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Evaluating the uptake and impact of participation in the European RTD Framework Programmes in Member States and Associated Countries

Presentation

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1. Study objectives

Overall objective

- Assess the uptake and impact of participation in the RTD Framework Programmes ("FPs") in 28 EU Member States ("MS") and 13 Associated Countries ("AC") in FP6 FP7 and early part of H2020.

Specific objectives

- Provide an analysis of the **national research and innovation** ("R&I") landscape and policies during the past 15 years.
- **Analyse FP participation patterns**, including drivers and inhibitors.
- Assess the **impact and added value** of FP participation.
- Provide **recommendations** and develop a **taxonomy of factors** conducive to generating lasting impact of the FPs at country level.

2. Context

EU and national level context

- Interim evaluation of Horizon 2020
- ERAC working group - new guidelines to help MS/ AC to assess impacts
- National evaluations of FP impacts e.g. DE, DK, FR, IS, NO, SE, UK.
- Strengthening FP participation - political importance:
  - Reduced resources for R&I in some MS/ AC
  - Accountability / desire to improve “return ratios”/ ROI
- Statistical interpretation issues:
  - FP6 - variable data quality / comparability
  - Decline in % share of FP funding in some large MS (e.g. DE, FR, IT) – but EU enlargement process.
  - Small MS and AC - difficult to analyse performance when absolute no. participations is limited
  - In H2020, av. project size increased - even where total participations have declined, positive evolution possible

Study Tasks / Methodology (1)

Task	Tools/Outputs

Task 1: Assessment of how national research and innovation landscape and policies have evolved in the past 15 years in each MS/AC	• Literature review
	  ▪ EU level
	  ▪ National/regional level
	• (Validation) Interviews
	Outputs: 41 country fiches outlining the national / regional R&I system

Task 2: Assessment of evolution of participation patterns in RTD FPs in each MS/AC during the past 15 years	• Desk research
	  ▪ Analysis of quantitative participation data
	  ▪ Analysis of previous evaluation studies and meta evaluations
	• Interviews
	Outputs: written analysis, visualisations, case studies (also see Task 3)

Task 3: Assessment and description of quantitative and qualitative impact of FP participation on each MS/AC	• Desk research • Interviews **Outputs:** 41 case studies

Study Tasks / Methodology (2)

Task	Tools/Outputs
Task 4: Present list of different forms of impact of FPs in MS/AC groupings and assess which general factors are conducive to generating lasting impact of FPs in MS/AC	• Synthesis analyses of the previous Tasks ▪ Additional desk research ▪ Follow up interviews and validation exercises **Outputs**: written analysis and supporting visuals.
Task 5: Organisation of a validation workshop	• Validation workshop **Outputs:** summary of workshop, written analysis and supporting visuals (final reporting)

Final analysis and reporting

3. Evolution of participation patterns in FPs in each MS/AC during the last 15 years

- Analysis of participation rates identified considerable variance in performance. Examples of countries that **significantly improved performance** between:
  - FP6 and FP7 – DK, FI, IL, UK
  - FP7 and H2020 – LU, NL, CY, SI
  - FP6 through to H2020 – EE, IE, NL
- Countries where participation was ……..
  - **Stable** between FP6 and H2020 e.g. ES, IS, LV, MD
  - **Declined significantly** between FP6 and H2020 e.g. DE (by 5.5%), FR (by 6%), IT (by 3%), EL (1.3%) and in FP7-H2020 CH (by 2.8%).
  - **Declined marginally** between FP6 and H2020 e.g. BG, CZ, HU
- Difficult to develop a country categorisation framework that explains relative success. Complex heterogeneous factors influence FP performance.
- Some MS have a strong R&D&I system and research infrastructure (FR) but have not been that successful.
- But common characteristics for MS/AC that improved performance over successive FPs:
  - Strong performance on the European Innovation Scoreboard/ key R&D&I metrics.
  - Strong national R&D&I capacity (including systems / structures)
  - Investment in, and professionalisation of support structures

