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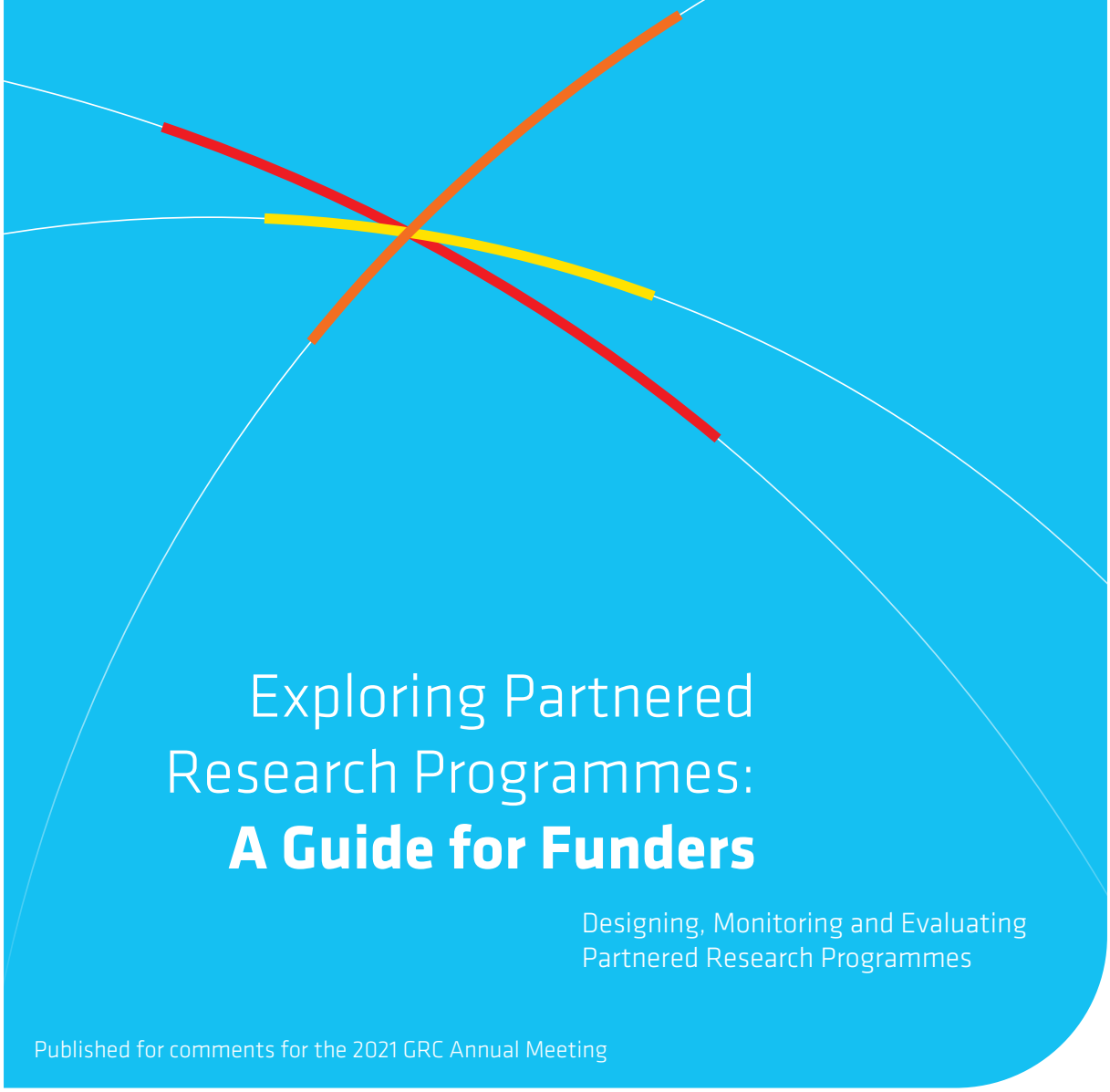

Exploring Partnered Research Programmes: **A Guide for Funders**

Designing, Monitoring and Evaluating Partnered Research Programmes

Published for comments for the 2021 GRC Annual Meeting

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Working Group Partners

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Introduction

1.0.

Acronyms

ANII	Agencia Nacional de Investigación e Innovación, Uruguay
CONACYT	Consejo Nacional de Ciencia y Tecnología de México, Mexico
CONCYTEC	Consejo Nacional de Ciencia, Tecnología e Innovación Tecnológica, Peru
CONICET	Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina
CNRST	Centre National pour la Recherche Scientifique et Technique, Morocco
EC	European Commission
EDI	Equity, diversity & inclusion
EoI	Expression of interest
EU	European Union
FAPESP	Fundação de Amparo à Pesquisa do Estado de São Paulo, Brazil
GRC	Global Research Council
GSK	GlaxoSmithKline
IDRC	International Development Research Centre, Canada
IICP	Industrial Innovation Centres Programme (KACST)
IT	Information technology
JPND	Neurodegenerative Diseases Research (EU)
KACST	King Abdulaziz City for Science and Technology, Saudi Arabia
M&E	Monitoring and evaluation
NGO	Non-governmental organization
NRF	National Research Foundation, South Africa
OECD	Organisation for Economic Cooperation and Development
PPOP (CONCYTEC)	Special Program of Popularization of Science, Technology and Innovation
R&D	Research and experimental development
r4d	Swiss Programme for Research on Global Issues for Development (SNSF)
SIPER	Science and Innovation Policy Evaluation Repository
SMEs	Small and medium enterprises
SNSF	Swiss National Science Foundation, Switzerland
STI	Science, technology and innovation
THRIP	Technology and Human Resources for Industry Programme (NRF)
UN	United Nations

Introduction

Executive summary

What are partnered research programmes?
The term partnered research programmes (PRPs) is an encompassing framework for diverse funding opportunities supporting more than one constituency and often sourced by more than one research funder.

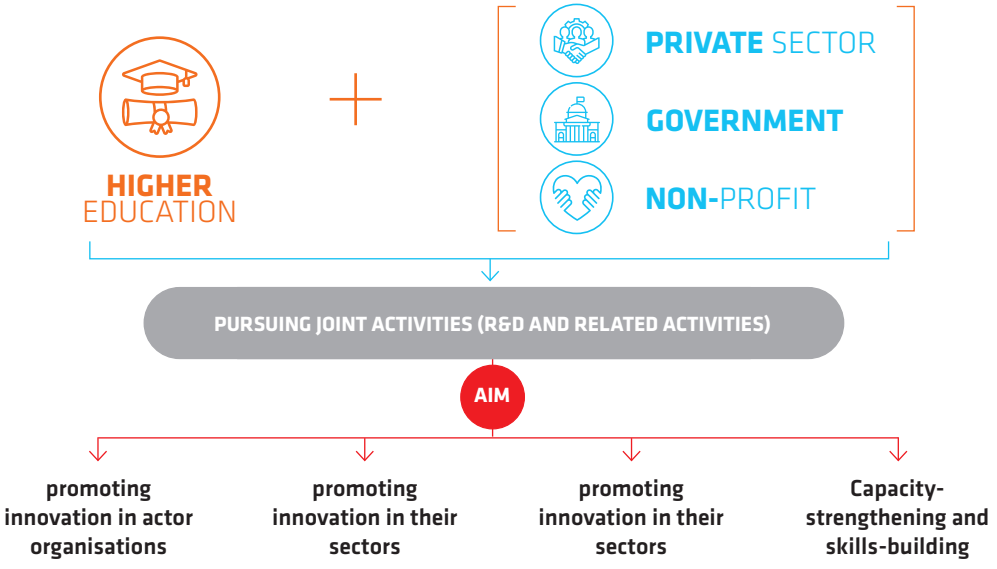
In most instances, PRPs are funding opportunities designed to promote collaboration between academic (e.g. higher education, public research organisations) and non-academic actors (e.g. private, government, non-profits). They involve research and experimental development (R&D), training or knowledge exchange activities to strengthen capacities or advancing public or private goods in a range of fields (e.g. economic development, social policy, healthcare or environmental sustainability).

'In partnered research programmes, multiple priorities and strategic objectives are typically at play.'

Why this guide?
Over the decades, funding agencies across the world have launched increasing numbers of partnered research initiatives. These programmes have become more diverse and on demand.

This guide promotes good practice in designing, monitoring and evaluating this type of funding scheme.

Figure 1: Actor constellations in PRP for pursuing joint activities



1. See OECD 2015, ch. 2.1-2.7, 2.8.

a Introduction

How to use this guide

The guide is structured into three interlinked sections that create an integrated approach:

1. Design
2. Monitoring
3. Evaluation

These three components are closely interlinked. They are brought together in this guide to promote an integrated approach.

A summary of each section is presented below.

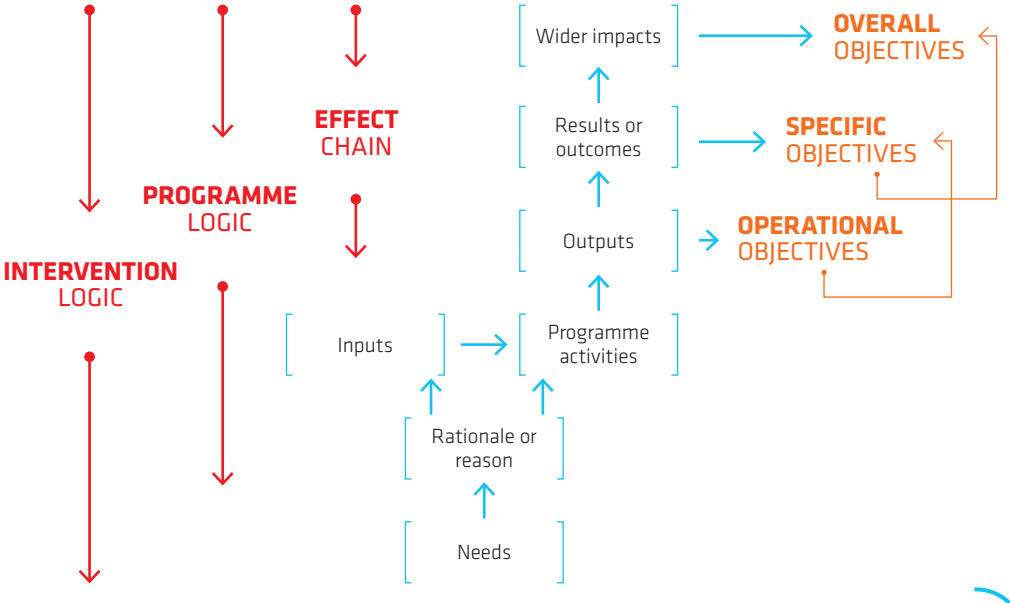
Designing a PRP

Considering their strategic intent, it is crucial to define the aims and outcomes of a PRP and ensure that these are complementary among partners. This may require additional attention if multiple funders are involved.

'Partnered research programs tend to have unique assessment criteria that stand apart from either academic research programs or innovation programmes led by non-academic actors.'

While PRPs support collaboration, visualising the programme logic from academic and non-academic perspectives helps programme designers identify and formulate how the collaboration can bring the greatest benefit and where priorities and interests of different actors may diverge. A good understanding of the intervention logic at the programme design stage, elaborating the aims and activities, and the programme logic from the perspective of academic and non-academic partners helps inform future monitoring and evaluation decisions.

Figure 2: Intervention logic



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The guide discusses additional factors to be considered when designing PRPs:

- Engaging partners when identifying priorities;
- Supporting sustainability or scaling innovations;
- Attracting the right applicants;
- Ensuring the correct grant size;
- Ensuring the right applicants receive funding.

'Monitoring data should be constructed to connect components of the logic model to answer priority questions.'

Monitoring a PRP

As both academic and non-academic dimensions have to be considered, monitoring tends to be more complex than for standard research funding programmes.

Key is making the link between defining aims and expectations, and monitoring outcomes and impacts. If programme aims and expectations are clearly defined, excessive monitoring can be avoided by selecting structured monitoring indicators.

General aims need to be understood in ways that can define what a successful programme or project looks like. This can be done at two levels:

- In measurable terms, what would a successful programme look like? What change should be observable between the programme start and end?
- What do funded project teams need to achieve so that their contributions can be integrated with others to make an overall assessment of the programme?

The performance indicators of PRPs are broad, from input (administrative data) and activities, to outputs, outcomes and impacts.

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Figure 3: Variety of performance indicators

OUTPUT

R&D

- *Academic publications/ communications*
- *Creative works/performances*
- *Prototypes developed*
- *Methodological advances*

Education

- *New course content/improved curricula*
- *Professional development*

Training

- *Student exposure to new research environments/methodologies*
- *Graduate degrees completed*

Goods

- *Technologies developed, tested*
- *Intellectual property developed (patents)*

Services

- *New/revised programs*
- *New/revised policy*

Processes

- *New organisational practice*
- *Production process*
- *Consultation and community consensus/ engagement*

Capabilities

- *Staff/management training, professional development*
- *Expanded/valued organisational linkages*
- *Ability to design, develop and adopt technological tools and data resources,*
- *Knowledge products: technical publications, policy reports, public service campaigns*
- *Behavioural change*

OUTCOME/ IMPACT BY SECTOR

Higher Education Academic

- *New research directions*
- *Access new research infrastructure*
- *Citation impact*

Financial

- *New/diversified research funding streams*
- *IP income*

Reputational

- *Awards, prizes, rankings*
- *Contribution to university mission*
- *Employer demand for graduate students*

Private Sector

- *Sales, profits, diversification, market share*
- *Jobs creation*
- *Spin-out/start-up companies*
- *Private investment secured*
- *Market development*

Government/ Non-profit sector

- *Relevant, accessible, effective services*
- *Contribution to public policy goals, e.g. sector growth, improvement on sustainable development goals, economic growth*

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In addition to quantitative indicators, qualitative reporting should be used, especially when quantifiable indicators are not able to fully capture the relevance or significance of outcomes.

Several qualitative monitoring practices are common in the form of programme support and facilitation activities, depending on programme design. They include reaching out to non-academic communities and potential applicants, hosting inception meetings and/or organising webinars, supporting project team monitoring and evaluation efforts, providing feedback on technical or mid-term reports, organising project site visits, and developing or supporting a common platform for sharing data, emerging results and novel applications.

The guide provides further insights into PRP monitoring on these topics:

- Selecting indicators that reflect the activities and intended results of all partners;
- Collecting administrative data that accounts for non-academic partners;
- Ensuring project reporting is straightforward and understood by all;
- Facilitation and keeping projects on track;
- Ensuring proper use and distribution of funds;
- Extending the monitoring timeframe of a programme.

'As a principle, good programme monitoring supports robust evaluations.'

Evaluating a PRP

When a PRP is designed with an intervention logic translated into the programme logic and effect chain, the following key evaluation questions part of the game from the outset:

- Is the programme relevant to the needs it seeks to address? Does the programme attract the right applicants and fund the right projects?
- Is the programme efficient? Do inputs (effort and money spent) translate into outputs at the expected rate?
- Do the outcomes observed relate to the expectations of each funded award?
- Is the programme impactful and, therefore, sustainable? Are the impacts of a suitable scale and do they address the problems the programme originally sought to address?

