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## **Evaluating inclusion as a multidimensional science, technology and innovation policy objective**

Helka Kalliomäki, Jari Kuusisto and Leena Kunttu

Inclusion, as an increasingly important science, technology and innovation (STI) policy objective, is seen as a key to global sustainable innovation. Yet the concept's usage in both practitioner, policy and research language is often fuzzy. Inclusion is used in wide variety of contexts, not just those that have been traditionally associated with the concept such as marginalized groups and communities. The objective of this chapter is to unpack different dimensions of inclusion as an STI policy objective and as an object of evaluation in an increasingly complex innovation space. The chapter presents a schematic conceptual framework of the different approaches that can be used to steer evaluation practice. It also maps future research directions for evaluating inclusion.

### **7.1. Introduction**

Inclusion as a policy objective has been increasing its significance in science, technology and innovation (STI) policy agendas globally. It is seen as key to global sustainable innovation. The OECD has brought inclusive innovation policies into the discussion as “policies that aim to remove barriers to the participation of individuals, social groups, firms, sectors and regions underrepresented in innovation activities” (Planes-Satorra & Paunov, 2017, p. 6). The goal of this approach is to enable broader participation in innovation by providing equal opportunities for different members of society.

However, the concept's usage in both practitioner, policy and research language is fuzzy. Inclusion is used in wide variety of contexts, not just those that have traditionally been associated with the concept like gender, ethnicity, income and geography. In addition, it is possible that individual mindsets are inclusive, and this can be reflected in the purpose and design of an organization. In the context of STI policies, inclusion can refer to involving various stakeholders in research and innovation (R&I) processes, as well as the participation of women, underrepresented minorities, persons with disabilities and youth in research and education activities (e.g., Harsh et al., 2018; Woodson, Hoffmann & Boutilier, 2021; Kalliomäki et al., 2024). However, partly due to its ambiguous use and nature, implementing inclusion as an STI policy objective has met a variety of challenges dealing, for example, with problems and lacking competencies in policy framing and delivery (e.g. Planes-Satorra and Paunov 2017).

Despite these challenges, inclusion attains a level of conceptual value as a metaphor that reflects broader societal values. In addition, it adds value due to its function as an integrative policy concept

as inclusive policies cut across diverse policy sectors. Indeed, inclusive societal development has increased its significance as a cross-sectoral policy objective largely due to increasing inequalities witnessed at different scales and contexts of societal development (George et al., 2019; OECD, 2015). There is an evident need for more inclusive policies, not just in the domain of STI policy.

It is important to be clear when we discuss inclusion, as conceptual ambiguity can be harmful for goal-oriented STI policy development and evaluation. This presents a challenge for the theory and practice of evaluation, as “proper assessment requires clear definitions of inclusive innovation” (OECD, 2015, p. 61). Meanings of inclusion are also highly context specific, calling for culturally sensitive approaches to policy design and evaluation. Furthermore, a dimension often neglected in current approaches deals with the agency of those included, which itself often plays a key role in policies targeted at increasing the societal impact of STI (Kalliomäki et al., 2024).

The objective of this chapter is to unpack different dimensions of inclusion as an STI policy objective and as an object of evaluation arising from the twin challenge characterizing STI policy debates:

1. *Highly complex policy discussions* related to, for example, transformative and mission-oriented policies, further complicate the fuzzy STI policy landscape in which inclusion should be increasingly promoted as an important policy objective. In addition to this complex policy landscape, the promises and challenges of inclusion are explored as they might come with tradeoffs that are not sufficiently understood nor discussed in academic and policy literature related to the rapidly evolving innovation space.
2. *Many meanings of inclusion* direct attention to a need to unravel different dimensions of inclusion as an STI policy objective. Current debates in STI policy literature pay increasing attention to inclusive R&I processes and bottom-up agency as an important component in inclusive and effective policy-making. The intent is to map some of the key dimensions present in current debates to broaden understanding of the multidimensional nature of the topic and argue that the picture related to inclusion is often poorly captured in the language of researchers and practitioners.

