

Proposal for a new ESF MO Forum

Indicators of internationalization : a pilot study to design and develop common indicators

This proposal has been designed by a Working group of the MO Forum on *Evaluation of Funding schemes and Research Programmes*. The pilot study which is proposed below aims to design and to produce a set of indicators that could account for the internationalization of European research activities and programmes and be useful for MOs themselves – be it Research Performing Organisations, Funding Agencies or Learned Societies - and in their relationships with European Commission as well as their governments (for benchmarking and policy evaluation).

As we believe that supporting such a pilot study fully enters in ESF's mission to foster joint activities, we submit this project to ESF Governing Council as a specific new Forum.

MO Forum supporters:

CNR, Italy; INFN; Italy; KNAW; The Netherlands; INRA, France; FAS, Sweden

1 Context and rationale of the project

During the first workshop of the *Evaluation of Funding schemes and Research Programmes* Forum in Berlin, whose purpose was to identify the main topics that are encompassed within the issue of ex-post evaluation, the topic of indicators has been strongly noted as a major one. That was confirmed in Rome in the second workshop. The working group of MOs (CNR, INFN, Royal Netherlands Academy of Arts and Sciences (KNAW), INRA) that met to explore more precisely this very broad issue proposed two key areas to be worked out in Vienna in the third workshop:

- internationalization (see below)
- Innovation and innovative capacity.

It has been noted that concerning this second area there was a tremendous discrepancy between the very rich knowledge that has been built on innovation processes by economists and other social scientists and the very limited set of indicators that are usually produced and used. Therefore, the production of current indicators would not add value and the purpose should be more on designing new indicators that could better describe the innovative capacities. To achieve such an objective goes certainly beyond the capacity of a Forum and it was proposed that ESF as such convenes a dedicated exploratory workshop on that topic, gathering scientists involved in innovation processes analysis and MOs interested in developing new indicators on innovation and innovative capacities.

Concerning indicators on internationalization, the rationale of the identification of that area in this proposal is strictly related to the concept of ERA. All the MOs have considered very useful this ERA concept and agree that it could not be enforced without a strong mobilisation of the European research actors, be they funding agencies, research performing organisation or learned societies. The concept of ERA

and its implementation means to organise research in Europe in ways that are leading to strengthening cooperation within Europe to better compete and collaborate at the international level. On the EU website, the goals of the ERA are described as follows:

- *Enable researchers to move and interact seamlessly, benefit from world-class infrastructures and work with excellent networks of research institutions;*
- *Share, teach, value and use knowledge effectively for social, business and policy purposes;*
- *Optimise and open European, national and regional research programmes in order to support the best research throughout Europe and coordinate these programmes to address major challenges together;*
- *Develop strong links with partners around the world so that Europe benefits from the worldwide progress of knowledge, contributes to global development and takes a leading role in international initiatives to solve global issues.*

It is clear from these goals that the idea of ERA is not Europeanization as an end by itself – even though it is important and useful to assess European cooperation in progress - but it is a mean to achieve a strong and effective European research base in a global perspective. Internationalization is then on the one hand a concept that addresses the necessity of growing collaboration between European partners, on the other the need to further develop strong links with partners world wide. The concept of internationalization in the context of ERA is therefore a two-tier ‘system’ to increase the capacity of European research to compete and collaborate at the international level in fostering complementarities, reducing redundancies and promoting world class research. It is a response to balancing cooperation and competition at the scale of Europe and the world simultaneously.

Being engaged in the realisation of the ERA concept, ESF will be accountable for the various aspects of its implementation, among which the effective improvement of Europeanization/internationalization of our research capacities. Accountability can be (and often is) represented through indicators. Ideally, an indicator or a set of indicators is an instrument to provide the most appropriate and reachable description of the object to characterise.

2 Main features of the Forum and the Pilot Study

Background of the Study

Public research organisations (PROs) are key components of the R&D systems. Few indicators can outline their importance in term of resources mobilised: PROs represent 14% of the total R&D expenditures-GERD; 40% of total Government expenditures for R&D-GOVERD in EU15. The relevance of PROs is different in national R&D systems: for instance they account from 18-20% of GERD in France, Italy and Portugal, to 4% in Sweden and Belgium. Furthermore, different institutional configurations of PROs are present between and within the European countries: public, semi-public, private-privatised centres, (Eurolabs, 2002), and different missions orienting the types of activities they develop: research and development, technology and innovation services to enterprise, supporting to governments and other clients, technical norms and standards, constructing, operating and maintaining key facilities (LSF, large computing facilities, large long-term data collections).

