**Evaluating clusters: Where theory collides with practice**

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Abstract

Cluster policies are widely used to strengthen regional competitiveness, yet difficult to evaluate. While academic approaches to cluster evaluation are often ignorant of the needs of policy-makers and practitioners, practitioner-led approaches often lack structure and rigor. As such, there remain significant gaps between theory and practice. The contribution of this paper is to reflect on a unique methodological approach that has regularly brought together academics, policymakers and practitioners from around the world to collectively address the challenges of cluster evaluation. A participatory process of integrating theory and practice highlights the importance of triple helix engagement to co-design evaluation of what is a triple helix policy proposition.

Keywords

clusters, cluster policy, cluster evaluation, triple helix, practitioner involvement

JEL Codes

O25, O35, O38, R58

1. Introduction

The concept of geographically concentrated clusters of firms, research institutions and other organisations became popular in economic development policy circles during the 1990s, following the publication of Michael Porter’s *Competitive Advantage of Nations*. Porter defined clusters as “geographic concentrations of interconnected companies, specialized suppliers, services providers, firms in related industries, and associated institutions (for example universities, agencies and trade associations) in particular fields that compete but also cooperate” (Porter, 1998: 197). The potential for fostering cooperative alongside competitive relationships in a territorially-bound context has proved extremely popular among policy-makers. Authorities at supra-national, national, regional and local levels quickly began to integrate clusters into their competitiveness policy discourse and to design and implement policy initiatives explicitly geared towards identifying and supporting clusters. Today these are widespread (European Commission, 2019; Maffioli *et al.*, 2016; UNIDO, 2013), and even where not explicitly labeled as ‘cluster policies’ there is general acceptance of the need to design policies that nurture and support cooperative relationships among groups of firms and other agents (Huggins, 2000; Aranguren *et al.*, 2008; Schott and Wickstrom Jensen, 2016).

Yet despite the proliferation of cluster initiatives and widespread use of cluster and networking policies as an integral part of the policy mix employed to boost competitiveness and innovation, there remains a shortage of evaluation research and practice that enable a deep understanding of the impacts of these policies. This leaves cluster policies – and other policies based around fostering cooperative relationships – open to questions around their justification. Even more significantly it prevents learning that could improve the functioning of these policies and facilitate sharing of good practice.

Responding to the shortage of cluster evaluation research and practice is not straightforward. There are well-acknowledged methodological difficulties in evaluating the often-intangible impacts of clusters and cluster policies (Schmiedeberg, 2010; Aranguren *et al.*, 2014; Maffioli *et al.*, 2016). More generally, there is rising complexity in the design and implementation of regional competitiveness policies that stems from the increasing implication in policy processes of a wide diversity of actors from different parts of the triple helix (government, business, academia). Indeed, this is nowhere more present than in clusters. In such a multi-actor scenario Aranguren *et al.* (2016: 715) argue that evaluation can become transformative through its deep integration “into the competitiveness policy process as a dynamic, sophisticated and ongoing source of strategic intelligence”. This would imply that for effective policy learning to emerge around clusters, conceptual knowledge and methodological understanding on evaluation need to combine with the practical dynamics in which cluster policies and cluster initiatives play out. Expertise and experience from across the same triple helix that is engaged in clusters should be brought together to address the challenges of cluster evaluation.

This paper addresses the need for combining different types of evaluation knowledge in a multi-actor setting by reflecting on a unique seven-year process that has brought together academics, policymakers and practitioners from around the world to address the shared challenges of evaluating clusters. The seeds for this process were sewn between 2006 and 2012 in discussions at various annual conferences of TCI Network, a global network that brings together policy makers, practitioners and academics working in the clusters field. During this time, it became apparent that evaluation was a challenge with which many members of the network were grappling, usually in isolation and driven by their own specific agendas. This led to the establishment in 2012 of a working group designed to regularly bring together people with different types of knowledge, experiences and agendas to focus attention on solving some of the practical challenges of cluster evaluation. The key issue to be addressed was framed in terms of how to develop better approaches to measure the impact of cluster policies and initiatives, and in particular how to capture the value of collaborative working.

These challenges are highly relevant to three specific groups of actors: (i) academics that are researching clusters and their relationship with regional economic development; (ii) policy-makers (at different levels) that are designing and implementing cluster-type policies; and (iii) practitioners that are actively engaged in cluster initiatives (cluster managers, consultants, etc.). Each of these groups is well-represented in the TCI Cluster Evaluation Working Group (CEWG), whose initiation, development and emerging outputs are the focus of this paper. The main contribution of the paper, therefore, is to advance understanding around how such multi-actor spaces and processes can work as catalysts for bringing together diverse perspectives and experiences to explore, share and develop different types of evaluation knowledge. Moreover, in analyzing this specific process, the paper contributes to closing the widely acknowledged gap in understanding around the practice of cluster evaluation itself (Wilson, 2019).

The next section of the paper provides some further background on the evaluation of clusters and identifies five elements to the cluster evaluation challenge that shaped the motivation for embarking on this process. The case itself and the tools employed are then presented, leading to discussion and conclusions.