Based on the above, we offer ways to approach evaluation research and practice seeking to address the complex mesh of different dimensions of inclusion in a constantly evolving and increasingly complex innovation space. We present a schematic conceptual framework of the different approaches that can be used to steer evaluation practice, with the objective of contributing to the debates on conceptualizing and approaching inclusion as a multidimensional STI policy objective. The chapter will conclude with a set of guided readings, which aim at providing interested readers with a variety of perspectives demonstrating the colorfulness and multidimensional nature of the topic at hand.

## **7.2. Inclusion as a science, technology and innovation policy objective**

STI policy is a complex and multidimensional field, with the dimensions of inclusion varying according to specific contexts and policy goals. Such dimensions of inclusion in innovation policy include (see, e.g., Lawson, 2010; Moulaert et al., 2013; Armendaris, 2015):

1. *Social inclusion*: the extent to which innovation policy addresses the needs and interests of diverse social groups, such as women, minorities, persons with disabilities and

disadvantaged communities. Social inclusion can be promoted through policies that provide equal access to education, training, funding and other resources for all individuals and communities.

2. *Economic inclusion*: the extent to which innovation policy promotes economic growth and development that benefits all members of society, including those who may be marginalized or excluded from traditional economic opportunities. Economic inclusion can be promoted through policies that support entrepreneurship, innovation and job creation in underserved communities.
3. *Geographic inclusion*: the extent to which innovation policy promotes innovation and economic development in all regions and areas, including rural and remote areas. Geographic inclusion can be promoted through policies that provide infrastructure, funding and other support for innovation, entrepreneurship and competence building in underserved regions.
4. *Cultural inclusion*: the extent to which innovation policy recognizes and values diverse cultural perspectives and practices and promotes innovation that is respectful of and responsive to different cultural contexts. Cultural inclusion can be promoted through policies that support the participation and engagement of diverse cultural communities in innovation and entrepreneurship.

The rapidly growing emphasis on inclusion in the STI policy sphere arises from widening inequalities in diverse geographical and societal contexts globally. This is important as the erosion of democratic legitimacy and public acceptance of representative decision-making increases the pressure to develop inclusive processes in which a wide variety of stakeholders can participate. A lack of inclusion is considered a major challenge in science and innovation activities in many countries (Planes-Satorra & Paunov, 2017), with the result that inclusion is seen as an increasingly important dimension of innovation policy that can help to ensure economic growth is equitable and sustainable. Inclusion can also mean that both the policy process and the benefits of innovation are shared by all members of society. Inclusion is clearly included in the UN's Sustainable Development Goals (SDGs), connecting it both vertically and horizontally to diverse contexts of policy-making.

#### **7.2.1. Promises and challenges of inclusion**

The promises and advantages of inclusion are summarized in Table 1 alongside some of the key challenges. It is important to pay attention to the versatile uses and impact pathways emerging in this field as the pathways are not always beneficial to long-term STI policy goals. Inclusion can be a powerful policy concept and contribute greatly to sustainable societal development via a broadened STI policy community and an enlarged group of beneficiaries, but it is important to emphasize that any tradeoffs should be made visible for transparent policy-making and delivery. Research on inclusive innovation has evolved in diverse clusters, emphasizing not only innovation as a tool for inclusion and affordability, but also capacity-building, innovation constraints associated with social empowerment and innovation as an inclusive system (Mortazavi et al., 2021). The alleviation of poverty through empowerment has also been raised as one of the key baseline justifications for supporting inclusive innovation strategies. Another important justification for increased inclusion relates to the contribution to strengthening democracy and trust in government (OECD, 2015).