For PRPs, the following issues tend to make evaluations more complex than for either a purely research-focused or a purely business-support-focused programme:

- PRPs typically have academic and non-academic aims and objectives, which makes the intervention logic more complex.
- The extent to which academic and non-academic objectives are mutually enforcing or create tensions warrants investigation.
- The partnership itself is significant. Important evaluation questions for PRPs include: Is the programme mutually rewarding, have partners gained a new appreciation of when and how partnerships advance their goals, and has

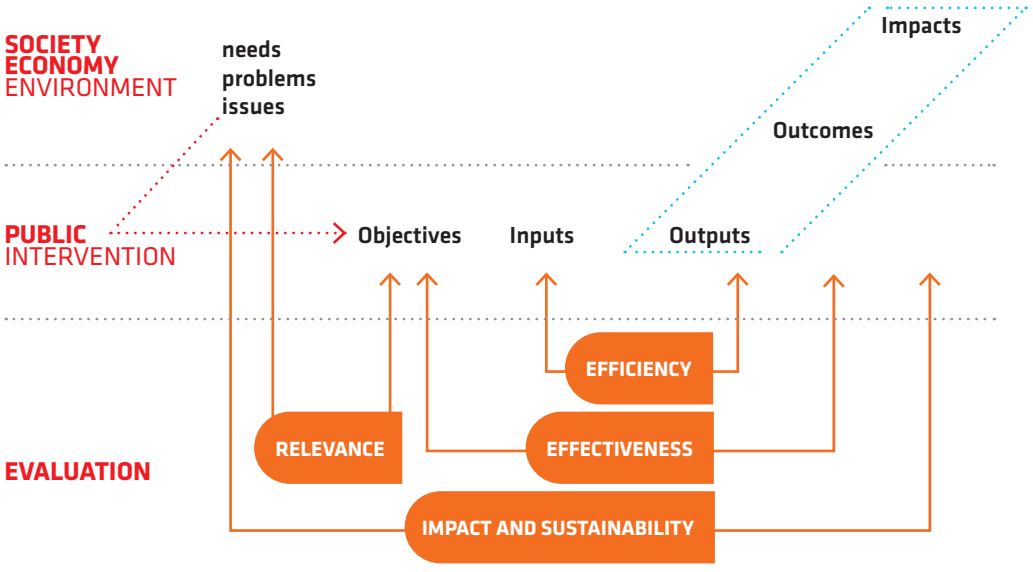
Introduction

the programme created conditions for ongoing collaboration?

- Intended outcomes and impacts of PRPs often go beyond the readily quantifiable. This includes the aforementioned mutuality and longevity of the partnership, and extends to its influence on organisation practice and policy, and on broad domains (e.g. grand challenges) where a change in state may be difficult to reduce to quantitative measures.
- Programmes supported by multiple funders bring together agencies with different mandates and, therefore, might require that different strategic priorities be addressed. The priorities of the funders must be advanced by the programme and the evaluation.

Key evaluation dimensions are shown in figure 4.

Figure 4: Dimensions of an evaluation



Source: Adapted from European Commission 1999.

a Introduction

The guide provides in-depth guidance into programme evaluation. Finally, the decision on what methods to be used should consider several factors, including evaluation requirements (if applicable), evaluation purpose and timing of the evaluation, programme design and aims, and effort involved and resources available. Evaluation methods are constantly evolving. Big data and web analytics may yield further fruitful approaches, and entirely new methodologies may emerge.

Funders and evaluators alike will benefit from new methodology trends and possibilities, particularly for more complex programmes such as PRPs.

It is good practice to publicise final evaluation reports for transparency to ensure that evaluations contribute to the international evidence base. Thanks for sharing!

Stay in touch

With the publication of this guide, the Global Research Council (GRC) Working Group on Partnered Research Programmes achieved one of its objectives. Click here to stay in touch: https://www.globalresearchcouncil.org/contact/

Introduction

Foreword

The contribution of PRPs to driving research impact and uptake of knowledge, innovation and skills development is well recognised by those involved and funding them. While some funding agencies have well-developed PRPs and experience to draw from, funding agencies have shown increasing interest in sharing lessons and experiences on design, implementation and measurement of such programmes, and in promoting peer learning among funders.

This guide results from GRC meetings held during 2016 and 2017, at which funding agencies examined their roles in promoting the interplay between research and innovation, and how the GRC network could promote capacity-strengthening programmes. The meetings profiled a number of PRPs globally and the conversations revealed a strong interest in understanding how agencies promote collaboration between academic and non-academic partners and to what effect.

To advance this conversation, Canada's International Development Research Centre (IDRC) and South Africa's National Research Foundation (NRF) convened a roundtable in June 2017, which revealed the need for increased information sharing among agencies on design, monitoring and evaluation of PRPs, using that knowledge to refine and/or harmonise monitoring, evaluation and learning frameworks. A working group was formed that assessed 21 PRPs and practices from 10 agencies. The results were presented at workshops during the 2019 and 2020 GRC meetings.

This guide is informed by funder experiences and insights, research and consultations. The lessons from this exercise have direct practical application for GRC work, including the recent focus on 'mission-oriented research'. The lessons and approaches shared in this guide will be particularly useful to funders developing PRPs and may provoke GRC participating agencies to continue sharing successes and challenges when developing and implementing programmes.

We are delighted to share our findings that bring to life GRC principles. We are indebted to the GRC Governing Board for the opportunity and support to make this guide a reality. We trust that the guide will enable funding agencies to make well-informed choices, based on shared learning, when designing, monitoring and evaluating PRPs.

GRC Partnered Research Programme Working Group (2021)

Introduction

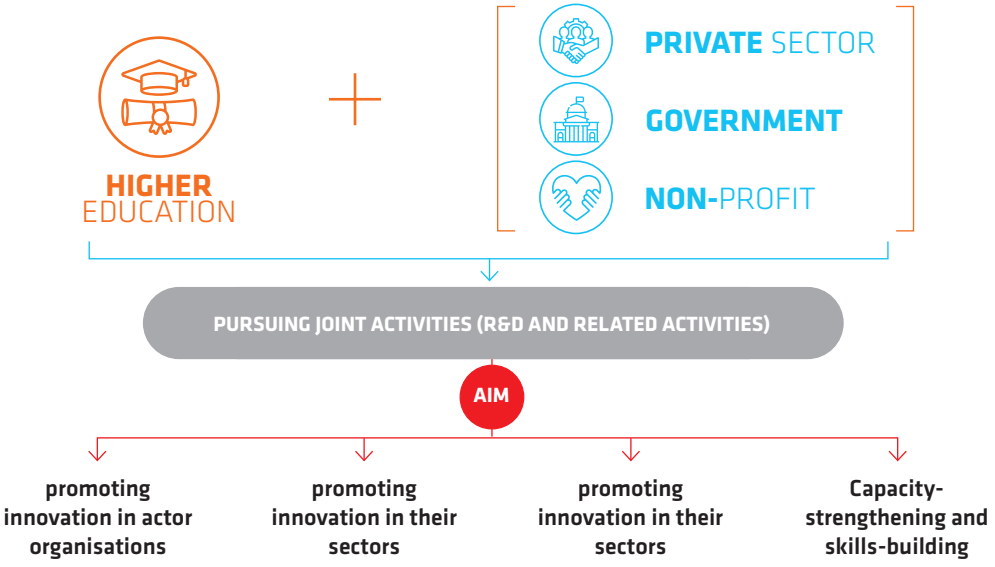
1.3.

Partnered research programmes – science with, in and for society

PRPs are funding opportunities to promote collaboration among academic (e.g. higher education (public, private), public research organisations) and non-academic actors (e.g. private, government, non-profits) that involve research and experimental development (R&D), training or knowledge exchange to strengthen capacity or advance the public or private goods in various fields (e.g. economic development, social policy, healthcare and environmental sustainability). R&D supported by PRPs include basic research, applied research and/or experimental development defined by the Frascati Manual, and complementary activities that do not meet the manual's formal definitions.[1]

The term partnered research programmes provides a framework for the diversity of funding opportunities supported by research funders. There are various labels for this kind of research programme, but they tend to have disciplinary associations. Engineering and natural science fields often refer to collaborative R&D or university-industry programmes. The health sciences speak of patient-engaged, translational and implementation research programmes. The social sciences and humanities are familiar with community-based, action-research schemes and community-university alliances. From a programme design perspective, there are many similarities to these differently labelled approaches to research collaboration. Rather than adopt one term over another, this guide uses partnered research programmes.

Figure 5: Partnerships, activities and aims



1. See OECD 2015, ch. 2.1-2.7, 2.8.

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A growing number of research funders support PRPs to advance their mandate. Among GRC participating agencies, rationales vary for incorporating PRPs into their funding portfolios as does the depth of their experience. For agencies with mandates to advance academic-led research, such programmes emerged from an interest to diversify the conduct of research and respond to fields of research that stood to benefit from collaborating with non-academic partners. GRC participants with mandates to support research within and innovation beyond academia use PRPs as a system-level approach to knowledge generation and societal application. Finally, as the GRC's consultation on mission-oriented research underscored, governments also look to public funding agencies to support national public policy goals. Mission-oriented research schemes share the goal-oriented approach of PRPs but not necessarily the expectation for collaborating with non-academic actors.[2]

The evolving nature of PRPs

Over the decades, research funders across the world have launched increasing numbers of partnered research initiatives. Programmes supporting university-private sector collaboration are perhaps the most readily identifiable model, but support has been longstanding for collaboration between life sciences and healthcare and between social sciences and humanities with government and the non-profit sectors. More recently, the attention paid to grand challenges and the United Nations Millennium Development Goals and then the Sustainable Development Goals has resulted in socio-economic challenge-based funding programmes promoting multisectoral collaboration.

PRPs have become more diverse. The following table presents a perspective from a 2017 workshop on how partnered research has evolved.

2. See, GRC 2021.

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Table 1: Evolving PRPs

Domain	The beginning	The evolution
Focus	R&D focus - disciplinary	Problem focus - interdisciplinary
Relationships	Direct counterpart (e.g. health sciences linked to research hospitals; engineers linked to private sector firms)	Multilevel partnerships (supporting ecosystems of innovation rather than individual entities, e.g. companies, hospitals)
Benefit flows	Linear: From universities to firms	Multidirectional: Benefits are mutual - they accrue to academic and non-academic partners
Impact domains	Formal economy	Also: Informal economy Public sector innovation Public goods (environmental sustainability)

Source: IDRC and NRF 2017

This evolving context and broad inclusion of non-academic partners introduce challenges and opportunities for research funders. Appreciating the interests of non-academic partners is an important design consideration and supporting expected patterns of collaboration between academic and non-academic partners may place unexpected demands on funders. Academic partners may also be unfamiliar with the challenges and opportunities of partnered research schemes and communicating clearly with them may require additional effort. Such considerations and challenges were raised in GRC meetings and by Working Group members.

Working Group representatives also highlighted the opportunities to be advanced through such programmes. One agency commented that its PRP enabled it to build a vocal constituency for publicly funded science beyond the academic community. Not only did the private sector augment public funding, but industry representatives became involved in its merit review committees and in public outreach efforts. Others mentioned that their programs allowed them to work across government to support national strategies and showcase the diverse ways research funding can support public policy goals.

Demand, growth and investment in PRPs have attracted academic interest and many funders have evaluated their programmes. Understanding the programmes' impact has been a common objective, but research and evaluation evidence is geographically concentrated where PRPs are more established. Even in the relatively well-examined field of technology transfer from universities to industry, evidence and practice gaps exist.[3]

3. On technology transfer challenges see, OECD 2016. For a broader discussion of research and practice gaps, see Perkmann et al. 2013 and 2021.

a Introduction

These gaps were background considerations for the Working Group. The primary motivation was to exchange insights and identify opportunities for promoting good practice in designing, monitoring and evaluating these funding schemes.

Intention and intended use

This guide grew from a shared agency interest to exchange perspectives and organisational practices on how agencies support partnered research and what they have learnt. The guide's intention is to identify decision points for funders and options for designing new or managing existing programmes. The working group examined more than 20 programmes and others were detailed in GRC meetings. This guide shares this diversity in a simplified presentation.

The composition of the Working Group indicates who may find the guide useful. Contributors included programme staff developing research programmes and project selection processes; staff monitoring implementation and interacting with academic and non-academic partners, and evaluation staff. Agency staff responsible for information management and supportive technology, partnership development and external relations will also see their contributions reflected in the guide.

The Working Group and meeting participants share common practices and missions, although differences exist among the agencies and their institutional settings. The GRC is a forum for funding agencies with different mandates. Some GRC members focus on academic research while others support broader R&D activities involving public and private research organisations. An important implication for the reader is how this organisational diversity frames questions of interest and experience. An agency that has worked principally with academic organisations would have different organisational processes and references than an agency that has worked with higher education and private sector organisations.

The guide reflects different vantage points of GRC participating agencies, although for brevity the examples, decision points and observations are not consistently presented through these vantage points.

Working Group and contributors

The Working Group provided the impetus and background material for this guide. The group was formed following an open invitation to GRC participating agencies (see Annex 1 for Working Group composition).

Three aims guided the group's work: 1) characterise programme designs and draw out lessons learnt during application and assessment; 2) identify monitoring and reporting practices to understand how agencies support implementation and assess project and programme outcomes and impact, and 3) generate guidance for planning and conducting evaluations of PRPs. Context and guidance emerging from these aims are addressed in the following three sections.

In addition to the case studies (see Box 1), the guide refers to other examples discussed in workshops or identified as emblematic programmes.

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Box 1: Programmes managed by Working Group organisations

The 20 programmes consulted for this guide vary considerably in funding, duration and award type:

- Project value: Individual projects range from approximately US$5,000 to several million, although most are between US$150,000 and $500,000
- Programme models and aims: The case study programmes differed in structure and aims. Some were large network projects involving numerous organisations, while others paired two organisations, exchanged personnel or supported the application of academic research ideas into the non-academic sector. Programmes promoted innovation in the public and private sectors, and/or strengthened R&D capacity in different sectors
- Program duration: Most programmes supported multiyear collaborations, but a few were shorter-term collaborations
- Maturity: Most programmes were under five years old, but some were longstanding, multiphase programmes
- Location: Programmes were drawn from all GRC regions, except Asia, and most were national, with a couple supporting international collaboration.

Programme case studies were compiled and analysed with the Technopolis group, which also drafted discussion papers on programme design, monitoring and evaluation. These reports were reviewed and revised by the Working Group, and during a GRC workshop in Sao Paulo and GRC regional meetings between October 2019 and January 2021. These contributions are reflected in the guide.

The Working Group was interested in Technopolis's guidance because, as evaluator of a range of research funding schemes and being familiar with the missions of research funding agencies, it offered a complementary perspective from a different vantage point.

b

Programme design

2.0.

Introduction

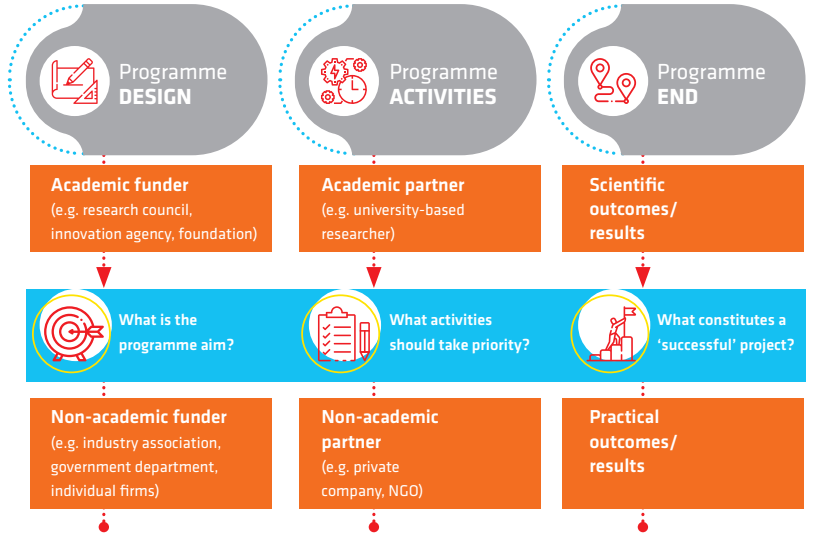
This section provides guidance and context on issues from programme conceptualisation to proposal assessment and funding.

Aligning interests: Funders and collaborating partners

The central design challenge of PRPs is to pursue and reinforce at least two sets of interests and objectives. On one hand, academic partners have scientific/ academic aims often focused on research, developing knowledge products, training and scholarly communication. On the other, non-academic partners have needs and missions that connect to goods or services they provide, constituencies they support, or policies they develop or analyse. In addition, multiple funding partners may be involved, and their individual mandates may influence not only the governance of the programme but its design.