1. Cluster evaluation: Some context

Following the initial explosion of policy interest in clusters during the 1990s, criticism started to emerge in the academic literature concerning the theoretical and empirical basis of the cluster concept (Lorenzen, 2005; Martin and Sunley, 2003; Pitelis *et al.*, 2006). Both the policy popularity and the academic criticism was driven in part by the fuzziness of the cluster concept, which enables it to be molded to fit the interests of a wide range of policy-makers, but also makes it very difficult to empirically demonstrate its impacts, encouraging what has been labelled as a “pick and mix” approach to research evidence (Perry, 2005: 833).

Nevertheless, while the popularity of cluster policies has since ebbed and flowed, “on the whole they have proved to be extremely resilient” (Wilson, 2019: 372). A recent report by the European Commission (2019), for example, analyses 30 national cluster programmes and 55 regional cluster programmes in Europe, alongside 10 cases of policies beyond Europe (including in Canada, China, Japan, Mexico, Singapore, Taiwan and South Korea). UNIDO has also promoted cluster development projects in over 20 countries (UNIDO, 2013), and the Inter-American Development Bank has supported more than 300 clusters in Latin America and the Caribbean since the early 2000s (Maffioli *et al.*, 2016). In the European context the uptake of cluster policies has also been reinforced by devolution/regionalisation processes in many countries, alongside the increase in public-private collaboration in projects derived from EU structural funds (Lagendijk and Cornford, 2000; Rodríguez-Pose and Gill, 2003), and more recently by the promotion of regional smart specialisation strategies (European Commission, 2013) and the Horizon 2020 programme (Saha *et al.*, 2018).

There is significant empirical literature treating the various impacts associated with the underlying agglomeration dynamics that exist within industrial clusters (Audretsch and Feldman 1996; Boschma, 2005; Cainelli et al, 2016; Delgado et al, 2014; Greunz 2004; McCann and Folta, 2011; Martin et al. 2011a; Spencer et al., 2010). However there is limited and somewhat fragmented evaluation research into the workings and impacts of the policies that are employed to support clusters (OECD, 2015), with no generally-accepted framework for analyzing the effects of cluster policies. Indeed, Uyarra and Ramlogan (2012) review a diverse set of cluster programme evaluations covering issues ranging from cluster operations to collaboration outcomes to longer-term innovation and economic effects. They conclude that “overall, there was no clear and unambiguous evidence that over the long term clusters are able to generate strong and sustainable impacts in terms of innovation, productivity or employment” (*ibid.*, 35).

In this regard, Schmiedeberg (2010) provides an important overview of the distinctive methodological challenges that underscore cluster policy evaluation. These are rooted in the hybrid character of cluster policies, their blurred lines with traditional industry, innovation and regional policy, and the multidimensional, systemic concept of clusters. In turn they give rise to specific practical questions around evaluation organization, the definition of performance, how to attribute impacts and data availability. Rothgang *et al.* (2019), in their analysis of the German leading-edge cluster programme, link such methodological challenges to the inherent structural characteristics of cluster policies, which are characterized by complexity and strong links with other elements of innovation policy systems. This leads them to question whether the available methodological “toolbox offers the right instruments for impact analyses of ambitious, multi-facet programmes” and to find that it “has little to offer to come to terms with the evaluation challenges resulting from complexity” (*ibid.*: 1675). It also suggests the importance of positioning the evaluation of cluster policies within the overall context of the innovation policy mix and its governance (Magro and Wilson, 2013, 2019).

The complexity of cluster programmes and the challenges that this creates is also reflected in the work of Maffioli et al. (2016), who report on the challenges of measuring the impacts of the Inter-American Development Bank’s cluster development programmes in Latin America. They discuss a range of different quantitative and qualitative methodologies using specific cases from Argentina and Brazil. Highly conscious of the limitations of traditional impact evaluations that do not look beyond direct beneficiaries, they argue that “a first-order question of any impact evaluation of (cluster development) programs should be the extent to which they generate spillover effects” (*ibid.*: 13). While externalities beyond immediately targeted firms are often assumed to be positive, however, evidence suggests a more complex scenario. Figal Garone and Maffioli (2016) find mixed evidence in the case of Brazil’s local produictive arrangements policy, for example, and Audretsch *et al.* (2019) find negative impacts from the German leading-edge cluster programme on the performance of firms that are not in sectors directly addressed.

More generally in terms of the characteristics that make cluster programmes challenging to evaluate, Alfaro Serrano *et al.* (2016) make a key point in stressing the importance of understanding the mechanisms through which cluster policies work, and the time it takes for those mechanisms to generate different types of results. Indeed, this takes us to back to the distinguishing features of and underlying rationale for cluster policies. Following Wilson (2019: 376) cluster policies can be defined as “purposeful public and/or private actions that build (on) cooperative dynamics to strengthen the competitiveness of existing and emerging clusters”. They are thus premised on the hypothesized benefits of cooperation between firms and other actors to strengthen competitiveness; for example, sharing the costs of input purchases or risky innovation projects, or joint access to finance or international markets. Rather than dealing in subsidies or tax breaks for specific investment or innovation activities, they focus support on initiatives that foster a general atmosphere conducive to co-operative relationships. It is precisely this ‘soft’, relationship-driven characteristic that makes their evaluation so challenging because the immediate outcomes of the policy are largely intangible, and the very systemic nature of cluster initiatives mean that cause-effect relationships are difficult to isolate in the medium and long term. The cluster evaluation state-of-art is consequently characterized by fragmentation and partial analyses that leave significant questions unanswered.