EURAB (EURAB, 2005) identified three main missions of PROs; they can be

- a) *Policy-oriented institutions* (assisting government for decision making in sectors such as health, energy, environment, defence, transport, etc.) like the EPICs in France or Government Research Units in Italy;
- b) *Industry-oriented institutions*, devoted to translate knowledge into useful application, to create linkages between basic research results and applied research, to develop cooperation with industry (like TNO in the Netherlands and SINTEF in Norway);
- c) *Academic-oriented institutions*, operating through labs, on both basic and applied research domains, in close connection with Universities, like CNR and INFN in Italy, EPST in France.

According to the different type of institutions they represent, there are different factors affecting the PROs performance, and acting as drivers for changes. In this respect, we can outline changes in Government funding (more project funding and substantial reduction of core funding), marketization processes (increasing relevance of the contract from industry, importance of the capability to attract funding from the market, push towards patenting and commercialising the research outcome), public policies (especially those oriented toward priorities such as internationalization, and innovation-oriented initiatives), institutional autonomy and freedom of research of individuals, changes in the modes of knowledge production according to the disciplinary areas and the specific sectors they are dealing with, the types of steering instruments devoted to enhance accountability (particularly funding and evaluation).

In this context, internationalization is becoming more and more a great concern because of its strict relation with globalisation processes. We can consider internationalization as an intrinsic characteristic of the research effort, affecting all the scientific disciplines with different rate and pace. Nevertheless, in recent years a trade off between internationalization as epistemic value and its effectiveness in terms of activities, performance and positioning is emerging.

internationalization is a growing phenomenon due to the globalization of economies, the enlargement of competition for good researchers and research funds, the need to improve reputation and visibility at the knowledge frontier (quality indicator). Changing meanings of internationalization is another issue challenging PROs: in the last ten years, research priorities went from internationalization of researchers and research groups to embedment of institutions and individuals in international networks, capability to attract foreigners (researchers, clients) as well as to fund researchers working abroad, and to localize research activities abroad (researchers and units). In this respect one cannot ignore the role of the European Framework Programmes and the actions toward the setting of a European Research Area (ERA), and the Lisbon strategy as factors pushing public research institutions toward internationalization.

We have little empirical evidences on PROs internationalization and a limited use of indicators to analyse or to assess this process. Outcome from the RISE project (2000), which surveyed 223 research institutes in Germany, Netherlands, Sweden and UK, underlined that 43% have a “very low international business orientation” measured by synthetic indicators including research contracts from foreign industry clients and the establishment of branch/representative offices abroad. In 2002 EUROLABS project surveyed 770 institutes. Indicators (co-publication, collaborative projects, funding from external sources) showed different levels of internationalization according to the type of research (basic-applied-development) and the type of

institution (public, semi-public, private). Lastly, Bergen and Hofer (2008) analysed PROs in Germany and the results collected showed that: researchers had a low international mobility, but PROs employed a high share of foreign researchers comparing with Universities; internationalization was linked to the type of research developed (non-oriented research institutes were more internationalized than applied-oriented ones); 57% of PROs had a specialized unit for internationalization, 39% had an explicit international strategy; the share of foreign industry clients was low (projects with foreign partners).

Looking at national experiences of institutional evaluation, which made reference to internationalization as a criteria for the assessment of PROs' research performance (Reale, 2008), we can see that this feature is detected through indicators able to outline different capabilities, such as publications in international journals, attractiveness of external sources, gaining balanced rates of brain drain and brain gain, localization of administrative sites or research units abroad as well the capability to attract funding from abroad (EUFP, International projects, ESA, Firms, Non-for-profit, etc.). Nevertheless, there is the need to cope with the lack of conceptualisation of these indicators, because the notion of internationalization is strongly oriented by the different knowledge regimes, it is characterised by disciplinary areas and sectors (Bonaccorsi, 2008), and it is affected by the different configurations of the PROs themselves. Furthermore, there is the need to set up the differences between Internationalization and Europeanization (see paragraph 1).