Academic and non-academic interests need to be integrated at three points (see Figure 6): Firstly, at the programme development stage, especially when there are two (or more) funders with different strategic priorities; secondly, when project partners implement an integrated workplan and, thirdly, at the end, when views may differ on what constitutes a 'successful' programme (and how to measure/ monitor intended and unintended results).

Figure 6: Academic and non-academic priorities



Source: Technopolis

Programme design

Programme designers need to answer three questions: What is the programme's aim(s), what activities and pooled resources can advance the stated aim(s) and what constitutes a successful project? The answers will dictate programme facilitation, monitoring and evaluation activities needed.

2.1. Programme aims and activities

The programmes consulted for this guide seek to spur innovation in the private and the non-profit sectors, and build the capabilities of people and organisations to address shared challenges. Figure 7 situates these aims, the focus of such programs and associated activities.

Figure 7: Broad aims of PRPs

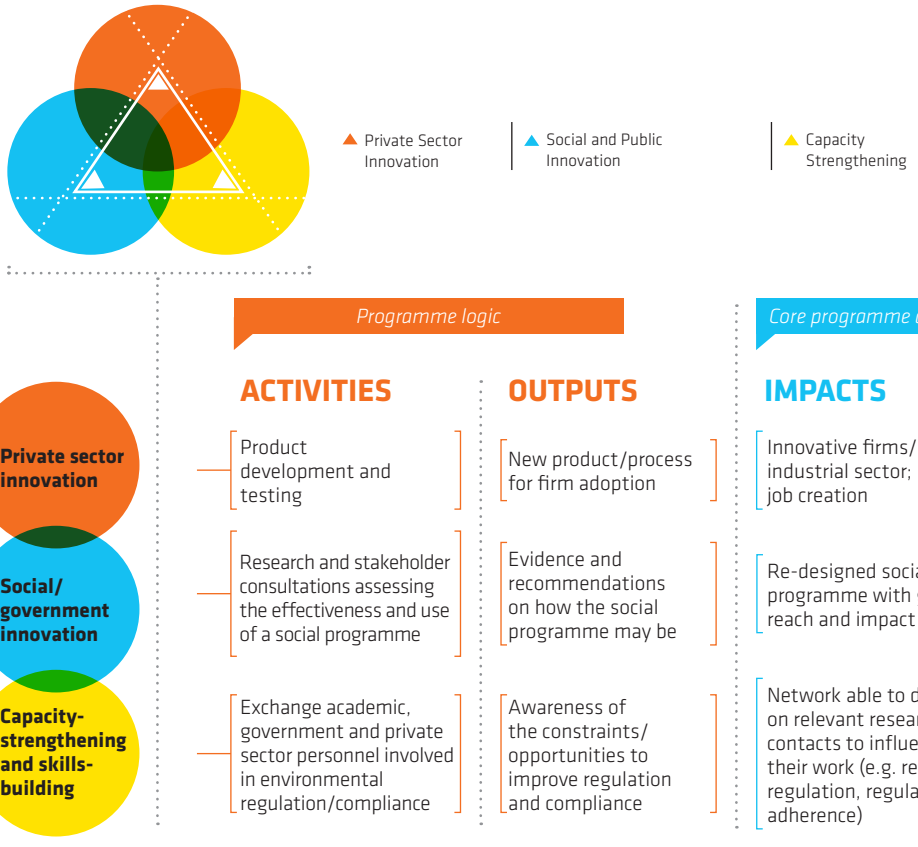
b

Programme design

Several programmes considered here combine these aims. A common combination is capacity strengthening and skills building with one of the other two aims.

Regardless of the number of aims, it is important to differentiate between the aims and the means of reaching them. For example, a programme that addresses an environmental challenge may support technology transfer or training, which would be the means to achieve the goal. Alternatively, a programme may involve environmental technologies, but the aim may be to close knowledge and practice gaps in the sector to enable more effective coordination or collaboration among academic and non-academic institutions. Logic models distinguish among 'activities', 'outputs' and 'impacts', the last mentioned being most clearly tied to programme objectives. This is illustrated in Figure 8.

Figure 8: Illustrating programme aims and programme means



b

Programme design

Programmes considered in the development of this guide are structured differently. Table 2 identifies two temporal dimensions and how projects are positioned for use.

These three attributes that influence partnership dynamics are:

- **Agenda setting:** Do partners have equal input in agenda setting? Are proposals co-designed with stated contributions by partners or does one partner have greater influence and responsibility - greater input by non-academic partners (demand-driven) or academic partners (supply-driven)?
- **Implementation:** Are projects co-implemented with ongoing technical/ advisory input of both partners or does programme design envision a lead implementation partner?
- **Positioning for use:** Are projects designed with a specific user in mind or could the project outcomes (general) benefit many users?

The first column assigns a descriptive model. Four models are identified: joint team, exchange, ideas to application and networks.

Table 2: Models and programme characteristics identified from sample

Models	Agenda-setting	Implementation	Positioning for Use	Program example (Details of the programs will be listed here are captured in text box below)
Joint team	Co-design	Co-implementation	Specific	• NRF: Technology and Human Resources for Industry Programme (THRIP)* • FAPESP: Research Partnership for Technological Innovation • CNRST: Research and Technological Development in Priority Areas (Type C) • ANII: Alliances for Innovation • KACST: Industrial Development Program
Exchange	Demand-driven	Partner-led	Specific	• CONICET: Network oriented to problem solving (RIOSP) • CONCYTEC: Special Program of Popularization of Science, Technology and Innovation*

Programme design

Models	Agenda-setting	Implementation	Positioning for Use	Program example (Details of the programs will be listed here are captured in text box below)
Ideas to application	Supply-drive	Academic-led	Specific	• SNSF: Bridge Program* • ANII & CONACYT: Programmes with GSK*
Networks	Demand driven	Co-Implementation	General and specific	• KACST: Industrial Innovation Centers Programme
	Co-design	Co-Implementation	General and specific	• EC: Joint Programme Initiatives* • ANII: Technology Sector Networks • IDRC: Canadian International Food Security Research Fund IDRC/ SSHRC/NSERC/CIHR: International Research Initiative on Adaptation to Climate Change
	Co-design	Academic-led	General and specific	• SNSF: Swiss Programme for Research on Global Issues for Development (r4d)*

(*) indicates a co-sponsored program - a collaboration between a research council and a private sector organization or a government agency.

The four models can be distinguished as follows:

Joint team: Programmes that invite joint proposals from non-academic and academic partners, who work together to address an opportunity or challenge identified by the non-academic partner. Secondary outcomes may accrue to the academic partners and others involved. All programmes reviewed involved collaboration with private sector companies.

Exchange: Programmes invite non-academic partners to define the agenda. Academics and/or graduate students with relevant expertise join a project or are seconded to a non-academic organisation. In the reviewed programmes, collaborative activities were episodic or short-term activities.

Ideas to application: Programmes invite academics to submit proposals, with the requirement or expectation that non-academic partners will support the project in some way. Projects are led by academics who transfer knowledge (social innovation) or commercialise research (private sector innovation). Projects have a specific use application. Non-academic partners provide advisory or technical support and/or take research outputs to scale.

Programme design

Networks: These programmes support numerous organisations across different sectors. Several programmes here involve non-academic partners from the private or productive sector and from the government and the non-profit sector. Diverse multisectoral engagement is a unique feature of the network model. In the programmes reviewed, there is not a single pattern to agenda setting or implementation. In addition, programmes identify specific beneficiaries but often have general aims. General positioning for use may involve strengthening capacities/skills, support an economic or social sector or build a platform for collaboration.

Table 3: Examples of PRP models

	Agenda setting	Implementation	Positioning for use
Joint team			
NRF: Technology and Human Resources for Industry Programme (THRIP)	Minimum of one research institution and one industrial partner. Proposals are jointly submitted. The industrial partner must provide matching funds	Problem definition and project implementation involve collaboration between academic and industry partners	The industry partner is the intended beneficiary. New products or processes support industry competitiveness. New skills and expanded contacts benefit young researchers
Network			
KACST - Industrial Innovation Centres Programme (IICP)	Programme invites proposals from multiple industrial partners in national priority sectors	Problem definition and project implementation involve collaboration among industrial partners, research institutions and KACST	Innovation Centres promote technological solutions and intensify research, development and innovation in targeted industrial sectors. The programme promotes collaboration between researchers and industry, creates technological jobs, and stimulates start-ups.

b

Programme design

	Agenda setting	Implementation	Positioning for use
Exchange			
CONCYTEC: Special Program of Popularization of Science, Technology and Innovation (PPOP)	Programme invites proposals from multiple sectors and may include higher, secondary, primary education organisations, government agencies, museums, non-profit and private organisations	Proposals may be led by academic or non-academic partners. Supported activities may include research and/or knowledge dissemination	Activities create public awareness and training (all levels of education and professional development) on topics and in fields to raise interest in and understanding of STI. Focus may be organisational or thematic
Ideas to application			
SNSF: Bridge Program	Programme invites researchers to submit proposals to transition products from pre-commercial research to market	Proposals are led by researchers. Non-academic collaborators are invited to support R&D, and provide advisory or technical support	Projects seek to create spin-off companies or license technology to established firms

Programme logic modelling

Funders have different experiences working with logic models. Logic models assist programme designers to understand programme goals, what the funder invests in a programme, the activities supported and intended results. Logic models are used extensively by the evaluation profession. For programmes that will be evaluated, they should be developed at the outset.

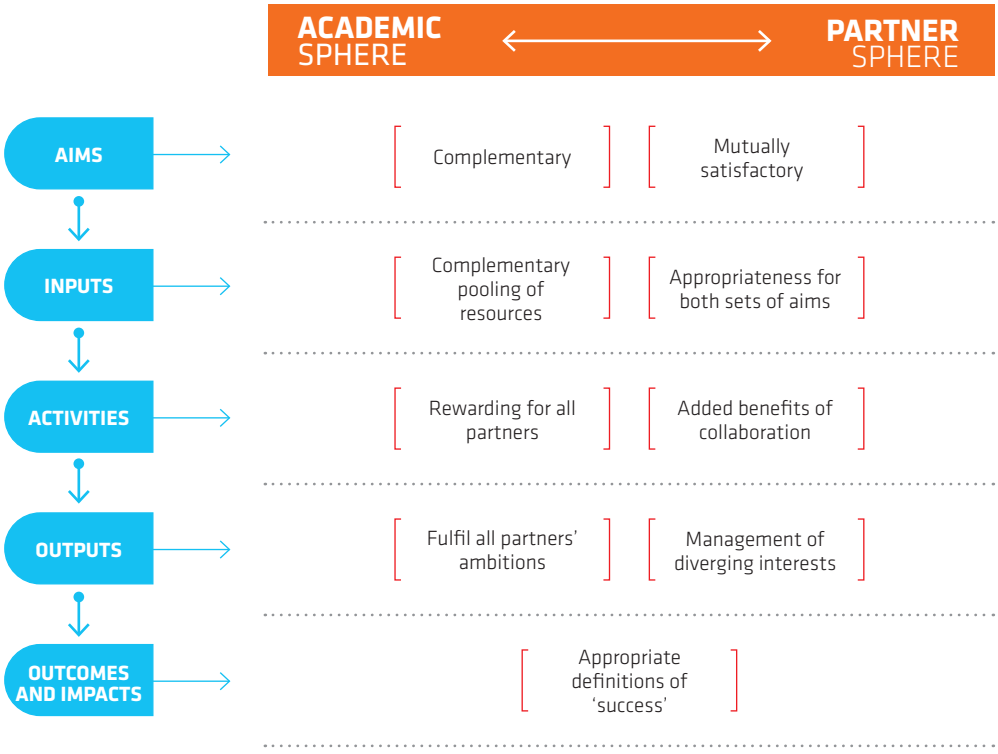
They are particularly useful for PRPs, given the multiple priorities and strategic objectives typically at play.

While programmes support collaboration, visualising the program logic from academic and non-academic perspectives may help programme designers identify and formulate how the collaboration can bring the greatest benefit and where priorities and interests of different actors may diverge.

Figure 9 presents design considerations and decision points from different vantage points.

Programme design

Figure 9: Combined programme logic - key areas for negotiation



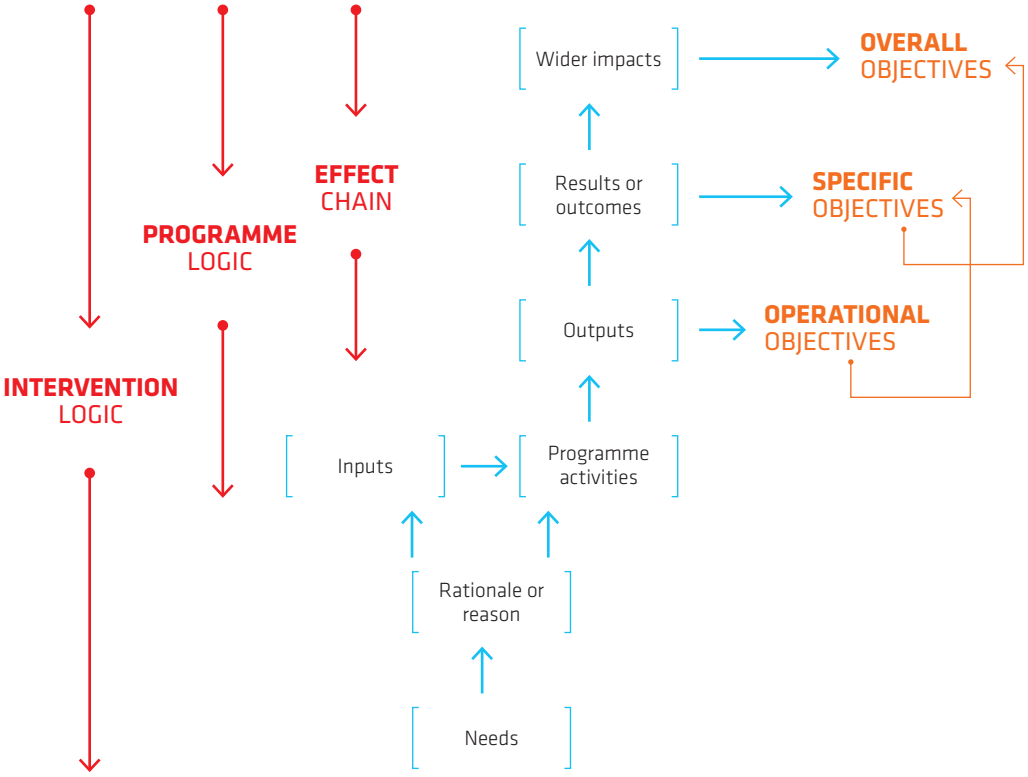
Source: Technopolis

This point also applies to programmes funded by two or more funding agencies. Understanding the funders' contributions, priorities and objectives can help crystallise programme governance and design, identifying areas needing attention. Input from academic and non-academic partners may provide insight on what design features would support constructive collaboration.

The expected results chain from the perspectives of funders, academic and non-academic partners can then inform the intervention logic. Figure 9 expands on programme logic that situates the design of the programme in the context of its rationale and needs (intervention logic) and expected benefit flows (effect chain).

Programme design

Figure 10: Intervention and programme logic



Source: Technopolis

At the design stage, elaborating the aims and activities, and the programme logic from the perspective of academic and non-academic partners should inform monitoring and evaluation decisions.

Programme design

2.4.

