disciplinary perspective. This is very important because both the type of discipline and the research landscape worldwide in terms of actors, their features and distribution determine very different collaboration dynamics and needs. For instance, a French team, IFRIS, looked into the field of nanosciences and technologies. For this field, it detected 81 research clusters in Europe. Europe was the only continent where inter-country links were almost as many as intra-country links. In the US, intra-country links were found to be 78% of the total, in Asia 72%, and in Europe 48%.¹⁹

In conclusion, once output data is used to look closely at the European research landscape, it is hard to find that fragmentation is a widespread issue.

This kind of data resonates with the experiences that the Science Europe Member Organisations have in their work with the scientific communities. In general, the proportion of nationally-funded research that is truly 'fragmented' is perceived as very low and claims about widespread 'fragmentation' and 'duplication' do not fit the evidence nor the experience on the ground. The fact that most national funding is not ear-marked for cross-border collaboration is at least as much a mere accounting issue as it is a collaboration issue.

'Fragmentation': Good or Bad?

Regardless of fragmentation levels, the question of whether fragmentation has a positive or negative impact should be raised explicitly and separately.

The view according to which fragmentation has a negative connotation builds on the assumption of endless economies of scale for the research enterprise.

There are at least three reasons why research may not be subject to endless economies of scale:

- 1. Reproducibility of research results:** the fragmentation narrative, and the consequent drive to ever-increasing alignment, raises the issue of preserving research reproducibility,²⁰ a key scientific principle and an issue on which journals like Nature have sounded the alarm.²¹ Reproducibility refers to the ability to replicate a study or an experiment in order to validate its results. There are indications that the research system is not doing enough to ensure the validation of research results by independent scientists. Reproducibility cannot be achieved without some degree of duplication of research capabilities.
- 2. The role of competition between research teams:** many of the world's major scientific advances fed on the fierce competition between different teams, constantly checking each other's data and trying to reproduce their respective results. In physiology or medicine, for example, Nobel Prizes are mostly assigned to researchers who competed in the same area of inquiry, using un-coordinated resources and never co-authoring a single paper.²² These cases show that bottom-up, duplicated efforts also have a clear role and strong impact, even in the societal challenges era of research policy.

3. Local knowledge networks and the need for place-specific research: while knowledge communities tend to be global, place-specific knowledge networks continue to play an important role. International research goals embedded in internationally co-ordinated or integrated programming tend to favour research fields whose relevance is less place-specific, both because of the goal of increasing the scale of research efforts, and because communities that are more international will be more successful in promoting their goals and more likely to publish in English.

Programming co-ordination, including JPIs, does not necessarily hurt reproducibility, competition or the survival of local knowledge networks. Nonetheless, when building a narrative to support the creation and design of a tool such as JPIs, it is important that the issue of fragmentation is not oversimplified. While there may be good reasons why diversity and duplication should be given a negative connotation, there may also be equally good reasons for diversity and duplication to have positive impacts. Fragmentation should never be used as a rhetorical device in the absence of clear evidence of a negative impact of diversity.

The good or bad nature of fragmentation needs to be assessed on a case-by-case basis.

By mapping fields to build Strategic Research Agendas, it is actually the very discussions within JPIs that help stakeholders understand where fragmentation is beneficial and when it is not.

A Different Way to Look at JPIs: Quality, not Quantity

JPIs identify societal challenges where scientific knowledge is essential for addressing them, and where building a critical mass is more important than diversity and duplication. Their role in building a critical mass does not exclusively depend on their cross-border nature, but also on their symbolic role, their ability to link the research and innovation chain, and to connect research and innovation activities with policy-making at different levels. Moreover, JPIs can be easily integrated in national policy mixes, complementing national strategies in a flexible way.

Developing a more nuanced view of the role of JPIs can help all policy stakeholders improve the focus of the debate and ultimately better leverage the potential of joint programming.

The EC observes that: “Member States may consider the possibility of further co-ordinating their research efforts whilst allocating more resources to their implementation.”²³

Science Europe proposes instead that the focus on the way forward for JPIs shifts from quantity to quality. The rationale driving policy decisions related to JPIs should be based on the real scientific impacts listed above (see Science Europe’s Experience with the Impact of Joint Programming) rather than on a narrative of fragmentation, especially fragmentation measured in terms of funds. On such a basis, it would also be easier to discuss how to make the most out of joint programming by ensuring that all Member States live up to their shared responsibilities and discuss their commitment more thoroughly.