The work on indicators

Indicators are based on conceptual framework coming from STI studies (i.e. the linear model or the national innovation system model), definitions and normative understanding of the underlying reality. Indicators are used as instruments devoted to support policy makers with a synthetic representation of the reality, not a complete and objective description of the reality (in this respect they are proxies of the reality). Good indicators should be:

- designed for answering specific questions (relevance)
- built upon a conceptual model of the reality (thus, they must be based on definitions, state-of-the-art, delimitation of the elements to be measured)
- feasible in terms of data quality and availability (cost and time)
- transparent in terms of capability of users to understand background and limitations affecting indicators

A possible way forward in order to build up indicators for the evaluation of the internationalization of PROs, is to work on a definition of internationalization and Europeanisation, by taking into account different perspectives coming from the economic, the sociological and the political approaches, trying to identify few common characteristics. Then it is possible to work on the identification and the testing of indicators suitable to highlight the real level of internationalization of PROs. It is necessary for this purpose to distinguish between indicators that can be developed by using international sources and indicators that can be developed by using national sources. As to the first, co-publication and co-patenting with foreign researchers (by using bibliometric resources, and EPO databases), and an analysis in diachronic perspective of the participation to international programme can be carried out (for instance for EUFP by using Cordis resources).

As to the second, we must be more cautious, because developing indicators using national sources implies hard work on definitions and methodologies in order to have

comparable measures. Thus, this part of the work should be more explorative, and concentrated on a small set of indicators, according to the data availability at institutional level.

In the context of ERA, an appropriate set of indicators should aim to measure the two tiers of internationalization : (i) the intensity and effectiveness of intra-European cooperation; (ii) and related to it, the upgrading of European research competitiveness and collaboration at the world level.

This general objective should be based on the management experience of the MOs in that field where they are currently producing indicators to describe as appropriately as possible their embedment in international (European and global) cooperation and competition. That means that the proposed pilot study should definitely be a bottom-up process (which is the rule for ESF to support joint activities) through which we would better understand mainly:

- the different experience and history of European/international cooperation and competition
- the different needs and practices of research fields (both disciplinary and multi- inter- and trans-disciplinary areas)
- the size of the Institutions,
- their role in their own national system.

The second basic point is that the design of the set of indicators should contribute to the development of a common strategic analysis of internationalization among various kind of institutions (Research Performing Organisations, Funding Agencies, Learned Societies) that are gathered within ESF. It is a permanent care of ESF to help and foster the convergence of strategic analysis among its MOs. In the case of internationalization, that is common to those different institutions, they have not exactly the same objectives and therefore do not use the same set of indicators. The pilot study will aim at designing a common set of indicators for RPOs, FAs and LSs.

To be feasible, the project of the pilot study would be to design a small set of indicators focused on those that are expected to be used as tools to assess the effectiveness of the concept of ERA with respect to the two-tier concept of internationalization. This set of indicators could show both the level of collaboration within Europe and the level of success in terms of results (output and relevance) in the global perspective. These indicators would show how large European cooperation is and provide means to enhance international competitiveness through better cooperation.

3 Brief content

This project comprises 4 steps:

- A) A modest review of current documents and instruments regarding the European strive towards internationalization , in particular in the context of the 2007 Green paper and the following Ljubljana process (2008) regarding the free flow of researchers, knowledge and technology (the “ fifth freedom”). This should lead towards an elaboration of the two tier view on internationalization that was mentioned above. In addition an overview should be made of existing practices of stimulating and assessing/measuring internationalization among

the participating organizations. Among the variety of the forms of collaboration, the project will include those that are relevant for different disciplines or fields of research, for different types of research (science oriented, policy oriented, industry oriented) and for different institutional organizations: research performing organizations, research councils, universities, academies;

- B) Then a review should be done of concrete indicators and data used by the organizations to measure the two tiers of internationalization, or any other facet that might seem relevant in the ERA context. Among other, the review should present information about the rationale behind the choice of indicators and about the availability and robustness of the data used.
- C) Next an operational step will have to be made that will result in: i) a full description of a set of common indicators and guidelines for their production; ii) operational recommendations to implement and maintain these indicators for a larger range of research institutions and for a repeated use that would allow for assessing the internationalization ambitions of the ERA.
- D) A test phase for one or more of these indicators for a selected number of participating institutions, including a benchmarking operation.