On the one hand there are a range of academic impact studies that focus explicitly on firm-level impacts. These use data from individual firms that participate in cluster policy programmes and typically employ control group techniques in attempts to isolate the impacts of those programmes on productivity (Aranguren *et al.*, 2014; De la Maza *et al.,* 2012; Martin *et al.*, 2011b), employment (Doloreux *et al.*, 2016; Figal Garone *et al.*, 2014; Martin *et al.*, 2011b) or growth (Lehmann and Menter, 2017). The limitations of available methodologies to isolate such impacts are strongly evident in existing studies however (Aranguren *et al.*, 2014; Schmiedeberg, 2010; Wolfe and Gertler, 2004), and they often add little to understanding ‘why’ or ‘how’ the policy does or doesn’t work.

On the other hand, much day-to-day evaluation practice among policy-makers and cluster practitioners tends to be focused on monitoring either the operational policy framework put in place to support cluster collaboration (policy-makers) or the actual management of cluster initiatives (practitioners). This typically involves measuring collaborative activity (number of agents involved, or number of projects conducted) and reviewing effectiveness (what was done) and efficiency (use of resources). In this sense it is more akin to audit, and merely measures against the programme of work originally planned. It gives only limited insights as regards the impacts of the policies or initiatives, and often fails to adequately capture more qualitative elements, such as the essential role of trust-building and leadership, that are argued to be essential for successful clusters.

In this context Schmiedeberg (2010: 404) concludes by warning against the use of single evaluation methods which she argues can only “provide a very limited view on the cluster policy programme”. This is echoed in Aranguren *et al.*’s (2014) arguments for mixed methods and is reflected in various studies experimenting with innovative approaches. These include the application of systems thinking (Smith and Brown, 2009), participatory evaluation (Aragón *et al.*, 2014), fuzzy comprehensive evaluation (Lu and Chang, 2016), social network analysis (Guiliani and Pietrobelli, 2016) and novel forms of social capital measurement (Etxabe, 2018). Most studies in this emerging literature are fundamentally concerned with understanding the relational dynamics fostered by cluster policies and exploring their impacts. Felzensztein *et al.* (2018), for example, examine the long-term evolution of strategic inter-firm cooperation, Choi *et al.*, (2013) relate the structural and behavioral characteristics of clusters to their learning performance, and Lucena-Piquero and Vincente (2019) and Graf and Broekel (2020) both focus on the behavioural impacts of cluster policies as reflected in the development of knowledge networks.

While the recent development of studies in this area offers exciting possibilities, their use until now has been limited, fragmented and usually reliant on very specific data circumstances. There remain significant gaps between theory and practice around cluster policy evaluation, therefore, around which at least five elements to the cluster evaluation challenge can be identified. Firstly, it is important to better capture the more qualitative “human element” (or cooperative dynamic) that is essential for understanding the processes and linkages between actor groups that help build a successful cluster. Secondly, there is a need to convert emerging academic techniques and analyses (for example, social network or behavioral analyses) into the development of pragmatic indicators/approaches that have feasible data requirements in practice. Thirdly, a better understanding of the selection and combination of techniques and tools as appropriate to different circumstances is needed. Fourthly, given the multidimensional, systemic nature of cluster policies, there is a need to better understand how to evaluate the interactions that exist with other policies, instruments and initiatives. Finally, all of these areas need to be addressed in the context of a stronger emphasis on the contribution of indicators and evaluation to policy learning, rather than the more common narrow focus on audit.

What unites these different elements of the challenge is that they all require dialogue between academic researchers, cluster policy-makers and cluster practitioners if they are to be appropriately addressed. It was in this context and with this motivation that a long-term process of bringing together academics, policy-makers and practitioners with an interest in cluster evaluation was launched in 2012. The remainder of the paper focuses on this case and learnings that can be drawn from it.

1. The Case: Fusing academic and practitioner knowledge

The specific contribution of this paper is to reflect on and highlight results from a unique experience over seven years that has brought together academics, policy-makers and cluster practitioners from around the world to collectively address the challenge of cluster evaluation. This experience emerged from TCI Network, a global network of policy-makers, practitioners and academics working in the fields of competitiveness and clusters that celebrated its 20th anniversary in 2017.[[1]](#footnote-1) With a membership base from around the world, the network regularly brings together over 400 people interested in clusters and competitiveness policy at its annual conferences and facilitates a range of other activities for members such as policy peer review exercises. After many years of discussing the challenges of cluster evaluation on a more *ad hoc* basis at annual conferences, a decision was taken in 2012 to establish a Cluster Evaluation Working Group (CEWG). Having been significant contributors to the previous discussions, the authors were key protagonists in the establishment of the CEWG, and have been active in driving forward the group, facilitating activities, observing the emerging dynamics and capturing outputs. Since 2012 seven dedicated workshops have been organized, each bringing together 20-35 participants from academic, policy and practitioner circles from a wide range of countries.[[2]](#footnote-2) This has been complemented by special sessions at the TCI Network’s annual global conferences, various other *ad hoc* working meetings among members of the group, and the sharing of ongoing discussions, developments and outputs through an online platform on the TCI network website. The group has met at least twice a year, therefore, and Table 1 charts the progression of the activities since 2012.