Joint Programming Policy at a Crossroads

Science Europe believes that it is important to have this debate now.

On the future of joint programming, the EC has stated: “the Commission will launch a debate with Member States on the best possible level of coordination and alignment of national research strategies and pooling of funding in the domains of the societal challenges in order to increase impact at EU level. Possible outcomes could include defining a level of national funding to be spent within a coordinated European framework and measures to increase the number of countries committed to joint programming.”²⁴

Based on the considerations made throughout this Statement, Science Europe proposes a different approach to this debate and makes the following recommendations for future decisions on JPIs.

Recommendations

Recommendation 1: Base future discussions on a thorough assessment of existing JPIs, and focus future negotiations on fundamental issues

Firstly, it is proposed that any discussion is firmly based on a thorough evaluation of the existing JPIs in terms of their quality. This should be done by assessing each of the following points separately:

- Whether or not each JPI contributed to advancing its field of knowledge by providing a scale to research efforts that was unavailable via national or European programming;
- Whether or not each JPI had an impact in addressing the societal challenge associated to it; and
- Whether or not each JPI was efficient in terms of its operations and reasonable in terms of management required.

Such evaluation should form the basis for discussion of the following **fundamental issues**:

- Is joint programming efficient and successful in advancing progress on societal challenges?
- How do JPIs complement a strategic approach to societal challenges with the competition, reproducibility and duplication required for scientific endeavours?
- How can Member States best engage with the joint programming process in terms of shared responsibility?

Furthermore, on an operational level, a set of **practical issues** should be discussed:

- Alignment of institutionalised budgets and activities;
- Alignment and rationalisation of the administrative processing of grant applications to ensure transparency and avoid overly bureaucratic procedures;
- Alignment between JPIs and other initiatives aimed at similar challenges, but from a different perspective, such as European Innovation Partnerships, Knowledge and Innovation Communities, ERA-NETs and the Horizon 2020 Societal Challenges pillar;

- Widening the geographical scope of JPIs from mostly European to global; and
- Sharing best practices between the JPIs.

Recommendation 2: Open up the JPI governance to stakeholder input

Joint programming is based on close collaboration and co-ordination across policy levels, as well as expertise on a variety of different aspects ranging from research content to programme design and management. As a consequence, the governance around JPIs is actually key to ensuring their success and the full exploitation of their potential.

The Members of Science Europe have developed a rich body of experience on strategic and practical aspects of JPI involvement, as well as a sense of ownership of the JPIs they are involved in. The fundamental reason for this is that, as recalled above, JPIs bring together strategic, operational and research aspects at once. Decisions at all levels are interdependent, and steering the JPIs to success will be difficult if the governance does not involve the relevant stakeholders.

Conclusion

Principles for Future Decisions on JPIs

In conclusion, Science Europe invites all JPI stakeholders to chart the way forward for JPIs keeping in mind the following principles:

- JPIs should be framed within a narrative that reflects their actual implementation, impact and role and does justice to it.
- Decisions on existing JPIs should never be based on 'quantity' considerations. The added value of JPIs very much depends on their field and content, and horizontal funding targets can be highly misleading.
- Case-by-case analysis is a necessary condition for sound decision-making on new JPIs.
- The European-level decision-making process on JPIs should more closely reflect and resemble national processes, where ministries usually make decisions and discuss commitments jointly with national Research Funding and Research Performing Organisations. Science Europe is ready to contribute and to be involved in discussions on JPIs.
- No decision on JPIs should be taken in the absence of an assessment of existing JPIs, and future debates on policy options should use such assessment as a starting point.

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Colophon

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Author: Science Europe

For further information please contact Science Europe Office: office@scienceeurope.org

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To contact Science Europe, email office@scienceeurope.org.



Science Europe
Rue de la Science 14
1040 Brussels
Belgium

Tel +32 (0)2 226 03 00
Fax +32 (0)2 226 03 01
office@scienceeurope.org
www.scienceeurope.org