Table 1. Synthesis of some of the key promises and challenges of inclusion in the STI policy domain

<b>Promises</b>	<b>Challenges</b>
<ul style="list-style-type: none"> <li>- Poverty alleviation through empowerment and innovation-based approaches</li> <li>- Diversity of actors and viewpoints benefits innovation</li> <li>- Harnessing full potential of society for the benefit of STI</li> <li>- Improvements in societal involvement and equity for underrepresented groups</li> <li>- Higher acceptance of R&amp;I results, and better correspondence with the needs of the end users</li> <li>- Improved product uptake and more equal access, better ownership of communities involved</li> <li>- Equality inside professions and organizations</li> <li>- Improvements in democratic legitimacy and acceptance of policy-making</li> <li>- Constantly growing number of actors in the evolving innovation space broadens the scope of beneficiaries and sources of innovation</li> </ul>	<ul style="list-style-type: none"> <li>- Highly complex policy environment</li> <li>- Instrumental/quasi-inclusion, partnered with a lack of trust towards inclusive initiatives</li> <li>- Power imbalances and dominance of certain groups in inclusive processes</li> <li>- Lack of competencies in managing, recognizing the importance and promoting inclusive initiatives</li> <li>- Difficulties in scaling up successful initiatives, inadequate access to expertise and finance</li> <li>- Narrow definition of innovation itself reduces possibilities related to inclusion</li> <li>- Conceptual ambiguity, unclear objectives and blurred policy boundaries, also related to the constantly growing number of actors in the evolving innovation space</li> <li>- Potential value conflicts between emphasizing inclusion vs. innovation, and broad stakeholder engagement vs. scientific freedom</li> </ul>

Altogether, as innovations tend to primarily benefit advantaged societal groups (e.g., Chataway, Hanlin & Kaplinsky, 2014; Woodson, Hoffmann & Boutilier, 2021), it is an important goal of STI policies to broaden the beneficiaries towards diverse underrepresented groups, hence reducing inequalities (Harsh et al., 2018). These groups include, but are not limited to, those that are excluded due to race, gender identity, sexual orientation, age, physical ability, income, language and/or immigration status (e.g., Baah, Teitelman & Riegel, 2019). Exclusion may also take various geographical forms (e.g., Rodríguez-Pose, 2018). In addition, inclusion can relate to issues such as the diversity of actors and viewpoints being beneficial to creativity and innovation (e.g., Nathan, 2015; Nielsen, Bloch & Schiebinger, 2018); potentially higher acceptance of R&I results and better correspondence with the needs of the end users (e.g., von Hippel, 2009; Hewlett, Marshall & Sherbin, 2013), including improved product uptake and more equal access, as well as better ownership from the communities involved (OECD, 2015). In addition, inclusion is associated with improvements in societal involvement and equity for underrepresented groups (e.g., Foster & Heeks, 2015; Planes-Satorra & Paunov, 2017) and enhancement of the diversity of the workforce in STI activities and science, technology, engineering and mathematics (STEM) fields (Woodson, Hoffmann & Boutilier, 2021).

Innovation itself can work as a tool for inclusion (Mortazavi et al., 2021), and involving underrepresented groups in the processes of innovation can lead to wider inclusion at the societal level – the “digital divide” is a practical example of a technology-based form of social inequality that has many consequences. Non-inclusive designs may lead to underrepresented users facing barriers in accessing essential online services (Sin et al., 2021), highlighting the need to involve

marginalized groups in service development (Clarkson et al., 2003). Although broadening the scope of beneficiaries is an important dimension of inclusive STI policies, problems have been recognized related to a lack of competencies in knowledge co-production in inclusive processes as well as conflicts between organizational cultures and poor management of inclusive processes and policies (OECD, 2015). In addition, insufficient recognition of the contribution of bottom-up innovations for broader growth objectives (OECD, 2015) and problems in addressing inequalities within science itself (e.g., Koch, 2020) have been recognized as challenges. The dominance of certain groups can also endanger objectives related to equity and inclusiveness (OECD, 2015), and even the definition of innovation can be viewed in inclusive and exclusive terms, posing challenges for evaluation and international comparison (Cirera & Muzi, 2020).