Programme demand

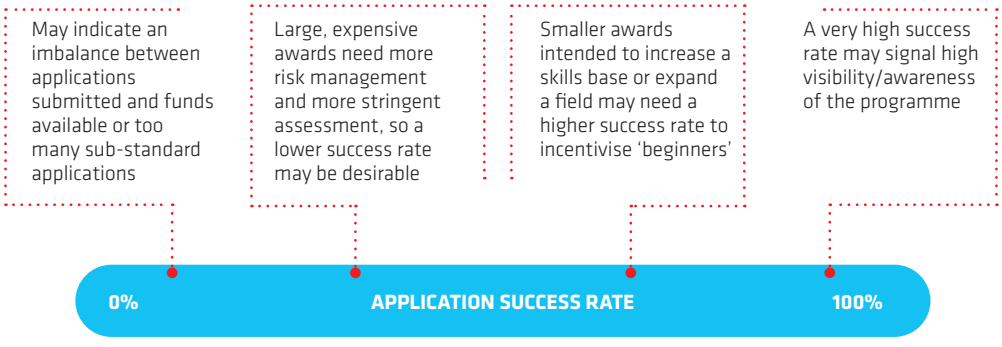
All funders aim to solicit quality proposals and an application success rate that responds to applicant expectations and programme aims. A programme's application success rate is calculated by dividing the number of awards granted by the number of applications received. For programmes with periodic calls, the success rate can provide useful information for applicants (likelihood of funding) and programme managers (need to increase/reduce application numbers or increase/reduce funding) to advance goals.

The success rates for programmes considered by the Working Group range from under 5% to over 90%, with most around the 20% to 30% mark. This is not an 'optimum' rate, as there can be good reasons to promote either a higher or a lower success rate.

A low success rate can be problematic for non-academic applicants, who may not be familiar with the competitive selection processes used by research funders. They may be concerned with the time investment in an application process if the likelihood of funding is low. This is a particular concern for programmes that seek to widen and deepen interaction between academic and non-academic partners who do not typically collaborate. If the application process is a deterrent for non-academic partners, it may undermine a programme aim. Conversely, a low success rate may suggest to a funder that the programme is funding high-potential applications and provides reassurance that public funds are being used appropriately.

A high success rate may be the intended result. For some demand-led schemes for which the non-academic partner contributes funds and the funding agency commits matching funds enabling academic participation, application success rates may be very high. When a high success rate is not the intended outcome, funders may need to stimulate more applications or decrease funding. Figure 10 identifies these and other considerations.

Figure 11: Application success rates



If uptake from the non-academic sector is a concern, funders have found it helpful to extend application timelines, advertise programmes outside academic channels and organise information sessions.

Getting the grant size right

Project budgets varied considerably in the case studies, ranging from US$5,000 to several million per project. This variation is to be expected. The nature and cost of R&D activities, likely duration required to achieve outcomes, matching funding from academic and non-academic partners, and training envisioned are some of the key determinants of project budgets. Funders may also consider the team size given the scale of effort identified.[4]

New programmes may realise that there is a need to adjust grant size or better use available funds through programme modifications (Box 2). Planned supplemental or conditional funding is also used. Such opportunities to broaden or deepen partnerships and/or accelerate application increase grant size. For example, Science Foundation Ireland supports partnered research through its Research Centres programme. Through the Spokes Programme, Research Centres can apply for additional funding for new industrial and academic partners to join their centres to advance a particular goal.[5]

Programme demand and reactions by funders in the Swiss Programme for Research on Global Issues for Development (r4d programme)[6]

The 10-year r4d programme offers five thematic calls and three thematically open calls sequenced between 2013 and 2016 for differently sized projects.[7] This network model programme supported international research partnerships among Switzerland and low- and middle-income countries. Projects were assessed for scientific quality and development relevance with equal weight.

During the initial phase, the programme created limited demand in the research community, the success rates were low and budget allocations were not fully used at first. The r4d programme steering committee, composed of representatives from the Swiss Agency for Development and Cooperation and the Swiss National Science Foundation, reacted to this by launching an additional thematic call with four foci in 2016, sourced by the left-over funds of the previous thematic calls. In addition, in 2019 the funders launched an internal call for Transformation Accelerating Grants for completed or ongoing r4d projects that intended to test or valorise some research results in so-called Transformation Accelerating initiatives with implementation partners from the private sector, government or civil society.

With these adaptations, the r4d programme responded to and increased demand from the research community. Application numbers grew steadily and the success rates for teams invited to submit full proposals gradually increased.

4. How project size and composition influence outcomes have received academic attention. For a recent study, notable for its size, see Wu, Wang and Evans 2019.
5. For programme details, see https://www.sfi.ie/funding/funding-calls/sfi-research-centres-spokes/index.xml.
6. Programme description available at https://www.r4d.ch.
7. Different award sizes within a programme are not a common feature of the programme case studies but are an option for funders to consider. PRPs can also be situated in the broader research funding landscape. In countries with several research funders offering different programmes, a PRP may be positioned to complement other funding opportunities.

Another approach that will influence grant size is the 'funding ladder', where programmes have small (seed funding) grants to test an idea or develop a partnership. Teams may then be eligible to apply for larger grants. As some programmes support commercial applications, signalling where public funding should end and where the market should take over is an additional consideration with funding implications. Where relevant, programme designers should define programme aims in such a way that market transition is a critical characteristic of a 'successful' project.

2.6. Assessment criteria and process

PRPs tend to have unique assessment criteria that stand apart from either academic research programmes or innovation programmes led by non-academic actors.[8] When designing PRP assessment criteria, funders with innovation missions may need to introduce criteria relevant for academic partners, whereas funders with basic research missions may need to emphasise criteria relevant for non-academic partners.[9]

Table 4 lists the criteria for a research programme and a PRP managed by ANII, Uruguay and FAPESP, Brazil. The ANII examples highlight an academic programme for applied research and a PRP for basic research sponsored by GlaxoSmithKline (GSK), a pharmaceutical company. Both ANII programmes have roughly similar assessment criteria but the process is different. Both ANII programmes are assessed for relevance to the aims of the programme. For the María Viñas programme, relevance is considered alongside other criteria but for the ANII-GSK programme, there is a two-stage process. With the input of GSK, the first stage establishes relevance. Only relevant proposals are then assessed for quality in the second stage.

The FAPESP examples illustrate the additional evaluation criteria introduced to assess the participation of non-academic partners in the Research Partnership for

8. The working group limited itself to understanding the evaluation criteria of different programmes and how they were assessed. This guide does not provide advice on the structure of proposals and communicating with applicants. The monitoring and evaluation sections comment on project-level information needed to support these functions, and these considerations can inform what information is requested in application forms. Funders emphasised the importance of letting applicants know who would access their proposals, what data might be stored, their reporting obligations if funded, and what support the funding agency would provide to support project implementation.
9. The GRC's dialogue on Responsible Research Assessment is relevant to establishing appropriate assessment criteria and supporting diverse research cultures. The programmes reviewed here broaden and value a broader framing of research in and for society.

Programme design

Technological Innovation Program (PITE). The assessment criteria in the far right column address the complementarity of interests and capabilities of the academic and non-academic partners. In addition, proposal relevance is addressed broadly (relevance to social and economic development) and specifically for partners involved (technology landscape, market analysis, capacity to exploit research results).

Table 4: Comparison of Evaluation Criteria

ANII (Uruguay)		FAPESP (Brazil)	
Research program	**PRP**	**Research program**	**PRP**
Applied Research: María Viñas Fund[10]	Sectoral Fund ANII-GSK[11]	Thematic Projects[12]	PITE[13]
Academic research positioned for use	Basic research collaboration with GSK	Academic research networks	Academic-industry collaboration
• Characterisation and relevance of the identified challenge • Applicability of the research plan to the identified challenge • Novelty/contribution to knowledge • Conceptual clarity and feasibility • Scientific leadership and team composition	**Stage 1: Relevance** • Basic research • Proposal alignment to programme objectives • Relevance of the topic addressed **Stage 2: Technical merit** • Scientific-technical merit • Novelty/contribution to knowledge • Technical capacity of the team • Interdisciplinary nature of the research • Ethical dimensions	• Research programme (coherence, originality, feasibility) • Principal investigator • Research team • Budget	**Similar to Thematic Projects plus:** • Analysis of company and university technical, scientific, management and financial capacity • Importance and relevance to social and economic development in São Paulo state • Market analysis • Company's infrastructure and financial contribution • Company's experience with executing projects for technological innovation and exploiting results • Skills development and transfer

10. Programme description: https://www.anii.org.uy/apoyos/investigacion/61/investigacion-aplicada-fondo-maria-vinas--modalidad-ii/.
11. Programme description: https://www.anii.org.uy/apoyos/investigacion/134/fondo-sectorial-anii--gsk/
12. Programme description: https://fapesp.br/en/thematic.
13. Programme description: https://fapesp.br/en/pite

Programme design

Both the PRPs above involve a multistage assessment process. This is another decision point for funders: Organise one merit/peer review panel to assess proposals at one time or the same or different reviewers to assess aspects of the proposal at different times.

Programmes of limited duration, scale and complexity are likely to be assessed by a single stage process. Funders may also take into consideration the number of expected proposals and the effort involved by both applicants and reviewers in assessing full proposals. If the funding opportunity is time sensitive or the review period needs shortening, a single stage assessment may be preferable.

The alternative is a multistage process. The first stage typically involves the submission of a short proposal (e.g. an 'expression of interest', EoI). Eligibility, thematic alignment or other proposal requirements may be subject to an internal and or external assessment (see Box 3). Applicants successful at this stage are invited to submit additional information, subject to one or more assessment stages. Alternatively, a single proposal is submitted and different reviewers assess different aspects of the proposal (e.g. research plan, intended results), typically sequentially.

Box 3: Staged assessment in the Bridge Program[14]

Aim: to establish, explore and implement the innovation potential of research results with the clear goal of developing an application, a service, a method or a process.

Funders: Swiss National Science Foundation and Innosuisse.

Partnership model: Ideas to application, academic-led, industrial collaboration optional.

Stage 1 – Pre-selection: The evaluation panel assesses all proposals. The panel may take into account the opinions of external experts consulted during the evaluation. The panel invites highly ranked proposals to the second stage.

Stage 2 – Final selection: Applicants present their project and innovation plans in a face-to-face meeting with the evaluation panel. The panel may ask questions. The presentation is central to the evaluation of the project proposal.

14. https://www.bridge.ch/en/.

b

Programme design

A multistage process may be advantageous in the following circumstances:

- Funders anticipate a significant response to the funding opportunity and seek to reduce effort for applicants and/or reviewers. A first stage application is typically short and applicants with eligible, relevant and promising submissions are invited to the next stage. This approach reduces the number of full proposals to be assessed.
- The programme invites applications involving numerous organisations and their contributions may need to be detailed in the proposal. A multistage process provides applicants with more time to identify suitable partners and solidify commitments. While academics are familiar with competition cycles and associated timelines, non-academic partners may not be. Negotiating in-kind or financial contributions and navigating benefit-sharing agreements etc. can take more time than for programmes that do not need or promote multisectoral collaboration. Support mechanisms such as preparatory grants or seed money may promote joint agenda setting at the application stage.

Lowering the barriers to entry with shorter EoI proposals may attract more applications to review, potentially to a burdensome level. Carefully targeted marketing and clearly stating programme aims and expectations of the programme may mitigate this. Multistage processes imply a longer timeline from launch of the call to award date, making this timeline unsuitable for time-sensitive topics (e.g. pandemic response) or, potentially, for expectations of non-academic partners.

2.7.

Expert assessment and processes

The GRC's guidelines on merit/peer review call for expert assessment to correspond to the design and aims of the funding opportunity (see Box 4). This is reflected in the different processes and expertise drawn on to assess PRPs.

The figures below illustrate how expert assessment can be structured for single- and multistage assessment processes. In most of the programmes reviewed, a blend of assessment practices is used by research funders (i.e. external reviews, academic panels) and by innovation agencies (i.e. practitioners or domain experts). The extent to which expert panels draw on expertise from academic and non-academic fields should, as the GRC principles suggest (see Box 4), be driven by the nature of the programme.

Box 4: GRC Statement of Principles on Peer/Merit Review 2018: Expert Assessment[14]

'Collectively, reviewers should have the appropriate knowledge and expertise to assess the proposal both at the level of the broad context of the research field(s) to which it contributes and with respect to the specific objectives and methodology. … Appropriate review mechanisms that are sensitive and responsive to the purpose and potential impact of interdisciplinary research should be established.'

Figures 12 to 14 highlight the assessment roles of agency staff and external reviewers and identify alternative approaches.

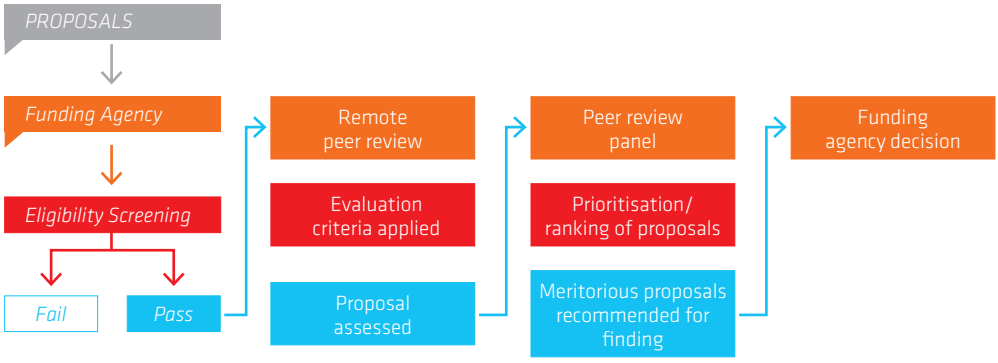
In the combined assessment model (Figure 12), a single panel may involve academic and non-academic reviewers. The funding agency conducts an eligibility review and sends all eligible proposals to reviewers, who conduct assessments independently before convening as a panel to identify meritorious proposals.

15. GRC 2018.

Programme design

Figure 12: Single- stage assessment process

COMBINED ASSESSMENT



Source: Technopolis

Figures 13 and 14 illustrate two expert multistage assessment processes. The staggered assessment models illustrates different approaches to sequencing the involvement of expert reviewers, what they review and when.

In model 1, the EoI assesses proposal relevance. Proposal relevance, team composition and alignment with programme aims can be communicated clearly even in a short proposal.[16] In the first stage, non-scientific criteria are assessed, resulting in a smaller pool of relevant proposals. Research council practices differ on who is involved at this stage. Some programmes examined involve external reviewers at this stage, whereas others involve agency staff.

Teams submitting relevant EoIs are invited to submit full proposals to be assessed for quality against the proposed research and development activities. This approach responds to some funding agencies' concerns that academic and non-academic reviewers often struggle to apply broad assessment criteria - scientific quality and originality on one hand, and relevance and potential impact on the other. Assessing different dimensions at separate stages can address this problem.

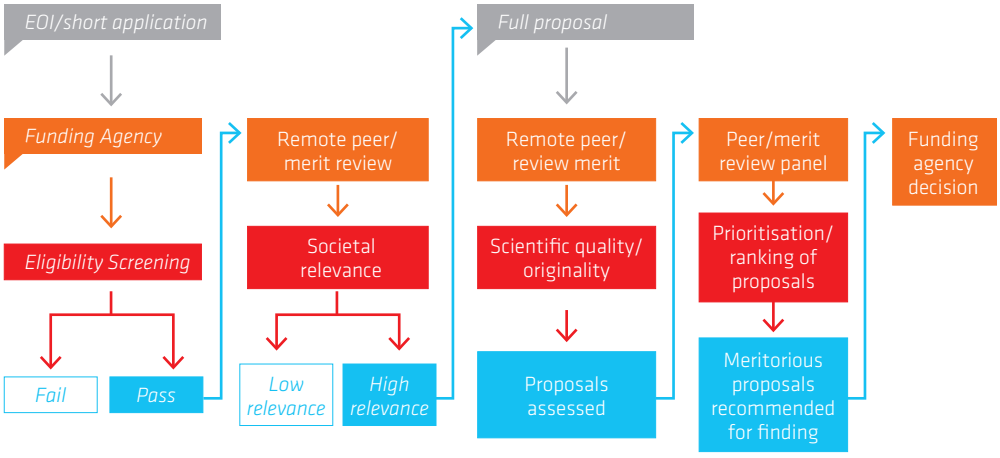
The approach outlined in model 2 staggers the assessment process in the opposite way. Expert assessment focuses on scientific quality and originality first. Then the strongest research quality proposals are assessed for relevance or potential impact, typically by non-academic experts. This results in a funding recommendation that favours high relevance or impactful proposals from a use perspective.