4. Poland: context & participation patterns FP6- H2020

- Positive trajectory in R&I indicators - business R&D investment growing, doubling of foreign R&I investment between 2007-2014 (€5.1 - 9.0 billion).
- But GERD only one-third of EU average (target 1.7%), SMEs are less innovative than EU average, low citations of scientific publications, lack of R&D tax incentives
- FP6 - lack of alignment between RTD policy framework and PL R&I system. Since then, trends such as Europeanisation, globalisation and spread of ICT have affected R&D policy and systems. Better alignment today.
- Significant leap in PL's participation rate from FP6 to FP7 (0.23% to 0.99%). But small reduction between FP7 and H2020 (0.88%) H2020 to date - 826 participants receiving €188,00 million. 156 SMEs receiving € 37,80 million
- Success rate in applying for FP7 close to overall EU13 average.
- But PL underperforming compared with size of its R&D employment sector.
- RoI needs strengthening - relatively low success rate in FP applications and smaller average budget among projects financed.
- Thematic strengths - ICT for the environment, ICT for security, Organic and Large Scale Electronics and Intelligent Content and Semantics (increased FP6 to FP7), photonics, nanoelectronics and nanosystems

4. Poland: context & participation patterns FP6- H2020 (cont.)

- Incentives measures to strengthen participation

But disincentives too:

- Language issues, difficulties for newcomers, salaries (H2020 only)
- Financing for R&I projects & research infrastructure funded through state budget and Structural Funds (e.g. Innovative Economy OP 2007-2013 and through ESIFs).
- Ratio of FP7/ERDF funding in PL is 0.03 (3.8 in Denmark, 3.5 in Belgium)

Strengths and weaknesses in R&I system, policies and programmes influence participation levels:

- **Strengths**
  - High ESIF allocations for R&I in 2014-2020
  - Fast-track funding decisions in R&I support measures, 2014-2020
  - Growing emphasis on commercialisation of R&D results
  - Policy focus on stimulating science-industry collaboration
- **Weaknesses**
  - Design of some ERDF R&I support measures in 2007-2013 (RIO report). Dedicated measure to increase H2020-readiness of SMEs was eliminated from Poland's OP (S2E)
  - Low salaries in the science sector (public) with difficulties in attracting researchers to take part in FPs
  - Lack of national funding for ‘second chance’ applicants (i.e. that scored highly in FP applications but that were not funded). “Seal of excellence” - budget constraints

4. Evolution of participation patterns in FPs in each MS/AC during the last 15 years

Obstacles and disincentives to FP participation

- Perception among industry and SMEs of heavy reporting burdens (despite progress in simplifying administrative aspects of participation (FP7, H2020).
- Strong competition/ low success rates, esp. for applicants from some EU13 MS.
- Timeframe for FP projects may be insufficiently short for SMEs/ industry to meet rapidly evolving market needs. Complicates future commercialisation.
- Availability of alternative financing sources may deter applications to FPs e.g.:
  - Relatively generous national R&I funding schemes - FR, SE).
  - ESIFs seen as being easier to apply for (no language barrier, higher success rates).
- Concerns in MS / AC with a low baseline in respect of R&I capacity / performance as to ability to compete for international R&I funding.

5. Evolution of participation patterns in FPs in each MS/AC during the last 15 years (1)

National drivers for increasing FP participation

- Wide variety of incentives schemes/ measures to facilitate FP participation
  - Matchmaking / networking events.
  - Training / capacity-building in how to produce successful FP proposals.
  - Technical support for proposal development (assist with non-R&I aspects).
  - Reward payments to successful applicants and/or payments for unsuccessful applicants.
  - Imposing requirements in ESIFs that beneficiaries of R&I schemes must develop FP applications as ex-ante condition of funding.
  - Second chance schemes for unsuccessful applicants (mirroring Seal of Excellence programme).
  - Adding prestige to your national R&I funding application.
  - Career development – good ex's of integration into appraisal and progression criteria, but lack of formal recognition of FP participation in some MS.

- Whilst incentives help to encourage participation, may not be enough to overcome disincentives (explained under "barriers" slide).

6. Evolution of participation patterns in FPs in each MS/AC during the last 15 years (2)

Other factors influencing participation rates

- National support systems in place (NCPs etc.), but their effectiveness varies depending on training, extent of dedicated resources, national baseline of R&D&I capacity etc.
- Some countries have set up support systems among universities / PROs with dedicated staff and technical capacity enhanced through peer learning.
- Global economic and financial crisis limited scope for national governments to invest in competitive R&I programmes in a number of countries.
- Some countries developed strategies to align R&I systems with the FPs (AT) and even passed legislation requiring national alignment between national/ EU priorities (FR).
- However, weak implementation in practice of alignment between the FPs and national R&D&I policies/ programmes (ERA Watch reports, current study).
- Some MS and selected AC are much more active and influential in shaping evolution new FPs and definition of work programmes / thematic calls than others.