Indeed, promoting inclusion as an STI policy objective doesn't come without challenges, with many of these being more acute in a developing country context compared to advanced economies (OECD, 2015). Value-based discussions are needed to clarify the role(s) of inclusiveness in the broad STI policy domain. Research highlights the rapid increase and dispersion of innovation policy objectives (e.g., Laasonen, Kolehmainen & Sotarauta, 2020). Inclusive STI policies are intertwined in complex webs of cross-sectoral and multi-level policy linkages, blurring the boundaries of STI policy goals. This may not always be a bad thing, but it requires new tools to coordinate, manage and evaluate inclusion as both a horizontal and vertical policy objective.

However, conceptual ambiguity related to inclusion can be harmful for goal-oriented STI policy development and evaluation and can result in decreasing the legitimacy of STI policies. As the innovation space is evolving rapidly towards users, free innovators and other actors in civil society (Gault, 2020; Kunttu et al., 2021), it is also relevant to ask who should be included and in what role, as inclusion and its evaluation also comes with costs – not everyone can be included in everything. An (over)emphasis on inclusive R&I processes might even lead to the diminishing of curiosity-driven research and innovation and result in weakening the role of research as a key source of innovation (Kalliomäki et al., 2022).

### **7.2.2. Diverse dimensions of inclusion in current STI policy debates**

As discussed, inclusion in the context of STI policies has been used in a wide variety of contexts, and common ways to approach it have related to social, economic and geographical forms of inclusion. All-embracing definitions leave room for multiple interpretations, which comes with both possibilities and challenges. In part, the vague and scattered use of the term is also related to its two-sided meaning captured in the definition of the Oxford Dictionary of English (2024) in which inclusion is either: a) the action or state of including or of being included within a group or structure, or a person or thing that is included within a whole; or b) the practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalized. Both dimensions of this definition – inclusion in the innovation process/system in general versus inclusion of the marginalized – are clearly present in STI policies today (see, Kalliomäki et al., 2024). On one hand, inclusion can be primarily seen as *a goal in itself*, and on the other hand, *as a means* of policies promoting the societal impact of STI.

In the US, the broader impacts criteria (BIC) framework adopted by the National Science Foundation (NSF) emphasizes inclusion as an important policy objective (Kalliomäki et al., 2024) and focuses on the question of who will benefit from the direct and indirect results of research, development and innovation (NSF, 2021). The spreading of the benefits of STI widely across society, with particular emphasis on marginalized groups, is also emphasized by the BIC

framework, as is the broadening of the base of STEM fields by harnessing the full potential of the US population by bringing in marginalized groups as students or staff. The goal also relates to promoting equality inside professions and organizations (e.g., Hofstra et al., 2020).

The EU's responsible research and innovation (RRI) framework views inclusion primarily as a tool to increase the societal impact of STI through inclusive, participatory processes (Kalliomäki et al., 2024). Inclusion of diverse viewpoints and expertise in co-creation and decision-making processes is seen as important in ensuring better correspondence with societal needs and the wider acceptance and adoption by civil society. Increasingly, the societal impact of STI has been conceptualized in relation to interaction and the better alignment of interests and mutually beneficial learning processes with the result that traditional assumptions of linear impacts have been replaced with an understanding of how it may emerge along impact pathways (e.g., Ozanne et al. 2017; Muhonen, Benneworth & Olmos-Peñuela, 2020).

Addressing the gender gap is one central area of inclusion as women are underrepresented in many areas of society, including many of the STEM fields, and despite recent progress, the gender gap persists and is particularly large in more senior positions (Holman, Stuart-Fox & Hauser, 2018). The gender gap exists in business, as well as in start-up companies, where the share of women among the founders and leaders is still very small. Altogether, very few companies are led by women, and they are underrepresented also in the boards of directors in the companies.

In developing countries such as India, Colombia and South Africa, inclusive innovation policy initiatives have related to both participatory processes and broadening the scope of policy beneficiaries, for example, through supporting grassroots innovators, innovations improving the access to basic services and the development of economically aligned social innovation policies promoting community empowerment (OECD, 2015). The need to support bottom-up initiatives is evident in several developing countries; for instance, in South Africa, regional innovation forums have been used to connect inclusive innovation initiatives to local policy agendas (see OECD, 2015).