5. EoIs can take different formats - the short narrative document that is commonly used, or interviews or in-person presentations.

Programme design

Figure 13: Multistage assessment process - screening for relevance then quality

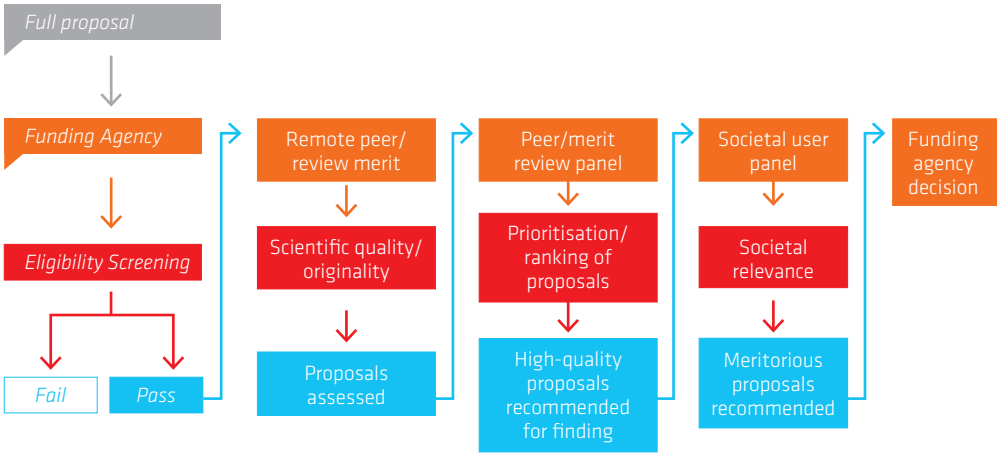
STAGGERED ASSESSMENT
(Model 1)



Source: Technopolis

Figure 14: Multistage assessment process - screening for quality then relevance

STAGGERED ASSESSMENT
(Model 2)



Source: Technopolis

Programme design

Key programme design issues

The following list summarizes the design issues introduced in this section and decision points.

Defining a 'successful' programme

- This is crucial in ensuring that the programme defines the challenge or opportunity so that it attracts the right applicants, that expectations are clear and that it is able to meet its objectives. This task starts at design and extends into monitoring and evaluation.

Defining programme aim(s) and implementation

- Partnerships are not sought for their own sake, but intended to achieve skills development, solutions to practical problems or innovation and commercial gain. Programme aims must be defined and expected outcomes must complement each other.
- The primary aims of a programme (anticipated impact) must be clarified, as must the means to achieve them (outputs/outcomes). This step has implications for monitoring and evaluation.
- Establishing the programme logic may require additional attention if multiple funders are involved. Consistent and open communication is important among operational staff.

Hearing and addressing partners' priorities

- When different stakeholders collaborate, they may have different priorities or assign different values to planned activities and expected outcomes. The potential benefits for all partners need to be clearly defined and communicated. Where there is conflict (e.g. publication vs protection of intellectual property), contractual clarification at project start and transparent dialogue are crucial.
- Those applying for funding need to know if a programme's aim connects with a public policy goal so they can situate their work appropriately.
- Make academic and non-academic partners aware what data is collected and how they will be used, and obtain their consent.

Attracting the right applicants

- In countries where academic researchers have a narrowly defined reward structure, PRPs may not attract broad interest, but the experience of some programmes demonstrates that demand can be cultivated. Likewise, attracting the right non-academic partners may be a challenge, as these constituencies may not know about the programme or because the application process is seen as a burdensome or risky investment of time and resources. Events targeting a particular sphere of interest and streamlining application and reporting procedures can be of use. Designing an application process from the viewpoint of a non-academic applicant can help stimulate interest.

Programme design

Getting the grant size right

- PRPs differ greatly in size and scope. Generally, aims and means should drive budgets and duration. Small awards are useful for exchange programmes, networking and knowledge-sharing projects. If funding allows and context merits, large investments may be particularly impactful for building scientific fields, promoting centres of excellence or tackling challenges where broad-based participation or collaboration is needed.
- Some funders offer different levels of funding within a programme, e.g. insisting on match-funding from large companies but providing full funding for small and medium enterprises.

Adjusting assessment to fit the programme

- Academic peer review processes may not be ideal or appropriate for PRPs, where reviewers are challenged to combine different criteria – academic and non-academic – into a single judgment. Selecting reviewers with expertise and experience and deciding between a single or multistaged review process need to be done programme by programme. Application and peer review burden should be reduced.

Supporting sustainability or scaling innovations

- Outcomes of PRPs accruing after project-end may include continuing collaboration, employment of programme participants, adoption of new technology, and methodology or practice or expansion of project effects. All projects end, but thought should be given at the outset to how sustaining or scaling benefits might be supported. Some funders build in supplemental or 'acceleration' grants for which project teams may apply.

C

Programme monitoring

3.0.

Introduction

Monitoring is an important activity for, among others, public accountability, steering the programme in the desired direction and supporting teams to succeed. Monitoring tends to be more demanding for PRPs than for academic research funding programmes. This is because both academic and non-academic partners are involved and more dimensions and processes need to be monitored.

This section emphasises monitoring practices and data that support programme- and project-level implementation. These two levels need common and specific indicators at different times. In the evaluation section, the dual purpose of project-level data for evaluation is outlined.

A monitoring framework should support implementation and information generated should connect components of the logic model to answer questions that include:

- Is the programme relevant to the needs it seeks to address?
- Is the programme efficient? Do inputs (effort and money spent) translate into outputs at a suitable rate?
- Does the programme allow funded teams to realise their expected outcomes?
- Is the programme impactful and, therefore, sustainable? Are the impacts of a suitable scale and do they address the wider problems identified?

Questions of efficiency, effectiveness, relevance, and impact/sustainability of a programme are also key and the monitoring framework should support both design and evaluation.

C

Programme monitoring

3.1.

Defining the aims and implications for monitoring

A key decision point for monitoring is the link between defining aims and expectations on the one hand and monitoring outcomes and impacts on the other. If programme aims and expectations are clearly defined, relevant monitoring data (qualitative and quantitative) can be identified.

All the programmes reviewed for the guide aim to fund research that addresses a specific problem or develop technological solutions in a specific sector. General aims then need to be understood in ways that can define what a successful programme or project looks like at two levels:

- What would programme success look like in terms that are measurable? What change should be observable between programme start and end?
- What achievements do funded teams need to demonstrate so that their contributions can be integrated with others to assess the programme?

Within a programme, different teams may make unique contributions. Some funders' monitoring approach specifies a range of expected programme outputs/outcomes, and constructs a monitoring system that tracks emerging results at project and programme level.

3.2.

Data and indicators

This section highlights data and the performance indicators for monitoring PRPs, starting with input (administrative data) and activities, and moving to output, outcome and impact indicators.

Setting up input and activity data

Funders may consider additional decisions to standard practice for monitoring inputs and activities. The following data types identify standard practice and where PRPs may need additional collection and monitoring.

- Application information: Grant application systems should allow funders to extract project-level information for funded- and non-funded applications. Funders typically create a database with the following information:
  - Programme competition: Name, title, dates.
  - Project proposal: Title, discipline and subject area focus, project abstract, funds granted to successful applications, proposed and actual start and end dates of all funded awards.
  - Proposal assessment: Outcome of all applications, including funded vs non-funded, assessment panel comments and scores, and for multistage assessment, which stages each application passed or failed.

C

Programme monitoring

- Applicant information: Personal (contact) and affiliation are regularly collected. Funders may need to alter or add to their information systems to include comparable information for non-academic partners. Additional information on non-academic partners may include organisation type (non-profit, for-profit, government), organisation size (small or large), location (country, region and city) and job role/ position of team members (seniority).

- Equity, diversity, inclusion (EDI) data: Many funders collect data such as gender, ethnicity, geographic location and age on applicants and applications.[17] For PRPs, non-academic outcomes may have explicit EDI objectives or there may be interest in understanding the distributional benefits to partners and/or beneficiaries. Tracking this data over time may require funders to establish new processes.

- Planned activities and types of interaction: Some funders require teams to submit workplans to support implementation and reporting, a practice that may differ from how they manage their academic research programmes. Monitoring the implementation of workplans may require new processes. Tracking interaction between academic and non-academic partners is another potential change to standard practice that might improve programme effectiveness. Research on university and industry interactions, for example, has identified different patterns and preferences for collaboration across different economic sectors and countries.[18] The implication for practice is that some fields of research and socioeconomic contexts are likely to benefit from formal partnerships (e.g. joint centres), whereas more informal or short-term partnerships (e.g. mobility grants, joint workshops) may be more suitable in others.

- Funding decision and feedback: Funders typically record funding decisions and feedback from assessment panels for a time. Preserving these data are important for PRPs that organise mid-term reviews or similar processes that require teams to respond to the feedback or recommendations of the merit/peer review panel. This information is also important for programme evaluations and when there is interest in comparing differences between funded and non-funded teams.

- Financial commitment and flows: Project budgets requested and allocated. Additional procedures may be required to monitor in-kind or direct contributions expected of non-academic partners. Some funders may need to adjust financial management practices to monitor funding flows to non-academic partners.

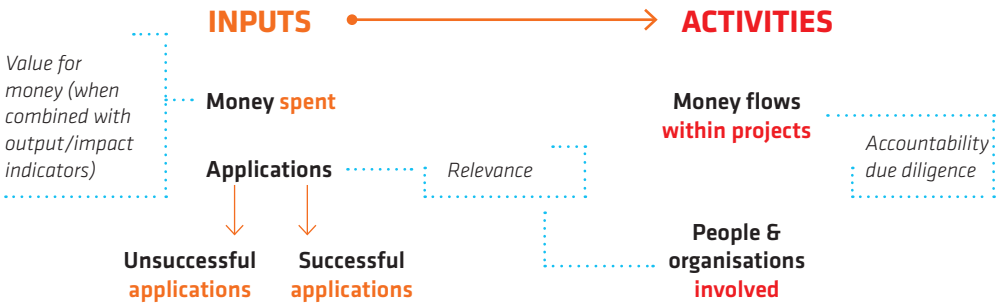
17. Consult the GRC's Gender Working Group publication for examples, https://www.globalresearchcouncil.org/fileadmin/documents/GWG/GRC_GWG_Case_studies_final.pdf.

18. Early research by Cohen, Nelson and Walsh (2002) demonstrated how different channels of interaction influence industrial R&D in the US. Similar studies in other countries conclude that channels of interaction are valued differently and that differences in economic structure shape what channels of interaction influence industrial R&D (Albuquerque, Suzigan, Kruss and Lee 2015).

Programme monitoring

Collecting these data and in a readily accessible form will support monitoring activities. Figure 15 relates these input and activity data to their use in monitoring and evaluation.

Figure 15: Indicators for input and activities



Source: Technopolis

As discussed above, application data can calculate programme success. Other application information (e.g. project abstract, and EDI data) can be used to assess programme relevance and profile. In short, these data can demonstrate whether the programme is attracting the right applicants and funding the right projects. Accurate contact data will facilitate applicant surveys and interviews.

Financial flows and contact information are essential for due diligence. Some funders may be particularly alert to the risks of supporting activities by organisations outside the public research sector.

Finally, applicant and financial data can support value of money and counterfactual analysis. If the pool of applicants is large enough, successful and unsuccessful applicants may be compared at programme end. Where appropriate, this method can generate causal inferences on programme effectiveness in supporting intended results.

Output, outcome and impact monitoring

It is important to distinguish between the academic and non-academic dimensions of PRPs, and between short-term results closer to the 'output' end and long-term results or impacts.

Participating funders use numerous indicators and reporting to monitor programme outputs, outcomes and impacts. For academic output indicators, funders emphasise academic publications, training and dissemination. Generally, there is more variation for non-academic output, outcome

Programme monitoring

and impact data. This variation stems from the range of non-actors involved and their interests and objectives.

For programmes supporting private sector innovation, the Organisation for Economic Cooperation and Development (OECD) Oslo Manual[19] and Frascati Manual[20] provide an internationally recognised methodology for indicator selection and data collection. These manuals have inspired indicator selection for industry-oriented programmes. Promoting standardised indicators enhances understanding by all involved and enables comparison.

There is yet to be a comparable approach and shared language for measuring social or government innovation, but proposed indicators and data collection methodologies are emerging (Box 5).[21]

Box 5: Standardisation of indicators and implications

Two review articles examining the literature on 'academic engagement' with non-academic partners published between 1989 and 2011 and 2011 and 2019[22] compare research findings and draw implications for research and practice. The latest article notes that for partnerships targeting social or government innovation:

- 'Less progress has been made [...] in relation to the standardisation of engagement measures or survey questions. The lack of standardisation is in contrast to the state of affairs in innovation studies where standardised measures have enabled extensive analytical comparisons between countries and over time [Oslo Manual].
- The case for standardisation rests on two arguments. First, the use of standardised measures facilitate the replication of results across contexts and help build a more robust picture of academic engagement. Notably, researchers would be able to conduct meta-analyses, which is currently impossible due to the inconsistency of measures. Second, standardisation would provide those interested in policy with more reliable evidence on the incidence of academic engagement across contexts. For instance, having comparable figures would help policy makers understand how their context compares to others and which areas or aspects require policy intervention.'

This call for greater standardisation presents an opportunity and a challenge for research funders: an opportunity to promote comparable indicators and benchmarks, and a challenge, particularly for social and government innovation outcomes, because there is no equivalent reference like the Oslo Manual.

19. OECD 2015.
20. OECD/Eurostat 2018.
21. For a discussion on the comparability of social and business indicators, see Havas 2016 and Gault 2018 for an integrative approach. Recently, the OECD started to develop frameworks and measurement tools for public sector innovation to complement its Oslo Manual. See OECD (2018a).
22. Perkmann et al. 2013 and 2021, p10.

Programme monitoring

Figure 16 identifies currently used indicators, noting some common indicators for different results. This presentation does not reproduce the full range of indicators used.

Figure 16: Output, outcome and impact indicators used by participating funders

OUTPUT

R&D

- *Academic publications/ communications*
- *Creative works/performances*
- *Prototypes developed*
- *Methodological advances*

Education

- *New course content/improved curricula*
- *Professional development*

Training

- *Student exposure to new research environments/methodologies*
- *Graduate degrees completed*

Goods

- *Technologies developed, tested*
- *Intellectual property developed (patents)*

Services

- *New/revised programs*
- *New/revised policy*

Processes

- *New organisational practice*
- *Production process*
- *Consultation and community consensus/ engagement*

Capabilities

- *Staff/management training, professional development*
- *Expanded/valued organisational linkages*
- *Ability to design, develop and adopt technological tools and data resources,*
- *Knowledge products: technical publications, policy reports, public service campaigns*
- *Behavioural change*

OUTCOME/ IMPACT BY SECTOR

Higher Education Academic

- *New research directions*
- *Access new research infrastructure*
- *Citation impact*

Financial

- *New/diversified research funding streams*
- *IP income*

Reputational

- *Awards, prizes, rankings*
- *Contribution to university mission*
- *Employer demand for graduate students*

Private Sector

- *Sales, profits, diversification, market share*
- *Jobs creation*
- *Spin-out/start-up companies*
- *Private investment secured*
- *Market development*

Government/ Non-profit sector

- *Relevant, accessible, effective services*
- *Contribution to public policy goals, e.g. sector growth, improvement on sustainable development goals, economic growth*

C

Programme monitoring

Open access to programme information and evaluations has made it easier for other funders to identify comparable programmes and indicators. Consulting funders' practice and using common indicators may streamline reporting practices and enhance relevance of data collected.

3.3.