*Table 1: Evolution of TCI Cluster Evaluation Working Group Activities*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Working Group Meeting**  | **Participants****(Policy / Practitioner / Academic)** | **Methodologies, Purpose, Themes** | **TCI Annual Conference Activities** |
| **2013** | Forres (UK) | 18 from 9 countries(9 / 4 / 5) | Exhibit from pre-prepared inputs by participants and group discussions:* Exchange of current practices
* Identification of key challenges
 | Kolding (Denmark): Keynote address & side-meetings |
| **2014** | Belfast (UK) | 25 from 11 countries(8 / 10 / 9) | Exhibit from pre-prepared inputs by participants and group discussions / interactive board game:* Good practices and techniques
* Human element of cluster evaluation
* Critical success factors for clusters
 | Monterrey (Mexico): Presentations in sessions & side-meetings |
| **2015** | Rzeszow (Poland) | 31 from 13 countries(7 / 16 / 8) | Small group dynamics to validate proposals and focus groups exploring new themes:* Initial development of survey questions to evidence collaborative dynamics
* Benchmarking of clusters
 | Daegu (Korea): Presentations in sessions and dedicated 2-hour ‘policy lab’ |
| **2016** | Barcelona (Spain) | 29 from 11 countries(12 / 10 / 7) | Small group dynamics to validate proposals and focus groups exploring new themes:* Perfect cluster framework
* Survey questions to evidence collaborative dynamics
* Guiding principles of evaluation
* Fit of clusters in policy mix
 | Eindhoven (Netherlands): Dedicated sessions in conference academic track and follow-up meeting |
| **2017** | Oslo (Norway) | 17 from 7 countries(8 / 6 / 3) | Peer review and exchange of pilot study results:* Programme level evaluations
* Evidencing cooperative dynamics
 | Bogota (Colombia): Dedicated workshop session |
| **2018** | Cork (Ireland) | 30 from 8 countries(12 / 8 / 10) | Experience exchange and small group dynamics:* Evidence of effects and framework of indicators
* Evaluating the contribution of clusters to smart specialization strategies
 | Toronto (Canada): Dedicated workshop session |
| **2019** | Malmo (Sweden) | 36 from 12 countries (17 /13 / 6) | Peer review and exchange of pilot study results:* Monitoring regional cluster portfolios
* Making use of survey & network data
* Evidencing the role of clusters in territorial systems/strategies
 | Antwerp (Belgium)Dedicated workshop session  |

A range of specific methodologies and tools have been employed at the workshops and conference sessions, and both the purpose and thematic focus of the sessions have evolved over time. To structure an analysis of the process and its evolution, three broad phases can be identified.

*Testing the water: Mutual understanding and scoping*

The first phase (2012-2015) was characterized by understanding the different experiences and perspectives of participants, identifying the specifics of the challenges surrounding cluster evaluation from those different perspectives, and scoping what the group wanted to achieve. The design of the workshops during this initial phase was critical because it was important to both awaken interest and ensure that the activities and reflections added real value to the diverse group of participants that were engaging from academic, policy and practitioner backgrounds. This is a challenging task as each comes with very different needs, expectations, mindsets and opportunities for action related to cluster evaluation: from policy-makers’ concerns around accountability and legitimization of their investments in cluster policies; to practitioners’ needs for practical tools for monitoring and learning about what works in specific clusters; to academics’ curiosity and desire to develop novel conceptual frameworks and uncover new empirical evidence.

The first three workshop sessions sought to meet this challenge by employing innovative methodologies for interaction among the participants (led by Glasgow School of Art’s expertise in participatory design approaches), alongside a clearly stated focus on identifying specific challenges (2013) and then pooling knowledge to deepen understanding around them (2014 and 2015). Specific methodologies included an ‘art’ exhibition in the first workshop as an initial sharing of experiences, to stimulate discussion of mutual concerns among participants. This led to the identification of three shared challenges: (i) the need to systematize a pool of good practices and techniques; (ii) the need to factor in the human element in cluster evaluation processes; (iii) the need to evidence and communicate critical success factors. These themes were followed up in the second and third workshops, supported by further creative engagement tools such as the design and use of a board game to deepen collective understanding and propose ways of addressing these challenges.[[3]](#footnote-3)

*Focused engagement towards concrete tools*

2015 marked a change in momentum for the working group, recognizing the need to maintain engagement by focusing activities on the development of concrete tools that could directly support participants in their day-to-day evaluation activities. This began at the third workshop, where discussions started to focus on the development of a survey tool that could be used to capture perceptions around collaborative dynamics in clusters in a way that could be compared over time and across different places. Using experiences from policy practitioners as well as academic theory, the survey (targeting cluster firms) incorporated traditional questions on engagement in cluster activities and economic performance with new questions on the structural dynamics (volume, type and extent) of collaboration, and the perceived strength and value of the collaborative activities undertaken in the cluster.