Inclusion can be also viewed in active or passive terms (see Kalliomäki et al., 2024), with various actors and actor groups included in STI policies either as *passive objects* or as *active subjects* assuming their active agency for successful policy outcome. Both approaches are meaningful, yet they have very different implications for impact evaluation. For example, recruiting quotas and science communication are typical examples of approaches that do not explicitly assume active agency from target groups. These kinds of inclusive policies have been popular for decades, broadening communication efforts to diverse communities and allocating a certain percentage of slots for people from diverse marginalized groups (e.g., Hughes, Paxton & Krook, 2017). In addition, the gender balance is also increasingly accentuated in research and innovation policies and related funding instruments, particularly in the EU. In contrast, inclusive and societally impactful science and innovation often necessitate the active agency of diverse actors along R&I processes in order to accomplish desired impact. This view is accentuated in discussions on impact and translational pathways, which emphasize both the process-based view to impact creation and the active agency of participants and various stakeholders in these processes (Kalliomäki et al., 2024). For example, open access and data policies only have impact if the openness is utilized by active and diverse members of society. Active participation is also a prerequisite to impact in collaborative knowledge creation and innovation. In terms of evaluation, it can be argued that a better

understanding of active agency requires turning the focus towards the qualitative understanding of impactful learning processes.

### **7.3. Evaluation of inclusive STI policies – where at and where to next?**

In this section, we discuss implications of the evaluation of STI policies and a schematic framework is outlined that shows different approaches to inclusion that is intended to spark research and policy debates and steer evaluation practice. The framework presents four different dimensions to inclusion, combining inclusion as a means versus inclusion as an objective, and inclusion of active subjects versus passive objects (Kalliomäki et al., 2024). These different dimensions all require different approaches to, and competencies for, evaluation that may be disruptive to existing evaluation cultures (e.g., through increasing emphasis on formative evaluation [Molas-Gallart et al., 2021]). In order to provide a consistent starting point, various current approaches to evaluating inclusion as an STI policy objective are discussed below.

#### **7.3.1. Current approaches to evaluating inclusion**

Current policy instruments supporting inclusive innovation include financing for inclusive innovators; providing access to knowledge and expertise; regulatory frameworks such as market and product regulations and intellectual property rights; and additional policy approaches such as prizes and competitions and capacity-building efforts (see OECD, 2015). In addition, other main types of innovation policy measures include overall education and skills development, university-industry partnerships, support for small and medium-sized enterprises and international cooperation.

Traditionally, approaches to evaluating inclusion relate mostly to summative and quantitative efforts, with a relatively short-term focus on outcomes. Methods for understanding the impacts of process-based inclusion or long-term effects are not yet equally sophisticated, yet their importance is increasingly recognized (e.g., Sivertsen & Meijer, 2020; Spaapen & Prins, 2022). In the context of BIC, for example, traditional indicators include measuring the presence of students from underrepresented groups in STEM courses and majors and measuring demographic data for STEM faculty as well as hiring patterns by rank, gender, ethnicity, tenure and salary in universities (Campbell, Thomas & Stoll, 2009; Clewell & Fortenberry, 2009). In Europe, indicators include the volume of citizen science projects, percentage of women as project leaders, the share of research projects with educational deliverables and the involvement of the public in RRI policy development and policies (European Commission, 2015; see also Stilgoe, 2019). In addition, the inclusiveness of innovation can be also assessed through firm-level surveys aimed at capturing the nature of innovations, as well as through household data broadening the scope of innovation activities (OECD, 2015). In the context of developing countries, broad participation of both communities and researchers in inclusive policy-making processes is emphasized to enable the assessment of capabilities related to achieving set goals (Harsh et al., 2018).