Information systems for monitoring

Different information systems exist for capturing and using application and project-generated data. Some funders use standalone portals while others have developed information systems that combine internal information with project-generated data.

The programme review reveals a tendency to treat input data (financial investment and flows) differently or capture it in a different information system used for output, outcome and impact data. While funding agency staff may make internal data connections, external evaluators are concerned with how agencies systematise their efforts and data for both internal learning and steering, and external communication and accountability.

Internationally, there is a drive toward integrated grant management systems that combine application data, team reporting data and funding agency information. Such systems may also link peer-review assessments, and funder financial and monitoring data. Where data are not easily accessible or standardised, evaluation processes may require additional work from the funder and applicants. For example, if research outputs are not captured, a survey of teams may be required.[23]

As data privacy laws change, funders need to ensure the compliance of their data on applicants and grantees. The European Union's General Data Protection Regulation, which regulates holding personal information for long-term use, forced funding agencies to revamp their practices. Furthermore, it is good practice to make academic and non-academic partners aware what data is collected and how they will be used, and to obtain their consent.

When multiple funders are involved, monitoring data should be collected through a single system or be integrated. Use of each funder's in-house system should be discussed, as it makes reporting burdensome. As noted, consent to share data is needed from all involved.

23. For how information technology systems support monitoring and the functionality of different systems in use, see Technopolis 2018, section 2.3.

Programme monitoring

Programme support and facilitation

Funding agencies with a history of supporting academic research noted that when they introduced PRPs, they modified or developed new support and facilitation practices at the programme and/or project level. Such changes were less pronounced among funders with a history of funding mission-oriented research, co-funding programmes with government departments or supporting innovation activities with non-academic partners.[24] This experience had exposed agencies to similar issues and adjustments needed to support PRPs.

Table 5 identifies practices and the issue, opportunity or challenge addressed. Programme designs vary and the following practices may not be appropriate or warranted.

Table 5: Programme support and facilitation activities

Support / facilitation activity	Corresponding issue, opportunity or challenge
Outreach to non-academic communities/ potential applicants	Raise awareness of the programme, solicit feedback, increase percentage of relevant proposals
Host inception meetings/organise webinars	Build a common understanding of programme objectives and administrative guidelines/policies, facilitate networking among teams and implementation strategies, build rapport within teams and among teams
Support project team monitoring and evaluation	Some programmes require teams to develop their own or comply with programme-level evaluation frameworks. Supporting academic and non-academic partner understanding and support improves data quality for monitoring and evaluation
Feedback on technical/mid-term reports	Ensure teams have addressed comments raised by the funder/ expert reviewers, monitor emerging results, identify challenges and progress
Project site visits	Monitor emerging results, identify challenges and progress
Develop or support a common platform for sharing data, emerging results and novel applications	Leverage collective efforts and insights, increase visibility and disseminate findings

24. There are numerous frameworks, guidelines and reflections on promoting effective multisectoral and international collaboration. See, for example, Stöckli, Wiesmann and Lys 2018, Rybnicek and Königsgruber 2019, Greenhalgh, Hinton and Finlay 2019.

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Programme monitoring

3.5.

Reporting practices

Many of the PRPs consulted have common reporting standards and requirements but there are some differences:

- Combinations of annual, mid-term and final reports, in some cases all three. Some agencies invite or require award holders to report on project results after project-end and the final report has been submitted.
- Reports are almost invariably a mixture of quantitative and qualitative information. Common indicators are almost always used. Qualitative analysis is often required as well and there is a shift toward making project-level narrative reporting accessible to the public.
- Some funders work with documents to collect information from award holders, which is then entered onto an internal system. There is a clear trend toward grants management information technology (IT) systems, where award holders input their monitoring data and information directly in a format readily usable by the funder for monitoring and evaluation. Such systems sometimes have a public interface, where interested external parties can access information on funded awards.
- Practices vary on the formality of these reports. Project reporting is typically a contractual obligation with timelines for reporting and expectations for what is required. Some agencies attach milestone payments to reporting activities. Particularly for large network projects, some funders introduce periodic or mid-term reviews led by staff and/or external experts to assess whether teams are progressing satisfactorily. These reviews may have funding implications.

C

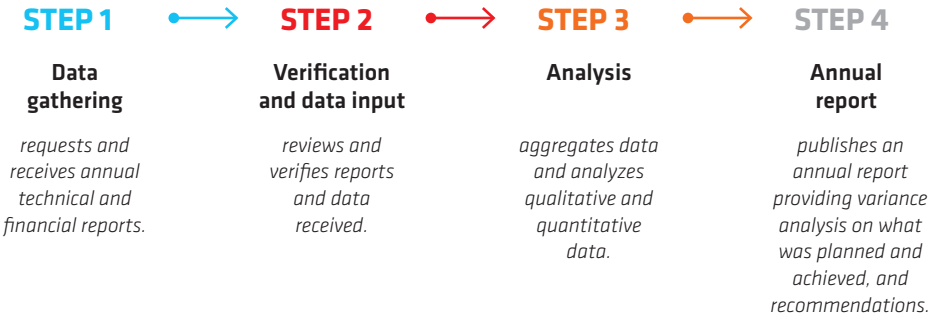
Programme monitoring

Box 6: Monitoring framework for CONCYTEC's Special Programme of Popularisation of Science, Technology and Innovation (2017 to 2021)

The Programme for the Popularisation of Science, Technology and Innovation (PPOP) promotes a science culture and knowledge society in Peru. This national programme invites broad leadership and participation across Peruvian society, facilitating collaboration within and among the educational system, businesses, media, government agencies and society. Activities that invite collaboration between academic and non-academic partners focus on knowledge mobilisation and translation events (e.g. Open Labs, Scientists go to School, science fairs; science, technology engineering, arts and mathematics careers for girls and youth, science and society colloquia).

Since the programme was established in 2016, Consejo Nacional de Ciencia, Tecnología e Innovación Tecnológica CONCYTEC publishes annual monitoring reports to track programme implementation. The results identify progress and recommendations for how CONCYTEC and participating agencies might better support programme implementation.

The monitoring system tracks project-level inputs, activities, outputs (e.g. knowledge mobilisation/ translation events and those involved) and expenditure aligned to PPOP's four objectives. Annual project reporting requires teams to provide technical and financial progress on templates aligned with PPOP's performance and result indicators. Annually, CONCYTEC's Evaluation and Knowledge Management Directorate implements the following four step monitoring plan:



Source: CONCYTEC 2021.

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Programme monitoring

3.6.

Key programme monitoring issues

The multiple aims, multisectoral composition and familiarity of non-academic partners with a programme's administrative obligations of PRPs raise additional considerations for how funders monitor their programmes. The following issues summarise the core practices discussed above.

Administrative data that accounts for academic and non-academic partners

- Documenting the full range or organisations involved assists with monitoring and evaluation.
- Many funders collect 'input' data on who applies, application characteristics and the outcome of assessment. These data can be used to understand the relevance of the programme by analysing who applies and who does not, and the diversity of proposals submitted and selected for funding.
- For programmes with periodic calls, tracking success rates over time can determine whether the programme design and proposal assessment are appropriate and support the programme aim.

Selecting indicators that reflect the activities and intended results of all partners

- PRPs tend to have more diversified activities and results than academic-led programmes. Suitable non-academic output and impact indicators need to be introduced and used.
- Experience has demonstrated the importance of team dynamics and indicators or narrative reporting should be considered that characterises how academic and non-academic partners collaborate. Understanding team dynamics may help teams and funders support effective teamwork and make programme-level adjustments.
- Alignment of indicators to standards-in-use such as the Frascati and Oslo manuals will improve understanding, measurement and benchmarking.

Ensuring project reporting is straightforward and understood by all

- Project reporting processes and obligations need to be communicated to all applicants. Academics tend to be familiar with the monitoring systems of research funders, but placing the responsibility on them may exclude perspectives of non-academic partners.
- If non-academic partners are to play a direct role in results reporting, additional guidance may increase compliance and quality of data.
- User-friendly IT systems enabling award holders to input their monitoring data can streamline reporting and may simplify a funder's ability to combine externally and internally generated data.
- Where multiple funders are involved, a coordinated monitoring approach is desirable, without which the reporting burden on project teams may increase and collected data may be redundant or challenging to integrate for evaluation.

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Programme monitoring

Keeping projects on track

- Most funders acknowledge that PRPs benefit from or require greater interaction with teams than do traditional academic-led research projects. Design features that promote collaboration between academic and non-academic partners, and that value the shared and individual goals of those involved may require funders to adopt 'non-traditional' approaches to supporting research teams.
- Additionally, larger networks or centres may benefit from a representative or advisory panel with authority to support and guide teams. These individuals need not be attached to the project full-time but should have coordination or oversight responsibilities. They may also be mediators if needed.

Ensuring proper use and distribution of funds

- When large consortia are involved, funds are managed by a number of academic and non-academic partners and when partnerships are international, funders may introduce new financial practices for accountability. This may lead to more stringent financial reporting than for standard research grants. Milestone- or timeline-based payments may be introduced to manage new financial risks.
- Early internal data connection between financial investment and flow and performance data (output, outcome and impact) may support learning and help external communication and programme accountability.

Extending the monitoring timeframe of a programme

- When a project grant ends, the dynamics may continue to generate results. Some funders require award holders to submit monitoring data after project-end so that outputs (e.g. publications) and outcomes can be captured, providing a more fulsome account than their final report.
- Some funders monitor sustainability indicators. Some programmes stimulate collaboration, so monitoring whether teams continue to interact informally or formally, or develop new collaborations is of interest. Longer-term tracking as described above can support this.

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Programme evaluation

4.0.

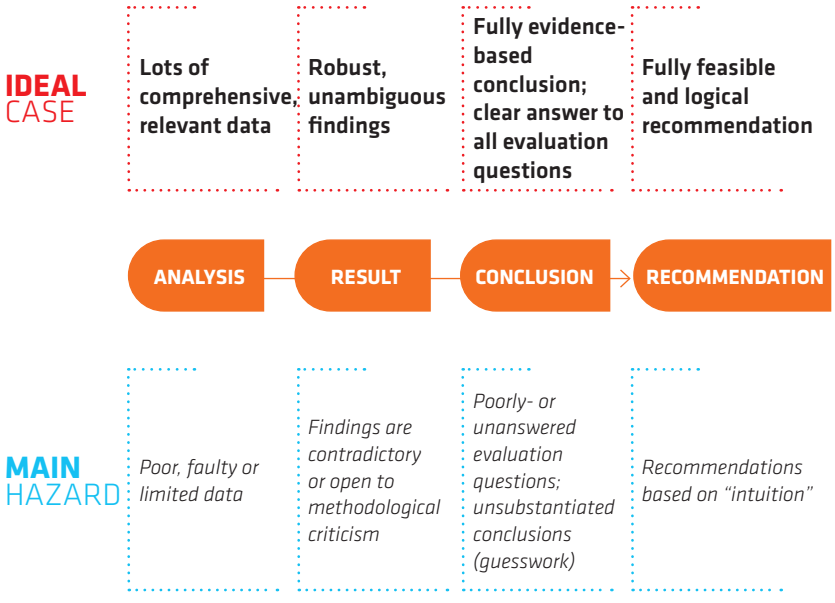
Evaluation Foundation

Funders undertake evaluations when they are interested in answers to questions such as:

- Did the programme generate the intended results? Were there unintended results?
- How well was the programme implemented? What supported implementation and what were the obstacles?
- How valuable were the results from the point of view of those directly involved (academic and non-academic partners) and from a systems or community perspective?
- How sustainable were the results and the partnerships?

The guidance above on programme design and monitoring will help position agencies to evaluate their PRPs and avoid evaluation hazards presented in Figure 17. Careful planning and implementation should support sound analysis and constructive recommendations.

Figure 17: From analysis to recommendations



Source: Technopolis

Programme evaluation

This section on evaluation builds on those steps and highlights the foundations for evaluation, including when and why evaluate, guidance on programme data, constructing an evaluation framework and evaluation methods. There is an extensive literature on evaluation methods and the topics covered here provide an introduction only. Box 7 selects several resources that provide in-depth technical advice.

Box 7 Select evaluation resources

Planning evaluations

- Gertler, P. et al. 2016. Impact Evaluation in Practice.
- Referencing national standards may also be important. See, for example, Kohlweg 2019. Evaluation Standards for Research, Technology and Innovation Policy, and UK Treasury 2020. The Magenta Book.

Private sector innovation

- OECD 2018. Oslo Manual.
- Council of Canadian Academies. 2013. Innovation Impacts: Measurement and Assessment.
- Crespi et al. 2011. Evaluating the Impact of Science, Technology and Innovation Programs: A Methodological Toolkit.

Social/public sector innovation

- Hallie and Beer 2014. Evaluating Social Innovation.
- European Commission. n.d. Better Regulation Toolbox.

Evaluation Database

- The Science and Innovation Policy Evaluation Repository (SIPER) includes numerous PRP evaluations. Search categories enable queries asking who are the 'target groups' (e.g. small and medium enterprises), the 'modality' (e.g. direct financial support) and 'policy objective' (e.g. diffusion of innovation, commercialisation, improving absorptive capabilities).

Programme evaluation

This section is informed by guidance from the evaluation literature and evaluations undertaken by Technopolis, and draws on funding agency experience and documentation.

Evaluation foundations

Evaluating PRPs draws on standards and norms for evaluating research programmes but owing to their design and aims, invites closer examination of collaboration and benefit flows. As with related programs, a PRP:

- Is undertaken for a reason (rationale)
- Has objectives that address needs or opportunities
- Provides inputs leading to activities
- Achieves outputs
- Spurs outcomes leading to impacts.

While the basic parameters of a PRP are comparable to those of other programmes, several important evaluation characteristics need to be considered.

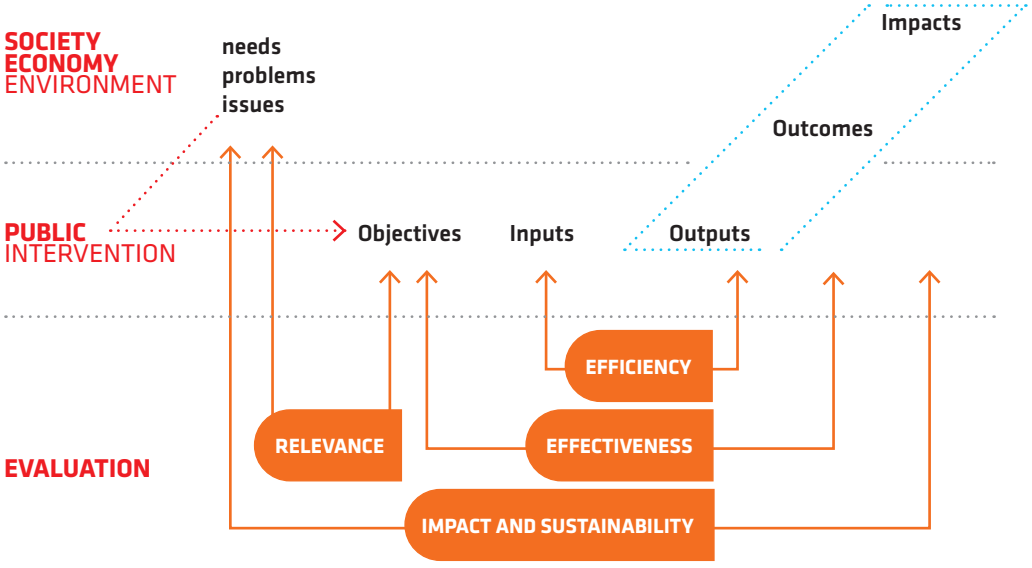
The following issues tend to make evaluations more involved than would be the case with either a purely research-focused or a purely business-support-focused program:

- PRPs typically have academic and non-academic aims and objectives, which make the intervention logic more complex.
- An important investigation point is the extent to which academic and non-academic objectives are mutually enforcing or create tensions.
- The partnership itself is significant: Important evaluation questions for PRPs include: Is the programme mutually rewarding, have partners gained a new appreciation of when and how partnerships advance their goals, and has the programme created conditions for ongoing collaboration beyond the programme?
- PRP intended outcomes and impacts often go beyond the readily quantifiable. This includes the aforementioned mutuality and longevity of the partnership, and its influence on organisation practice and policy, and on broad domains (e.g. grand challenges) where a change in state may be difficult to reduce to quantitative measures.
- Programmes supported by multiple funders bring together agencies with different mandates and, therefore, might address different strategic priorities. The priorities of the funders must be advanced by the programme and the evaluation.