This work was continued at a ‘policy lab’ organized during the TCI annual conference in South Korea, which was based around an exercise in small groups to bring diverse knowledge from academia, policy and practice to bear on a common framework that could then be used to support evaluation efforts. This built on the principle that as the stage of development, growth and maturity of cluster initiatives (Menzel and Fornahl, 2010) changed, different types of evidence of progress could be anticipated. Documenting these different expected results would therefore support the evaluation of cluster interventions in different circumstances, providing guidance on where and how to collect evidence of the types of changes desired as a result of a given policy intervention. The stages explored in the hypothetical development of this ‘perfect cluster evolution’ were creation, growth, internationalisation and diversification,[[4]](#footnote-4) and the framework sought to articulate the evidence that may be found at each stage for changes in: activities (what is happening?), actors (who is involved?), resources (what money and physical assets are being used?), social capital (what type of behaviour do we see?) and results (what is being generated?).

Both the results of this exercise and the initial set of survey questions to capture cluster collaborative dynamics were brought back to the group in 2016 at the workshop meeting in Barcelona and a follow-up meeting in Eindhoven, where they were debated again, adjusted and validated, alongside a set of ‘principles for cluster evaluation’ that emerged in parallel during these discussions. The period 2015-2016 was thus characterized by a concrete focusing of the group’s activities. The combination of different types of (theoretical and practical) knowledge became explicitly reflected in the progressive development and validation of practical frameworks and tools that could be subsequently tested and used by group participants.[[5]](#footnote-5)

*Testing, benchmarking, peer reviewing and exploring new themes*

The most recent phase of the working group evolution, from 2017, has taken on a new impetus that draws on three sources. Firstly, some of the tools that were developed in the previous phase have been tested in practice by some group participants, and the workshops have provided a critical space to discuss results, benchmark against others and make adjustments. For example, the inputs from the perfect cluster framework exercise have been taken forward by some of the academic participants as an input, in combination with academic literature, for working on the different levels and scope of cluster policy impacts and how these translate into evaluation indicators. Another example is the testing of the common bank of survey questions designed to capture collaborative dynamics by both cluster policy-makers and academic researchers in a variety of different clusters and contexts (including in Spain, the UK, Colombia and Australia). Initial results have proved beneficial in evidencing the perceived value of collaborative strength, the types and extent of collaborative activities, and the return on investment of that collaboration. As well as testing and helping to refine the question set, the use of the survey in different regions is beginning to establish an opportunity to promote comparative analysis among those engaged in the process by using consistent measurement.[[6]](#footnote-6)

The second source of impetus in this latest phase has been the desire by several of the policy-makers in the working group to make use of the group’s collective and diverse expertise to peer review their cluster evaluation activities. Hence the workshops in 2017 and 2019, hosted by Innovation Norway and Skane Region (Sweden) respectively, included significant time dedicated to developing a deep understanding of their cluster evaluation activities and opening a critical peer discussion based on that understanding. This was combined with the third impetus, which came from new themes to explore emerging out of specific concerns of different groups of participants. These have included the increasing need to evidence the role that clusters and cluster policies play in regional smart specialization strategies and territorial systems more generally, and the need to make better use of the wider range of ‘big’ data that make possible new potential ways of analyzing network relationships.

As the process has evolved through these three phases, therefore, it has found ways of maintaining and renewing interest and continuing to engage all three groups: academics, policy-makers and practitioners. The mix of perspectives and continued engagement of these actor groups over time enabled key results in each of the phases (i.e. the identification of common challenges to address, the co-creation of common analytical frameworks and a survey tool, and the testing of common evaluation practices and use of the group for peer learning and exploration of new evaluation challenges). In addition to enabling the development of a common and more nuanced understanding of cluster evaluation challenges, the TCI Cluster Evaluation Working Group has also thus made progress towards new approaches for addressing these policy evaluation challenges. Most significantly, the regular and iterative nature of the activities along with the continuity of a significant proportion of the people involved, have facilitated a space for identification, exploration, testing and critical discussion that has integrated both theoretical and practical considerations and is accordingly generating different kinds of outputs (practical tools, peer review feedback, academic papers).

The key finding from this case is that by bringing together different types of evaluation knowledge and experience in structured learning and co-development processes, it is possible to both advance conceptual understanding of cluster policy evaluation and make progress towards addressing various cluster evaluation challenges in practice.

1. Discussion and Conclusions

The long-term process of academic-policy-practitioner engagement set out above opens the way to various reflections that are relevant for taking forward the cluster evaluation state-of-art, addressing some of the limitations highlighted by earlier studies (Aranguren *et al.*, 2014; OECD, 2015; Ramlogan and Uyarra, 2012; Schmiedeberg, 2010; Wolfe and Gertler, 2004). In particular, the outputs that have emerged and are emerging from the process provide a focal point for discussion.

The ‘cluster evaluation principles’ that emerged during the second phase capture in a broad sense the experience and knowledge of a diverse group of participants from different backgrounds collectively working to tackle a difficult issue. In the context of the working group meetings they have served as a nucleus around which to talk openly about individual challenges with peers, to identify shared issues, and to focus the evolving agenda of the working group. In a broader context they have been used to open and structure discussions with groups of policy-makers who are new to cluster policies and/or new to the challenges of cluster evaluation. In this sense they are a tool to connect with new participants as the reach of the working group expands/changes and are being used as an input for cluster policy training programmes.[[7]](#footnote-7)