The project will be executed by a small group of experts under the guidance of our working group. The present group that took the initiative will be hopefully enlarged to about ten MOs.

4 Organization, deliverables and planning

The timeline and organization proposed for the exploitation of this Forum mirror the specific approach chosen, which includes the notion of a Pilot Project. In this context, two broad phases can be identified. The first one (Step A and B below: design phase) is driven by the small number of MOs supporting the Forum and by the Expert Group. At the end of this phase a broad call to all other ESF MOs can be issued to start the second phase (Step C and D below: production and benchmarking), aiming at the final testing and production of the designed indicators and the corresponding benchmarking of the agreeing MOs.

The project will be overseen by a *Working Group plus (WG+)*, composed by the MOs proposing this Forum, and one or two representatives of the ESF. They will select the experts that will actually conduct the study and convene with them during the Dublin meeting (fall 2009).

WG+ will manage the project and make the necessary decisions after each step. It will validate the final report of phase 1 and communicate the results. It will decide together with the experts how and when to launch the second phase (data design, data gathering and indicator production).

Tentative planning and deliverables

STEP A : A review of current policies and practices in the MOs with respect to the internationalization in view of the ERA ambitions.

Actors : WG+ and experts

Schedule : From November 2009 (Dublin meeting) to March 2010

Deliverable : a document in which an overview of existing policy developments in view of internationalization in the light of the ERA (green paper, Ljubljana agreement), and practices to assess internationalization in MOs.

STEP B : on the basis of A, an informed review ('best practices') on indicators or indications actually used by MOs, document analysis and web searches. This should also include the identification of useful existing databases.

Actors : experts, WG+ and MO's

Schedule : March 2010 to September 2010

Deliverable : Report to the ESF / MO Forum in September/October 2010. The report should summarize the results of step A and B, and present a set of indicators and a review of the available data. This is the time for an enlarged Workshop with a call to any other MO interested to join the second phase of the Forum.

STEP C : Selection of a set of possible indicators and operational recommendations to develop and maintain them. Selection on the basis of discussion with stakeholders (focus group, via video conference)

Actors : experts

Schedule : October 2010 to March 2011

Deliverable : Report including a set of indicators ready for testing, to be presented on a small conference of the ESF MO forum. On the basis of this a decision will be made for the next step..

STEP D : Test phase. One or more indicators will be tested in a number of selected MO's and at the European level. The test will regard both the technical aspects (a.o. data gathering, robustness, possible benchmarking) and implementation options.

Actors : experts, WG+

Schedule : March 2011 to November 2011

Deliverable : Final report including test results and a vision on internationalization in view of the ERA / Ljubljana ambitions.

Finances and working schedule

We expect MOs of the WG to contribute in time, people and meeting facilities (be it real or virtual). We expect other MOs to contribute in time and information. To cover the cost of the experts we ask ESF to consider a contribution. The cost of the experts will be travel and subsistence and a consulting fee, however not on commercial basis but on what is reasonable in the public sphere. A rough estimate for the expert costs of this study will be 30-50 K€ for the period of fall 2009 until fall 2011.

Annex 1

Table 1 : Example of costs estimation

<i>Dates</i>	<i>Action</i>	<i>Cost</i>	<i>Supported by</i>
Step A November 2009 - March 2010	Dublin Meeting and first WG+/expert meeting and brainstorming	Research/writing (5000 €)	ESF
Step B March 2010 – September 2010	Interviews of MOs, data gathering, expert report	Travel, subsistence and research (15000 €)	MOs (travel and subsistence), ESF (research)
Step C October 2010	Meeting of experts and WG+ to discuss the conclusions of the report and enlarged Workshop	Travel and subsistence (3000 €)	MOs and ESF for the experts
Step C October 2010- March 2011	Selection of indicators, focus groups, recommendations for implementation and maintenance	Desk research, interviews (10 000 €)	ESF
Step D March 2011- November 2011	Testing of indicators, including benchmarking, and final report	Research (10 000 €)	ESF
Step D: November 2011	Final Workshop: discussion of final report and wider communication to MOs EU)	Travel and subsistence, (5 000 – 10 000 €)	MO's and ESF

Total cost: about 50 K euro

Estimated cost for ESF: 40 K euro