Traditional approaches to evaluation may be viewed as rather isolated policy interventions within the STI policy domain, with current and largely outcome-oriented approaches to evaluating inclusion having limitations in the context of systemic policy (cf. Magro & Wilson, 2013). There is a clear need for not only painting a more comprehensive picture of inclusion as an STI policy objective, but also understanding its systemic and process-based nature as an object of evaluation. Alongside the increasingly complex and systemic evaluation environment, however, the narrower

and linear approaches are by no means irrelevant for understanding the multiple dimensions of an initiative as not all policy measures are broad and complex. Policy evaluation comes with costs, and it is important to recognize the challenges related to existing approaches, such as difficulties in evaluating the impacts of non-technical or non-commercial innovations, and the costs of evaluation in small-scale projects that are particularly relevant to the inclusive innovation domain (OECD, 2015).

#### **7.4. Towards a comprehensive framework for evaluating inclusive STI policies**

In this section we outline a framework of different evaluation approaches that can be used as an analytical tool to spark research and policy debates and steer evaluation practice. The framework doesn't capture all possible approaches to evaluating inclusiveness, nor does it attempt to do so: the purpose is to build a structure that can generate further debate in this constantly evolving field. The framework builds on the previously presented dimensions of inclusion as a means versus inclusion as an objective, and inclusion of active subjects versus passive objects (Kalliomäki et al., 2024), as these dimensions have very different implications for evaluation. For example, there is a need to better capture the qualitative impacts of inclusive processes, which have not been sufficiently understood due to evaluation cultures favoring summative approaches, as well as short-term and thus often linear understandings of impact (e.g., Magro & Wilson, 2013).

Evaluating inclusion as a means suggests that the process itself is important. In addition to understanding and evaluating the outcome of the process, evaluating the effectiveness and the impact of inclusive processes themselves becomes the target of evaluation, requiring a formative approach (Molas-Gallart et al., 2021). This requires collecting qualitative data concerning the learning in inclusive processes and what the inclusion of certain actors to the R&I processes enabled. As inclusive processes focus on the increased societal impact of STI policies in very different contexts, this necessitates an acceptance that approaches to understanding and evaluating interactive processes must be different as they vary greatly between diverse fields (e.g., Sivertsen & Meijer, 2020).

Instead, evaluating inclusion as an objective directs attention to the end result and its inclusiveness. In these cases, the inclusion of certain underrepresented groups, such as gender, racial and sexual minorities, may be accessed via quantitative and descriptive approaches to evaluation. As discussed, typical evaluation indicators are quotas, and the overall representativeness of diverse societal groups in STI-related activities and organizations. In addition, geographical inclusion has been typically evaluated through geographical coverage and equal distribution of various policy measures.

Approaches based on evaluating inclusion through coverage are often based on passive approaches to agency, viewing actors, organization or regions as objects of inclusive policies. Assessing the inclusion of these diverse societal groups as objects of policy points towards traditional approaches to evaluating inclusive innovation, focusing primarily on the inclusion of poor and marginalized groups and communities. These approaches, giving also symbolic recognition to various marginalized groups, are important in attempts to strengthen inclusion in various sectoral and societal contexts and through several SDGs. However, formative approaches to evaluation that recognize the active agency of included actors as important parts of the impact-creation process and

implementation of policies are increasingly needed. Evaluating the active agency of included actors necessitates paying attention to their contribution and learning through inclusion. Furthermore, attention turns to understanding the varied impact pathways that emerge from the constantly evolving processes of interaction, which need to be assessed as part of broader systemic transformations (Molas-Gallart et al., 2021). These different dimensions are summarized in Figure 1. The key message is that different dimensions of inclusion require different evaluation approaches, which are also partially disruptive to current evaluation cultures.