The exercise based around a ‘perfect cluster framework’, on the other hand, has provided an impetus for a more structured understanding around the different types of effects that cluster policies might be expected to generate. It has served to kick-start a process of clarifying thinking around different types and levels of effects, shedding some light on the challenge of ‘defining performance’ that Schmideberg (2010) identifies as central. In particular, it brings a realistic perspective to the expectations of evidence of change as policies are implemented. The holistic nature of the framework is also significant because the heterogeneity of cluster policy programmes makes it difficult for academics, policy-makers and practitioners from different places to find common points of reference. Moreover, the framework itself was built from a wide range of different experiences and inputs and then progressively refined and validated by different groups. What emerges, therefore, is essentially a collective view, and such ‘single framing’ of a complex set of potential effects provides a shared reference point and language around which to continue engaging. Specifically, it enables academics, policy-makers and practitioners operating in different contexts to more easily relate to one-another, and in turn has the potential to open the way to new forms of cluster policy benchmarking and systematic policy learning.[[8]](#footnote-8) It is also proving to be a useful tool to prompt strategy discussions among cluster initiatives by helping them reflect on what stage they are currently at and how they might change their strategy to facilitate further progress. As such it reflects the notion of evaluation as a key input to strategy, a point we return to later.

The potential for benchmarking is illustrated by the pursuit of a specific need that was identified in the first phase of the process to improve on how the ‘human element’ of clustering dynamics are evidenced. In this regard the regular engagement facilitated by the working group is enabling headway to be made in exploiting opportunities for developing new indicators and data collection methods that respond to this challenge (which involves not only measuring the results of collaborative activity, but also the process of collaboration itself). Indeed, to use an illustration that emerged in one of the early workshop discussions, clusters have a certain parallel with meringues; there are a lot of soft elements in the process of collaboration that over time and with the right process, can solidify into real effects from collaboration, creating hard data from soft elements. The interface between academic analysis and policy practice is especially important for opening-up opportunities to better measure these soft processes and understand when (and when not) they are developing in ways that will ultimately solidify into hard impacts. Among a range of other debates – for example around the potential for connecting data from different types of collaboration-based policy programmes, or for using social network data to capture evolving network relationships – this has materialised in the construction and use of a survey question bank to capture the perceptions of cluster actors about the collaboration in the cluster.

Indeed, much of the value added by this long-term process of academic-policy-practitioner engagement can be related to confronting the data challenges that pervade cluster evaluation. The ability to collect relevant data, feasibly, is central to the methodological issues that make cluster evaluation so challenging (Schmiedeberg, 2010). A key advantage of this process of combining theoretical and practical perspectives has been to bring together different profiles in a way that the challenges of data collection can be truly appreciated, and realistic approaches developed. For example, the initial identification of the need for consistent and comparable data capturing the sophistication of collaborative dynamics within clusters led to the development of a survey bank of questions targeted at cluster actors. This built from a range of existing *ad hoc* experiences and approaches with the aim to arrive at a common bank of questions that could be used in different contexts, facilitating consistency and comparability. Yet the testing of the initial question bank in various contexts (among clusters in the UK, Spain, Colombia and Australia) led to a scaling down, simplification and change of language in the initial set of questions. This recognised both the practical limitations that policy-makers and practitioners face in collecting such data directly from cluster actors, and their knowledge around the type of language that firms are more comfortable with. In this sense purely academic approaches to cluster evaluation are often not realistic, and bringing practice, policy and academic voices into the room together is enabling more effective approaches to be developed that combine academic robustness with on-the-ground pragmatism.

The pragmatic dimension brought into the process by practitioners and policy-makers also highlights the unique contextual issues that are present in the cluster policy space around the types of impacts to be measured. Indeed, the sheer variety of specific approaches that fall under the broad label ‘cluster policy’, the *ad hoc* basis on which cluster evaluation tends to be conducted, and the challenges of collecting adequate data from cluster actors necessitate the coming together of academic expertise and analysis with the real-time and evolving experience of policymakers and practitioners. This experience demonstrates what can be achieved when that is done. It has become very clear during the process, for example, that there is ‘no one size fits all’ approach to cluster evaluation, despite policy-makers often searching for such a ‘golden bullet’. Approaches to cluster evaluation need to be adapted to the specific context of the region and intervention. However, the key finding of this research is that bringing together different experiences has identified common elements that are being shared and benchmarked, with the potential to facilitate deep policy learning and to ultimately boost specific practice in different places. Concretely, participants in the group have begun a journey of developing common language and understanding of how a complex set of issues fit together, focusing their own thinking and practice around the scope of evaluation (project, organization, policy), the different types of effects that can be expected according to that scope, and different ways and data through which those effects can be captured. This journey is making it easier, for example, to solve data challenges or to trial mixed methods, responding to issues raised by Schmiedeberg (2010) or Aranguren *et al.* (2014).

As such the key differentiating feature of this novel methodological approach for tackling the challenges of cluster evaluation is that it brings together the three elements of the triple helix that are themselves engaged in clusters. It is a co-design approach that facilitates the testing and comparison of cluster evaluation practice as it is being developed, enabling a deep integration of academic and practical knowledge. The results thus far demonstrate that it has the potential to move beyond the fragmented knowledge that currently characterizes the state of art in cluster evaluation. Moreover, the creation of new spaces and forums, sustained over time, for the engagement of triple helix actors could be seen to meet the conditions for what Aranguren *et al.* (2016) term transformative policy evaluation, whereby evaluation moves beyond audit to become a dynamic source of strategic intelligence for the policy process. Indeed, experience with this process demonstrates that such spaces can play an important role in bridging gaps and adjusting expectations and behaviours of academics, policy-makers and practitioners in ways that open interesting new possibilities for realistic processes of evaluation whose results can be used to inform future policy implementation.