7. Longitudinal and cumulative impacts of FP participation (1)

Methodological Issues

- Conventional programme evaluation has innate weaknesses:
  - Synchronising evaluation and monitoring cycles within programme planning
  - Timing for materialisation of (many) intermediate results and impacts
- Assessing longitudinal (and cumulative) impacts is challenging….
  - Many FP outcomes are project-specific - aggregating across different project types.
  - Traceability of impacts (e.g. lack of consistency in citations, project-based approach with lack of continuity in staffing for follow-up e.g. surveys).
  - Cumulative impacts over successive FP projects at different levels – institutional capacity-building, project coordinators/ individual researchers).
  - However, scientific knowledge accumulated over several FP/ non-FP projects causes attribution difficulties.

8. Longitudinal and cumulative impacts of FP participation (2)

Scientific impacts

- Promoting world-class science
- Enhancing knowledge economy through generation of new knowledge/ scientific advancement
- Developing and utilising new and innovative methodologies, equipment, techniques, technologies, and cross-disciplinary approaches
- Developing expertise and knowledge in multi-disciplinary areas
- Delivering and training highly-skilled researchers and promoting their mobility

R&I systems impacts

- Networking effects: Strengthening cooperation between universities, research institutions, SMEs
- Changing organisational culture and practices
- Enhancing research capacity, knowledge and skills of businesses and organisations
- Promoting uptake of advanced manufacturing and key enabling technologies (KETs)

Policy impacts

- Contributing towards evidence based policy-making
- Influencing public policies and legislation at a local, regional, national and international level
- Encouraging alignment of EU and national R&I policies and programming approaches, with scope for synergies (context - scarce resources in FP9?)
- Greater emphasis on societal challenges and excellent science at national level

9. Longitudinal and cumulative impacts of FP participation (3)

Economic impacts and impacts on innovation

- Contributing toward wealth creation and economic prosperity; enhancing business revenue and innovative capacity
- Commercialisation and exploitation of scientific knowledge, leading to creation of new spin-out companies, processes, products and services
- Enhancing the efficiency, performance and sustainability of businesses/ organisations
- Attracting R&D investment from global businesses

Societal impacts

- Tackling societal challenges
- Enhancing cultural enrichment, quality of life, health and well-being
- Improving social welfare, social cohesion and/or national security
- Contributing toward environmental sustainability, protection and impact reduction
- Contributing to increasing public awareness and understanding of science and socioeconomics
- Contributing towards evidence based policy-making and its transformation into practice and informing professional and policy practices
- Influencing public policies and legislation at a local, regional, national and international level

10. Conclusions – maximising impacts (1)

- Assessment of impacts dependent on i) national R&I baseline, ii) length and type of participation, and iii) data availability at national and regional level.
- Categorisations of countries and impacts are possible, although not direct comparisons.
- Focus has been on scientific impacts, impacts on innovation, impacts relating to the overall R&I systems, economic impacts, wider societal impacts, policy impacts, and – where applicable – regional/ community impacts (NUTS2/NUTS3 level).
- Many impacts are cross-cutting, i.e. cover more than one category and/or component of the R&I system.
- Impacts can also be top-down or driven by changes from the bottom up.
- Many impacts are interrelated and/or interdependent – e.g. Impact B is likely to follow after Impact A has been observed, or Impact B is dependent on Impact A occurring first.
- Example - R&I systems impacts (e.g. reforms of higher education systems) may follow after initial scientific impacts have been made (e.g. raising excellence and collaborative behaviour among FP researchers). This helps prompt call for change in overall system.

10. Impacts of FPs in Poland

- Diverse, positive impacts of FP participation in PL, but low participation rates means that impacts difficult to discern at macro level (unlike ESIFs).
- Overall, impacts may significantly increase in future as ESIFs resources diminish and PL R&I actors apply more frequently for competitive R&I funding.