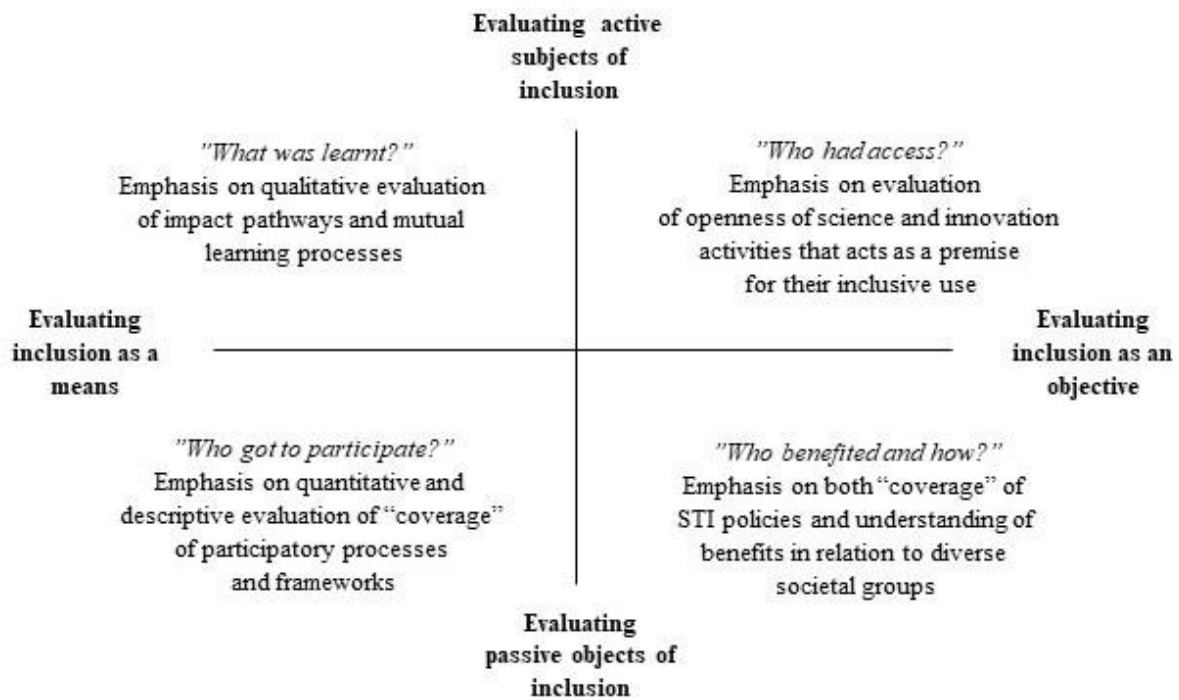


Figure 1. A schematic framework for approaching the evaluation of inclusion as a multidimensional STI policy objective (Source: Authors, building on Kalliomäki et al., 2024).

Depending on the context of evaluation and application, the framework directs attention to the need to broaden perspectives when it comes to understanding and evaluating inclusion as a multidimensional STI policy objective, considering its current use. Importantly, its use in both research literature and policy language extends beyond the traditional framings concerning poverty reduction and the benefits for different marginalized groups (e.g., Harsh et al. 2018; Mortazavi et al., 2021). When it comes to the more disruptive parts of the framework, a total rethinking of approaches may be required, with improved tools to better understand the impacts of, and on, agency and learning. Furthermore, inclusivity is promoted through various intertwined sector policies, which increases complexity from an evaluation perspective and necessitates better understanding of policy interfaces (Kalliomäki et al., 2022).

The example questions in Figure 1 are presented in the form of ex post evaluation focusing on understanding the impact of past performance, but they can be asked also ex ante projecting future impacts, turning attention towards impact management. In addition, increasing emphasis on formative assessment directs attention to "rolling" evaluation during the implementation of processes (e.g., Molas-Gallart et al., 2021). Altogether, the temporal aspect in evaluating the versatile impacts of inclusive STI policies is important as there might be tradeoffs between short-

and long-term time horizons. Short-term emphasis on inclusive research processes might be harmful to innovativeness in the long run if academic freedom and curiosity-driven discovery are stifled by rapidly increasing and uncoordinated stakeholder interaction and co-creation. In this context, inclusivity might be inadvertently promoted at the expense of innovation. Furthermore, applied evaluation mechanisms also need to leave room for learning from experience and mistakes, making institutionalization of learning a highly important evaluation component in the increasingly complex and systemic policy-making environment (OECD, 2015).