There is clearly more work to be done in this area, to which the ongoing activities of the process analysed in this paper hope to contribute. In particular, the perfect cluster framework exercise has opened deeper questions around disentangling the different scopes of cluster evaluation (project, organization, policy programme) or the different levels at which effects are generated (among individual actors, within organisations, within territorial systems). With regards the broader effects on territorial systems, for example, there are important issues related to the role that clusters play in structural change or in smart specialization strategies, and to the impacts of clusters on the capacity to tackle social challenges (‘beyond GDP’) (Wilson, 2019). There are also clear opportunities from engaging further with some of the new approaches to evaluating cluster policies that are emerging, such as analysis of social media networks (Etxabe, 2018), or a stronger combination of case-oriented and quantitative analysis through the adaption of fuzzy-set qualitative comparative analysis for cluster evaluation (Ragin, 2000; Lu and Chang, 2016). Leveraging and connecting the different types of data collected by policy-makers over sustained periods of time could also support more widespread and consistent analysis of the types of behavioural elements of cluster networks that are starting to be explored (Felzensztein *et al*., 2018; Graf and Broekel, 2020; Lucena-Piquero and Vincente, 2019). Indeed, perhaps the key result of the process of academic-policy-practice engagement analysed here is the emergence of an exciting research agenda which brings together the interests and capabilities to act of the different participants. Moreover, collaboration as an approach is not isolated to cluster programmes, but increasingly underpins many innovation policy and other policy approaches. Thus, the advances generated by this process in terms of frameworks, indicators, data collection methods, etc. have relevance not only for cluster policies and programmes, but also for many other policies focused on strengthening collaboration.

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**Annex 1:**

The below photos illustrate part of the ‘art’ exhibition of cluster evaluation experiences that was used as a stimulus to begin the engagement process among academics, policy-makers and practitioners at the first workshop in Forres (2013) and the board game that was designed and used at the second workshop in Belfast (2014) to deepen knowledge-sharing around the cluster evaluation challenges initially identified.

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**Annex 2: Results from TCI Cluster Evaluation Working Group’s development of a framework to guide evaluation of what would be expected in a ‘perfect’ cluster**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Creation** | **Growth** | **Internationalisation** | **Diversification** |
| **Activity:** What is happening? | * (Regular) networking and interactive meetings/workshops across cluster actors
* Capability and market mapping
* Matchmaking
* Understanding target markets
* Defining area of specialization/value chain that draws initial perimeters of the cluster
* Establishing basis for a common vision/strategy
* Developing cluster brand
* Forming institutions (unique organisations/funds) to coordinate action
* Cluster intelligence
* Communication strategy and action plan (internal and external)
 | * Strategic planning
* Understanding and addressing barriers
* Identifying (longer-term) opportunities
* Development projects between different players (latest research being put into play)
* Skills’ training, workforce development
* Proactively strengthening industry-academic partnerships
* Building capability for the region
 | * Filling capability gaps
* Exploiting opportunities
* Identifying international partners; linkages with hubs internationally
* Development projects with new partners (outside cluster)
 | * More (and more ambitious) projects
* Different types of projects
* Cross-cluster platforms
* Other regional clusters
* Clusters of clusters
* International clusters/ partnerships
 |
| **Actors:** Who is involved? | A broad/diverse group: critical mass of interested actors engaged in related activities* SMEs (drivers) and large companies (enablers/accelerators)
* Researchers (thinkers)
* Practitioners (do’ers)
* Supportive government actors (but not too “directive”)
 | * Professional cluster manager/facilitator and core leadership group
* Entrepreneurs
* New cluster actors (expanding network)
* Government involvement aligned with cluster strategy
* Civil society
 | * Participants in regional strategy; cluster actors in other activities
* Other clusters and research actors outside region (including internationally)
* Venture capital (including international)
* Public support important (changing scope)
* Lawyers
 | * Participants in regional strategy; cluster actors in other activities
* Financial organisations
* Lawyers
* Venture capital (including international)
* Public support important (changing scope)
 |
| **Resources:** What money & physical assets are being used? | * Internal support; volunteers, in particular committed industry leaders
* Meeting space
* External (maybe public sector) support/seed financing
* Potential qualified management (resource-dependent)
 | * Membership fees
* Project resources
* Private sector R&D investments
* VC/entrepreneurship investments
* Public investment (within policy/programme)
* New joint facilities (test/demo, incubators)
* Knowledge resources (e.g. training)
* Cluster brand
 | * More private sector investments
* Transnational programme funding (e.g. EU)
* Project resources
* Intangibles (e.g. databases) and structured ways of working
 | * Transnational programme funding (e.g. EU)
* Project resources
* Intangibles and structured ways of working
 |
| **Social Capital:** What type of behaviour do we see? | * Willingness to engage
* Regular basis
* Strong social element and trust among regional actors
* Information sharing
* Positive atmosphere and behaviours
* Open minded
 | * Mobility between actors within the cluster
* More complex projects
* Knowledge-sharing and spillovers
* Commitment to solving common (wicked) problems
* Developing ways of operating
* Trust, confidence in the added value of the cluster members
* Strong and frequent internal communication
 | * International partners
* More expansive and inclusive
* Intercultural skills
* Creative skills
* Education links
* Finding commonality with other clusters
 | * New sector partners
* Partner clusters
* Education links
* Creative skills
* Boundary spanners
 |
| **Results:** What is being generated? | * New collaborative projects between small and larger companies in collaboration
* Foundations for value creation
 | * Spin-off businesses
* New companies; new actors
* Successful projects; value creation
* Local to regional spread (company, cluster + regional impacts)
* Media coverage
* Widening of cluster ecosystem & potential changes in cluster perimeters
* Opening up of specific development paths based on internationalization &/or diversification (see across)
 | * Better knowledge; new insights
* New business models
* Shared value
* Company growth (exports)
* Integration in global value chains
 | * New knowledge
* Spin-off businesses in new areas
* New markets
* Shared value
 |