To understand how PRPs work, how partnering may benefit the programme's outcomes and where conflict may occur, the combined programme logic presented in Figure 8 should be embedded throughout the evaluation plan. Figure 18 identifies key evaluation dimensions and questions connected to the programme logic.

Programme evaluation

Figure 18: Dimensions of an evaluation



Source: Adapted from European Commission 1999.

When and why evaluate

An evaluation serves many purposes:

- To find out if the programme is/was worth doing
- To identify unplanned/unintended consequences
- To minimise undesirable/negative consequences
- To learn from successes and mistakes
- To spread good practice
- To make the programme (and other programmes) more efficient and effective
- To ensure effective use of resources and maximum gains
- To inform future policy, planning and action

PRPs use both formative and summative evaluations. A number of programmes started as pilot or smaller-scale programmes that were expanded. During the pilot stage, funders supported formative evaluations to

When and why evaluate

complement programme monitoring. Formative evaluations provided feedback on progress and challenges, while summative evaluations at programme-end focus typically on quantifying outputs, and understanding outcomes and impacts.

The following table highlights the main questions of formative and summative evaluations, and differences in timing and intended uses.

Table 6: Questions for formative and summative evaluations

Formative	Summative
• Are we doing the right thing? • Are we doing it well?	• What difference does it make? • What do we do next?
• Undertaken during the programme • Assesses ongoing activities • Improving design and performance • Understanding what is and isn't working • Helpful for pilot or jointly funded programmes	• Undertaken at the end of a programme • Assesses programme impact - has it reached its goals? • Quantify change associated with the programme • Findings help decide if the programme should be adopted, continued or modified

The distinction between formative and summative evaluations overlaps with the issue of when evaluations of PRPs should take place. There are several times when different types of evaluation can be useful:

Ex ante evaluation: This is a scoping evaluation before programme launch, ideally before or with the programme design phase. The aim is to collect information that helps to shape programme design, ensure the programme is coherent and relevant to the challenges it seeks to address, and fully understand the nature and magnitude of the challenges. By definition, ex-ante evaluations are formative. They typically rely heavily on qualitative research methods and should involve consultation with potential programme beneficiaries (both direct and indirect) to assess what kind of programme they require and what characteristics would ensure objectives are met. Baseline data to describe the problems and challenges to be addressed is also an important part of ex ante evaluations. Not least, such data can ultimately feed into ex post evaluations to assess whether the programme has made a difference. Setting goals and identifying suitable outcome and impact programme indicators are important steps in such evaluations.

For PRPs, ex ante evaluation brings particular benefit if both academic and non-academic beneficiaries are consulted. This can identify possible conflicting aims and interests at early

Programme evaluation

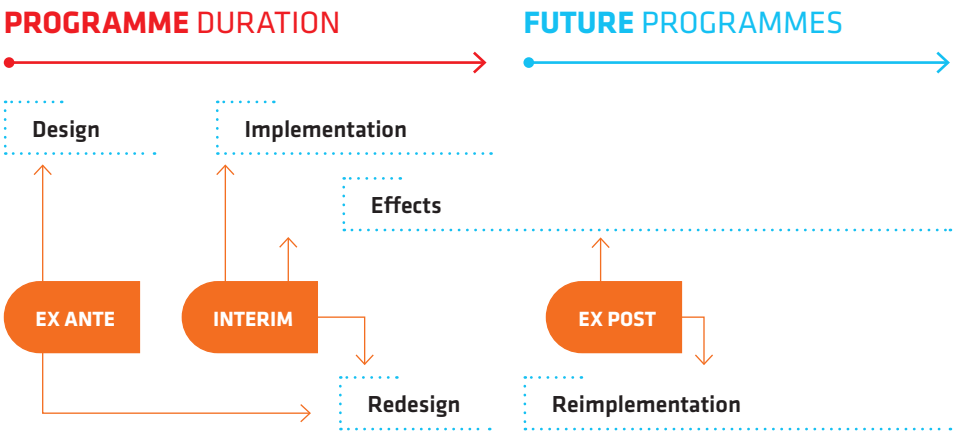
(which can be solved in the programme design) and reveal how complementarities between the two spheres can best be facilitated.

Interim evaluation: This may take place at any point and is both formative (do programme elements need to be changed?) and summative (what are the emerging outcomes and impacts?). Such evaluations may combine qualitative and quantitative data.

As many PRPs begin with pilot programmes or calls, an evaluation during or at the end of the pilot allows for amendments programme design before full long-term rollout.

Ex post evaluation: This evaluation identifies programme outputs, outcomes and impacts, and assesses whether it was run effectively and efficiently. It may also be formative, in that its findings may influence similar or a redesigned programme.

Figure 19: Timings of evaluation



Source: Technopolis

Ex post evaluations are typically at or near programme-end. For PRPs, this is a challenge as the wider non-academic impacts can take time to fully materialise (e.g. time needed to exploit new technologies, integrate training or insight into organisational practice or mobilise research evidence to inform policy processes).

Ex post evaluations at programme-end, support reimplementation efforts, but those done while outcomes and impacts are still materialising cannot demonstrate fully whether the programme reached its goals.

Programme evaluation

Academic studies have made inroads in understanding the longer-term impact of academic and non-academic collaboration. Tracing the academic origins of new products and large-scale surveys focusing on firm innovation and interactions between academics and non-academic partners has deepened understanding of the impact of research funding and the role of collaboration.

Studies in this tradition using funding agency administrative or programme data are not common. Interestingly, agencies such as Science Europe[25] and the US National Institutes of Health[26] are making these data available, enabling academic research to complement the evidence generated through programme evaluations.

4.2.

Clarifying programme aim and logic

Programme evaluations build on the design phase work to establish the aims and programme logic (Figures 9 and 10). With an understanding of a programme's logic and the context, a decision is needed on key evaluation questions, methods and data sources.

Tables 7 and 8 illustrate the aims and expected results of two programmes using the logic model framework. The NRF programme was a national initiative of significant scale and duration to enhance skills development and industrial competitiveness. The Neurodegenerative Diseases Research (JPND) programme is a transnational EU programme to coordinate research and collaboration to address societal challenges. It is one of 10 programmes expected to generate science and technology, economic and societal impacts.

25. Science Europe 2016.
26. National Institutes of Health 2019.

Programme evaluation

Table 7: THIRP's aim and expected results using a logic model

NRF's Technology and Human Resources for Industry Programme (academic-industry) **Aims: Leverage collaborative partnerships on a cost-sharing basis, for research and development in science, engineering and technology, to provide highly skilled human resources and technology solutions for improved industry competitiveness**				
Objectives	Increased numbers of people with appropriate skills	Increased interaction and mobility	Increased investment	Technology transfer
Inputs	Students	Researchers, students and technology managers	Grant funding	Resources (e.g. finance, people, infrastructure)
Outputs	Skilled graduates	Long-term relation between researchers and technology managers	Industry investment	Patents Prototypes
Outcomes	Application of skills in industrial settings	Employment of graduates	Products	Products
Impacts	Business innovation	Increased productivity and business innovation	Business R&D spending	Benefits to industry Job creation

The intended beneficiaries were participating firms and graduate students, leading to examination of skills acquired and employment outcomes on one hand, and firm innovation on the other.

The JPND programme lends itself to a different evaluation approach in terms of both intended beneficiaries and envisioned changes. Table 8 illustrates components of JPND's logic model. Even with this selective view, comparing the outcomes and impacts between this and THRIP illustrates that evaluation questions, data collection and analytical methods are programme dependent.

Programme evaluation

Table 8: JPND aim and expected results using a logic model

EU Joint Programming - Neurodegenerative Diseases Research (JPND) (public to public) **Aims: Align national programmes to increase their impact and effectiveness through a more coordinated and harmonised approach to reduce research duplication and fragmentation and promote more holistic and multidisciplinary research**				
Objectives	Framework for integrated approach in basic, clinical and healthcare research	Implementation of experiences into evidence-based policies and best practices	Stimulation of education and training of healthcare professionals	Raising awareness of research on neurological diseases
Inputs	Development of research strategy	Exchange of information on national programmes, research activities and healthcare systems	Facilitation of transdisciplinary and cross-sectoral mobility and training	Communication and dissemination of progress to stakeholders
Outputs	Better collaboration in research	Better collaboration in sharing of research infrastructures	Expansion of research activities Contribution to European-wide population-based studies	Establishment of patient cohorts Development of national research strategies
Outcomes	Better integration of basic, clinical and healthcare research	New diagnostics, preventive strategies and therapies in clinical pipeline	More effective transdisciplinary approach	Increase of strategic cooperation among EU Member States
Impacts	Model for future research collaboration	Increase of capacity in neurodegenerative diseases research	Reduction in healthcare costs Better patient care	Increased visibility of the burden of diseases at political level

Source: Neurodegenerative Diseases Research 2012.

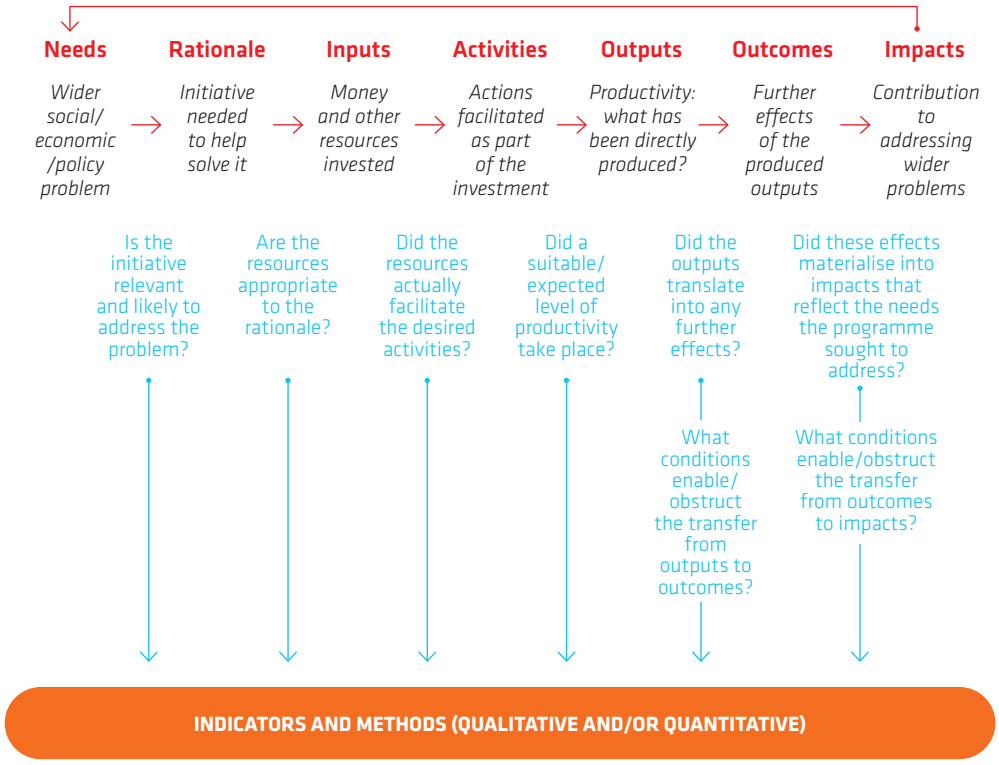
Figure 20 provides a generic framework for developing evaluation questions and thinking through indicators and suitable methods. For PRPs, the boxes that point to internal and external conditions that enable or obstruct the anticipated flow of benefits require careful attention.

The GRC's statement on the interplay between research and innovation made the point raised in theory and evident in practice that there are multiple pathways and conditions that enable/obstruct research from having broader societal impacts. These boxes remind evaluators to

Programme evaluation

identify these conditions as they are crucial in developing alternative explanations for why intended or unintended effects do or don't occur. They also raise important considerations for the choice of evaluation methods outlined below.

Figure 20: Basic evaluation framework: Illustrative questions and indicators following a logic model



Source: Technopolis

As noted previously, PRPs have academic and non-academic aims. Understanding this dual logic, asking questions such as those in the figure above and formulating indicators and methods are all essential tasks for evaluation. This approach identifies programme strengths and weaknesses systematically. A programme may, for instance, be appropriately designed, well managed and generate high-quality outputs, yet the intended impacts may not have materialised due to unforeseen barriers between 'outcomes' and 'impacts'.

Evaluation methods

Numerous evaluation methods are available to evaluate PRPs. Table 9 outlines core methods, their purpose and possible indicators. The choice of a method or combination of methods should be driven by programme aim and scale. Resource considerations or adherence to government guidelines may also influence the choice of methods. As mentioned previously, a formative evaluation will likely employ qualitative methods, while a summative evaluation would typically combine qualitative and quantitative methods.

Table 9: Core methods for the evaluation of PRPs

Method	Purpose	Possible indicators
Analysis of agency / administrative data	• Assessing programme profile, demand and success rate • Profiling applicants and award winners	• Success rate • Number of award holders and partners • Distribution of beneficiaries (e.g. by region, subject, gender etc) • Funds invested
Analysis of monitoring data/project reporting	• Assessing programme outputs • Assessing emerging outcomes and impacts	• Number of publications, training sessions, engagements • Prototypes, proofs of concept, new processes developed • Qualitative information, e.g. written accounts of impacts submitted by award holders
Survey of award holders	• Assessing programme management and user friendliness • Capturing additional outputs, outcomes and impacts • Capturing information on longevity of collaborations	• Satisfaction with various programme components (e.g. transparency and appropriateness of application process, support during the award) • Relationship with partners post-award • Quantitative and qualitative information on outputs, outcomes and impacts not captured by research information systems

Programme evaluation

Table 9: Core methods for the evaluation of PRPs

Method	Purpose	Possible indicators
Survey of partners and/ or wider stakeholders	• Assessing longevity of collaborations • Highlighting similarities and differences between award holders and partners (conflicts and complementarities) • Capturing downstream outcomes and impacts that may not be known to main award holders	• Satisfaction with various programme components (e.g. transparency and appropriateness of application process, support during the award) • Relationship with partners post-award • Quantitative and qualitative information on outputs, outcomes and impacts not captured by research information systems • Comparison and cross-checking with survey of award holders, including analysis of 'pairs'
Interviews with panellists and programme managers	• Gaining inside perspectives on how well the programme is operating • Checking for challenges in the application selection and award administration process	• All qualitative: Potential weak points in application selection and award management

Evaluations of this guide's PRPs frequently used the methods outlined above.

Table 10 identifies additional, data-intensive techniques whose appropriateness will depend on programme and evaluation aims. Some methods require considerable data gathering and analytical expertise to generate meaningful results. For example, econometric analysis comparing outcomes of funded and non-funded teams requires information on activities and performance indicators of firms or non-profit organisations that did not benefit from the programme.