Scientific impacts

- Promoting world-class science - impact on % of researchers in (high-quality) international collaborations was assessed to be medium-high.
- PL research teams had opportunity to participate in international research projects
- Impact of collaboration low on proportion of scientific articles (including co-produced) published in high-impact journals low.
- Results below expectations, considering large human potential of Polish science
- FPs promote quality researchers (in disciplines with existing strengths e.g. biotechnology, chemistry but also new disciplines)

R&I systems and structures impacts

- Europeanisation of PL R&I system - changes in way institutions in national R&I system interact with EU partners and EU system.
- Organisational cultural changes - including on RTOs and HEIs.

10. Impacts of FPs in Poland

Policy and funding impacts

- Closer alignment and integration of PL R&I policies with EU RTD FPs
- Changes in funding structures and approaches e.g. launch of direct calls for R&I projects

Economic impacts and impacts on innovation

- Large country/ relatively low participation in FPs. Limited macro impact on economy
- Some evidence of high-skilled employment opportunities created, some spin-offs or spin-outs but lack of monitoring data/ systematic analysis
- Programmes supporting technology transfer have been established, but work to strengthen human capital (expertise in early stage of innovation management) needed
- Some scope for commercialisation e.g. projects with high TRL

Societal impacts

- Positive changes observed inside research teams and institutions engaged, however they do not spread wider to the whole research society nor to the public

11. Conclusions – maximising impacts (2)

- **Scientific impacts**: scientific impacts, tend to be one of the most immediate and, by far, the type of impact most documented. Generally scientific impacts can also be attributed (at least in part) to FP participation.
- Scientific impacts dependent on accumulated kind of FP participation, e.g.
  - Participation of individual researchers in grant schemes such as the ERC, MSCA are important for internationalisation of research and the mobility/ exchange of knowledge.
  - Coordination of (large) FP projects is strategically important both on a participant level but the strategic benefits can stretch further in particular if the area of research is inline with overall R&I priorities.
- **R&I systems impacts** can be traced back to EU policy initiatives as well as to national organisational reforms. Pronounced outcome - strengthening cooperation between universities, research institutions within countries, in the region and internationally. FP participation therefore also contributes to behavioural changes.
- **Policy impacts** - particularly prominent among countries that are preparing for close association to the EU in general and the FPs specifically (as an Associated or Third Country) Smaller capacity countries also tend to see stronger impacts in this regard.

12. Conclusions – maximising impacts (3)

Economic impacts

- Measuring RoI can be negative in the short and even medium-term, given long-term strategic benefits of FPs.
- From a national perspective, economic impact is generally considered to be 'marginal' or in 'niche' sectors. Lack of culture of assessment of such impacts within R&I evaluation.
- FP participation can also lead to economic impacts indirectly/ in the longer-term. Successful FP participation creates political incentives to allow for incremental increase in R&D spending nationally, leading to more capacity and improved competitiveness.

Impacts on innovation

- Varied and sector-dependent. Innovation promoted within industry value-chains.
- Commercialisation of R&I – less evidence than expected, but transition in H2020 to higher TRLs is making a difference (FTI Pilot, SME Instrument).

Societal impacts

- Focus on societal challenges in H2020 considered strongly relevant - impacted evolution of national policy frameworks.
- Improving evidence base around policymaking and on environmental awareness/processes and regulation.

13. Recommendations – national level

- Better align national strategies with FP pillars and thematic priority areas for intervention in order to **avoid overlap** (intervention logic of FP participation).
- Ensure **sufficient national support to maximise participation in, and the impact of FP participation** – both strategic (e.g. capacity-building, ensuring appropriate framework conditions), and national and localised support structures.
- Putting in place appropriate R&I strategies and support systems is also relevant at an i**nstitutional and industry level** (including on capacity issues, e.g. reversing brain drain).
- **Incentives** to promote **internationalisation of R&I in general and FP participation** in particular should be integrated more systematically into the national R&I system.
- **National funding schemes** should **enhance FP funding** not compete with FP funding.
- Prioritise **national resources** and **support measures by targeting researcher performers** that are presently under-represented. Also prioritise these actors in policies and strategies.
- National R&I actors need to **activity engage with EU R&I policy** (smaller capacity countries can collaborate in highlighting common themes).
- Some R&I strategies place an emphasis on **strengthening framework conditions** but more needs to be done to systematise approaches.
- Carry out **evaluation and monitoring of FP participation** to assess progress (and mechanisms behind progress).