**Annex 3: Principles emerging from the TCI Cluster Evaluation Working Group**

1. ***Evaluation for change***

Cluster evaluation is about learning, not just audit (although demonstrating return on investment is important). It is important to ask ourselves how the information will be used to change what we do and how we do it, and to review if we are doing the right (most relevant) things. Cluster evaluation should be a process of continuous learning that feeds the policy process; not just a one-off analysis following an intervention.

1. ***Audiences: Who is interested? Who is listening? Who should we talk to? How?***

It is important to think about different audiences (and potentially involve them in the evaluation design). Consider who is best placed to do the evaluation – cluster manager, independent reviewer, government agency – and ask what is most relevant for different audiences. Tips for reaching these different audiences include telling stories as well as facts, tailoring appropriate communication to the level of analysis (project, organization, programme, system), and presenting things visually to show progress and change.

1. ***Understanding the context***

Clusters demonstrate different evidence at different stages of development. It is important to know what to look for and to understand that things take time to mature. Understanding the context also implies understanding the external environment in which clusters operate and their interactions with other actors and with other policy programmes.

1. ***What should we measure?***

Evidence should be captured against:

* The ‘why’: Growth and change in regional economic structures.
* The ‘what’: Specific cluster interventions (e.g. access to finance, skills, infrastructure, knowledge and innovation, markets).
* The ‘how’: Development of social capital and collaborative behaviour.

It is important to link to objectives (have we done what we set out to do?), to focus not just on activity but also on results and impact, and to consider the wider social impacts of clusters ‘beyond GDP’.

1. ***When should we measure?***

Clusters and cluster policies work on very long timeframes. Evaluation should appreciate that desired impacts may only emerge in the long-term, but look to capture short-term ‘hits’ along the way. However, evaluation thinking should start immediately to establish a baseline from which to track changes.

1. ***Social capital and trust is the foundation of cluster working***

It is critical to find ways to show progress and change in the softer – human – elements of trust, motivation, satisfaction and behavioural change that are the foundation of clusters. Such changes should be linked to more tangible results (e.g. has the collaboration led to new/diff­erent services, attracted new customers, led to new partnerships etc.?). It is possible to collect ‘hard data’ on ‘soft issues’, but innovative proxies and more qualitative approaches will also be important.

1. ***Be aware of the challenges and innovate to overcome them***

Causality is difficult to prove, and control groups are hard to find. Consider showing progress against baselines, mixed methods, story-telling and above all a “basket” of evidence to demonstrate change.

1. See [www.tci-network.org](http://www.tci-network.org). [↑](#footnote-ref-1)
2. These participants were self-selected according to their motivation and interest in collectively exploring cluster evaluation challenges (each had to pay for their own participation costs). While a core group of around 20 participants have engaged regularly, attending most of the activities over the seven years, other participants have come in and out for specific workshops and conferences and each activity has attracted new participants. In total the activities have engaged over 100 participants during the seven-year period. [↑](#footnote-ref-2)
3. See Annex 1 for an illustration of the ‘art’ exhibition and board game workshop tools. [↑](#footnote-ref-3)
4. It should be noted that increasingly internationalisation is essential at an early stage of cluster development, but was articulated as a separate stage to explore different factors that might evidence success depending on strategic focus. [↑](#footnote-ref-4)
5. The resulting ‘perfect cluster framework’ and ‘principles for cluster evaluation’ are included in Annexes 2 and 3. [↑](#footnote-ref-5)
6. For example, similarities and differences in survey results between Scotland (UK) and Basque Country (Spain) are currently being compared by the policy-makers and researchers in these regions. [↑](#footnote-ref-6)
7. For example, a new teaching case on cluster evaluation, drawing on the principles and other experiences from the working group, has been written and piloted for the European Foundation for Cluster Excellence ([www.clusterexcellence.org](http://www.clusterexcellence.org)). [↑](#footnote-ref-7)
8. Cluster organisation benchmarking is already a common practice, facilitated by the well-established labelling framework of the European Secretarial for Cluster Analysis (ESCA) (see [www.cluster-analysis.org](http://www.cluster-analysis.org)). However, this framework is confined to benchmarking cluster organisations themselves. While it provides a valuable tool for organisational learning oriented to certain cluster practitioners, it does not facilitate benchmarking of the results of cluster’s collaborative dynamics, which are also likely to be of interest to practitioners and are of primary interest to policy-makers and academic researchers. [↑](#footnote-ref-8)