Programme evaluation

Table 10: Data-intensive evaluation methods

Method	Purpose
Bibliometric analysis	• Bibliometric analysis yields quantitative information on the impact of published research outputs. This can be adjusted for field, and in some cases for country or institution. More advanced bibliometric analysis can also highlight citation patterns in geographical terms, highlight interdisciplinary trends, and track whether particular authors (e.g. partners) continued to co-publish after the award period ended. • A large body of academic publications resulting from the program is a prerequisite for such analysis to take place.
Social network analysis	• Can bring additional quantifiable information on the connections between people or institutions that occurred during and after the award period. • However, a dataset is required that allows for such analysis, which may often not be given. Attendance records of meetings, social media links or any other dataset illustrating connections between different people or organisations is a prerequisite.
Textual analysis of applications	• Analysing and categorising applications to a program can give a more detailed picture of the program's relevance. The proposed or anticipated outcomes and impacts can be classified, as can references to particular challenges or problems to be addressed. Mentions of business sectors or specific companies can also be logged. This more detailed picture can highlight to what extent applications truly address the program aims, and whether successful applications do so more than unsuccessful ones.
Textual analysis/text mining of interim and final reports	• Functions as above, though for large programs in particular, text mining techniques may be more economical and feasible than manual analysis. Using similar categories as above, outcomes and impacts, including indirect beneficiary organisations can be categorized and counted. Potentially, these can then also be contacted (via survey or interview) for additional information on what kinds of impacts actually materialized.
Survey or data analysis of unsuccessful applicants	• This can provide a possible route into a counterfactual analysis: comparing the further activities of un-funded applicants to those who were funded can give an estimation of the program's added value. Some un-funded applicants may for instance have subsequently found funding elsewhere, or may have undertaken the proposed activities anyway, albeit with fewer resources. • Such approaches only become appropriate in large programs, with plenty of applicants and non-applicants to choose from. In order to ensure a closest possible comparison, it is prudent to select only applicants who scored highly in the application assessment process, but narrowly failed to secure funding, and compare only to those who narrowly won it, disregarding those with exceptionally highly-rated applications.

Programme evaluation

Table 10: Data-intensive evaluation methods

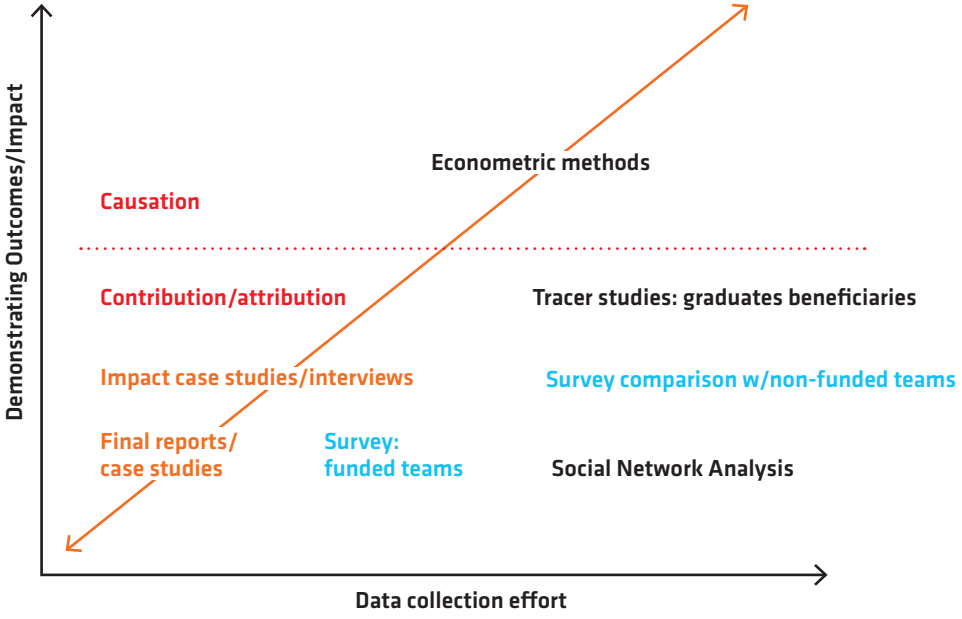
Method	Purpose
In-depth interviews with direct and/or indirect program beneficiaries	• This step brings more depth to any quantitative findings. Speaking to beneficiaries directly helps to develop an understanding of why certain output, outcome and impact patterns are observed and what barriers or enabling factors were at play. Outcomes and impacts can also be explained in more detail. • This is an especially important step for programs that seek to achieve non-academic impacts beyond the purely economic realm: progress on social, environmental or policy and practice issues may not be quantifiable in the way that economic growth might be. As such, qualitative data become especially important.
Impact case studies	• Much as the line above: in many cases, qualitative exposition of specific impacts helps provide a deeper understanding of how the program achieves its aims and what kind of effects it produces, in concrete detail. • Impact case studies can also serve additional outward-facing purposes beyond evaluation. Many funders showcase the impact of their funded projects for marketing purposes. If such case studies are well publicized, they may also raise the profile of a program and go some way to attracting more applicants from the intended constituencies.
Econometric / contribution analysis	• These types of analysis have been used primarily for understanding the impact of academic-industry programs. Availability of baseline and company data is critical here. In the ideal case, such analysis can go a long way towards assessing to what extent a particular program contributed to the wider economic trends it sought to influence (e.g. growth in a particular sector). Methods may make use of natural experiments (e.g., quasi-experimental designs) that compare non-funded and funded non-academic partner outcomes, or potentially randomized selection. See IDB (2011) for details.

A study examining evaluation of industry-support programmes presented choices along two axes.[28] One choice was whether an evaluation seeks to demonstrate the attribution/contribution of programme or a causal relationship of the programme logic (Figure 9). The other was the commitment of resources to data collection and analysis. The location of methods in Figure 20 presents a stylised visualisation of how suited different methods are to demonstrating causal relationships and the resources needed to implement the evaluation method.

28. Council of Canadian Academies 2013.

Programme evaluation

Figure 21: Stylised view of evaluation methods and data collection efforts



Source: Adapted from Council of Canadian Academies 2013.

The location of methods on the axes is suggestive. The reporting data collected by a funding agency, and the ease of providing and analysing it, influence overall data collection effort. Likewise, the position of a method on the vertical axis is subject to movement. As noted above, comparing funded and non-funded teams generally strengthens the ability to demonstrate how a PRP contributed to a given outcome or impact. For example, econometric techniques are higher on the axis than impact case studies, but this would depend on the kind of programme. Controlled case studies (funded and non-funded teams) informed by a theory of change for programmes with qualitative outcome measures may be more suitable or powerful in demonstrating impact than an econometric technique.

In choosing methods, evaluation requirements (if applicable), evaluation purpose and timing, programme design and aims, effort involved and resources should be considered.

The above lists are not exhaustive. Evaluation methods are constantly evolving. Emerging capabilities of big data and web analytics may yield further fruitful approaches and entirely new methodologies may emerge. Funders and evaluators alike will benefit from new methodological trends and possibilities.

Programme evaluation

Key programme evaluation issues

The issues below are good practice in promoting the use and legitimacy of evaluations more so than the 'how', 'when' and 'why' of the evaluation.

Many of the points apply to all programme evaluations, and with PRPs, many are more important given the involvement and interests of different partners and, potentially, different funders:

- Good programme monitoring supports robust evaluations. The expectation that evaluations reach evidence-informed conclusions on programme results can be greatly aided by good monitoring data. In the absence of agency-collected data, evaluators can develop programme logics and corresponding data, but this may take time and fail to integrate insights on the evolution of programme results.
- Choice of methods should be driven by programme design, evaluation purpose and resources. The evaluation methods outlined have different data requirements. Ideally, the design phase should identify and the monitoring phase should implement a data collection plan to support selected methods. PRPs need buy-in from programme beneficiaries, especially from non-academic partners who may not be used to participating in evaluations. Outlining expectations at programme start and involvement in evaluation can help evaluators.
- Evaluations can be conducted internally by the funder, which is helpful for organisational learning or externally by an independent contractor, giving greater legitimacy. While external evaluations are generally preferred by funders, organisational learning should still take place, by, for example, adding workshops to the study where evaluators and funders discuss emerging results.
- A suitable period should be dedicated to evaluation. Non-academic partners, in particular, may be difficult to contact for surveys or interviews, and a short study period may compromise the facilitation of internal learning. Six months may be suitable for minimum-scope evaluation, but longer periods should be considered for large programmes or with complex method components.
- Final evaluation reports should be placed in the public domain to support transparency, promote learning by peer organisations and ensure that evaluations contribute to the international evidence base.

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Design, monitoring and evaluation

Issues for further consideration

This guide presents outcomes from an analysis of 21 PRPs and literature from other prominent programmes. With its broad spectrum of examples and issues raised, it provides a reference for funders as they develop, implement and learn lessons from their PRPs.

This final section identifies topics that GRC participating members could explore further.

Programme design

- **Developing good funding partnerships.** Several programmes were jointly supported by two or more funders. What arrangements, tools and communication (and at what levels) have proven effective for funders in launching joint programmes?
- **Sharing and comparing programme designs and logic models:** There are few publicly available resources outlining the intervention and programme logics of PRPs. Lessons learnt from implementation and evaluation of programme design tools and from supporting programme implementation to 'get it right' could be shared widely to inform funder practice.
- **Communicating and engaging with non-academic partners:** PRPs allow funders to reach and engage new partners in their programmes and corporate missions. What kind of communication activities attract and involve applicants outside a funder's usual constituency?
- **Application assessment procedures:** What screening and assessment practices minimise the peer review burden and ensure all criteria (including non-academic) are suitably applied?

Monitoring

- **Standardising and comparing indicators:** Programme and published guidance review indicates that industry-focused programmes use community-generated standards. Frameworks and proposed standards are emerging in other fields. There may be a tension between standards in use and programme-relevant indicators, but the breadth of programmes supported by GRC could contribute to practice by identifying or developing useful standards or if funders wish to support benchmarking.
- **Programme support and facilitation:** What strategies have funders used to support implementation and facilitate collaboration within and across project teams? What lessons learnt and applicant feedback have informed a funder's position on monitoring?
- **Managing money flow:** What systems and practices have proven most effective in ensuring that funds reach all partners at the right time, in the right amounts and are used for the right purposes? As above, the balance between efficiency and effectiveness is crucial.

Issues for further consideration

- **IT system comparison and best practice sharing:** Managing programme- and project-generated information supports numerous processes identified in this guide. Within the working group, agencies used both off-the-shelf and internally developed IT systems but did not investigate their functionality. Exchange of information may support funders as they update their IT systems. For PRPs specifically, the following are especially important:
  - **User friendliness:** What systems have proven easy for academics and non-academics alike to understand and use (especially individuals not used to research funders' monitoring systems)? User friendliness should also be considered for funding organisation staff.
  - **Flexibility:** What systems are known to easily adapt to different programme types (e.g. in capturing indicators and data types in one programme that are not captured in others)?
  - **Interoperability:** What systems can effectively pull external data (e.g. project reporting, bibliographic data) and aggregate internal data (e.g. programme and project administrative data) so that relationships between these different data types can be analysed unproblematically for evaluation?
- **Sustaining partnerships and programme impact:** PRPs have a start and end date but those involved and outcomes achieved may continue to generate benefits well after projects end. Some agencies have support and tracing mechanisms (see evaluation below) designed to deepen or widen project and/or programme results. Lessons emerging from such agency practices may be of interest to others seeking to sustain programme results.

Evaluation

- **Opening administrative data:** Some funders make their administrative data available to researchers to support studies that can inform the rationale and design of PRPs. Peer learning on making administrative data open could interest GRC members.
- **Long-term tracking of award holders and partners:** Some agencies track individuals and organisations to assess whether the desired long-term outcomes and impacts of their funding have materialised? How funders maintain contact, mechanisms and incentives with former grantees to provide updates and insights from long-term tracking could inform the practices of funders managing PRPs.
- **Striking the right balance between quantitative and qualitative impact data collection:** Funders continue to make programme-specific choices on what quantitative and qualitative data should be captured and analysed. Funders have learnt lessons and new methods (e.g. permanent identifiers) are emerging to complement or replace information supplied by funded teams. Peer exchange on effective practices and new directions may strengthen agency practices.
- **Supporting evaluations:** Agencies evaluate their programmes and many publish evaluations. Academics, evaluation societies and multilateral organisations support better evaluation, share evaluative findings and conduct meta-evaluations. Mapping or understanding GRC members' potential contribution to this might open new avenues for funders to support and use evaluation findings.

Summary

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Annex 1: Partnered Research Working Group members

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6.2.

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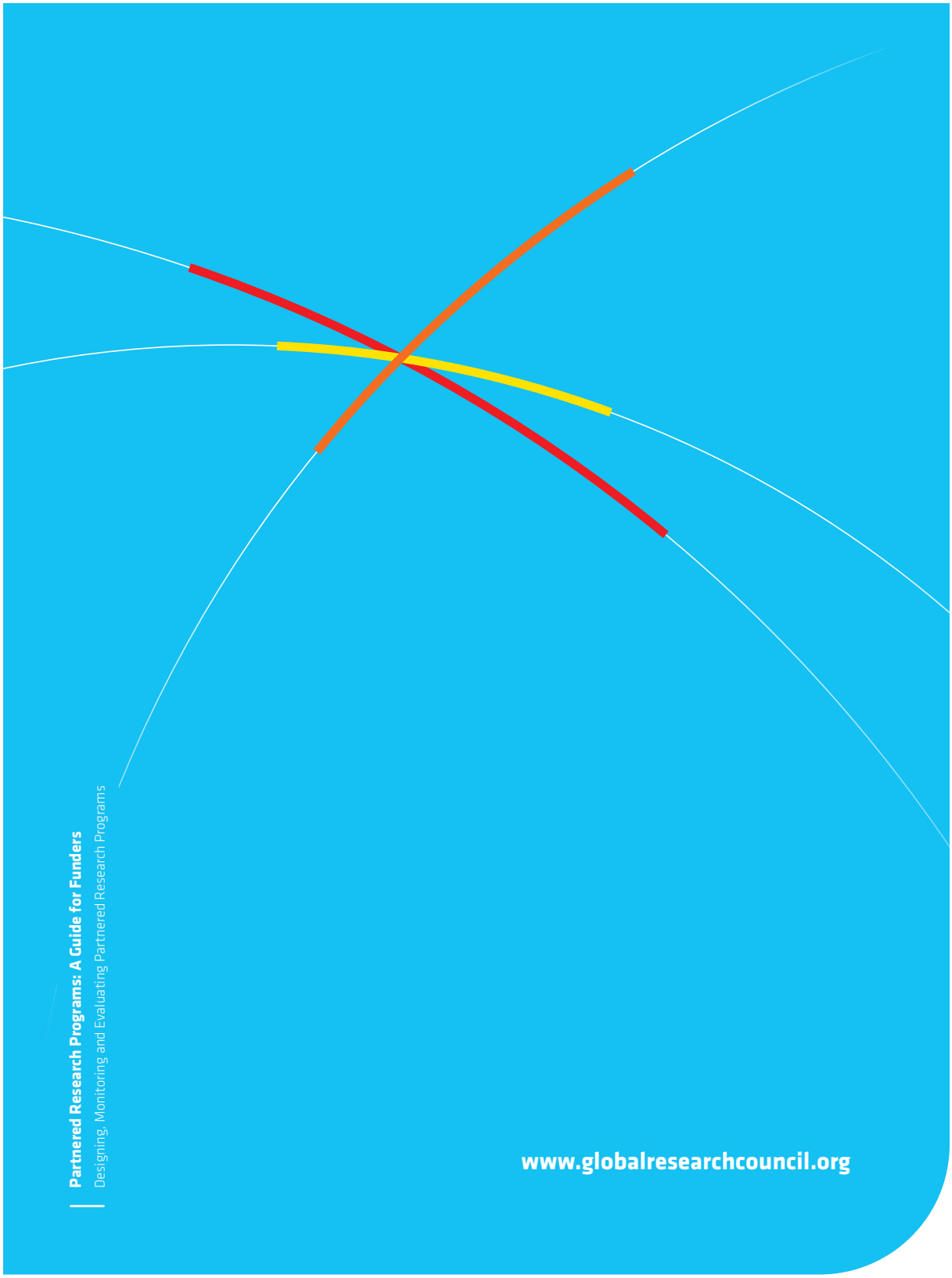
Partnered Research Programs: A Guide for Funders

Designing, Monitoring and Evaluating Partnered Research Programs



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