In addition, the framework sheds light on the different competencies required to evaluate inclusiveness as a multidimensional STI policy objective. Once inclusion as a policy objective becomes increasingly emphasized, efforts need to be made to increase evaluation expertise relating to different dimensions of inclusion that go beyond traditional approaches and their primarily quantitative and descriptive evaluation. As a result, increasing attention needs to be directed to qualitative competencies related to understanding impacts of long-term interactive processes that require constant reflection of impacts and the directions they take. There is also a need for contextual sensitivity as well as different kinds of evaluation mixes depending on the particular needs of a given policy space (e.g., Bustelo, 2006; Magro & Wilson, 2013). One concrete approach to a complex evaluation situation involving multiple policy instruments is to look at the situation through a territorial lens, considering relevant contexts for inclusive STI policy evaluation, e.g., in an urban or regional context, where different sector policies are brought together that promote inclusivity from different perspectives (see, e.g., Magro & Wilson, 2013). Another obvious yet often neglected approach is to seek support to inclusive policy and related evaluation design from outside the well-known players, e.g., from excluded and lower-income groups and non-governmental organizations who may have better knowledge on everyday challenges (OECD 2015). As a result, broad stakeholder engagement from the start should be a rule rather than an exception in inclusive policy design (e.g., Spaapen & Prins, 2022). In the context of research evaluation, this means also recognizing the role of stakeholders in assessing research quality (Franssen, 2022) with the risk that exclusive research design and framing may narrow the scope of potential benefactors from the outset (Kalliomäki et al., 2022).

## **7.5. Conclusions and future directions in evaluation research and practice**

This chapter has explored the increasingly versatile meanings of inclusion as an STI policy objective. In addition to traditional dimensions of inclusion related to social, economic, geographical and cultural aspects, those related to agency and the process-based and systemic nature of inclusion are increasingly emphasized in current STI policy debates. The chapter has also sought to shed light on the challenges arising from this multidimensionality and related conceptual ambiguity, which can erode the legitimacy of inclusive policy-making. To move from evaluation theory to practice in increasing inclusiveness as part of STI policy-making, value-based debates are necessary in contextualizing inclusion as an STI policy objective in different geographical and societal contexts. Alongside societal and geographical contexts of the poor and marginalized, inclusivity increasingly refers to process-based interpretations that relate more broadly to diverse societal stakeholders. As a result, the rapidly evolving STI policy sphere needs to clarify the scope of inclusive policies in order to retain focus on policy goals and promote inclusion as a society-wide cross-cutting mission. STI policy itself includes a wide variety of approaches that have a different relationship to inclusion and the dimensions presented in Figure 1, including supply-driven,

demand-driven, user-driven and mission-driven approaches to innovation. However, it is important to recognize that STI policy cannot tackle all challenges related to inequality, and discussions concerning how best to build synergies horizontally with other policy sectors are equally important to avoid coordination failures.

Considering inclusivity from a narrow policy versus broader societal perspective is linked to wider systemic debates characterizing mission-oriented and transformative innovation policy development, where complex and long-term societal transformations can only be modulated but not controlled by systemic policy experiments. For evaluation, recognizing these limits indicates that attention needs to shift increasingly towards formative assessment, learning and continual path reflection towards systemic change (Molas-Gallart et al., 2021). In addition to seeking external accountability from funders and decision-makers, then, participants in inclusive policy practices and processes need to be recognized as integral parts of evaluation processes (OECD, 2015). In addition, systemic approaches are needed that synthesize the lessons of numerous existing evaluations (Edler et al., 2016).

In addition to this systemic approach, the scalar perspective in evaluation is important to understand the breadth and depth of inclusiveness as a policy objective. Attempts to improve vertical coordination involve an awareness of multi-level governance as the lack of coordination across levels can water down impacts of innovative initiatives (OECD, 2015). This also relates to differentiating between policy- and project-level evaluation (Kalliomäki et al., 2022). Innovations are increasingly developed in an international context, which is also an important scale for international cooperation and policy learning in inclusive innovation. Yet inclusion also needs to be considered in national and regional contexts, where marginalized groups may be better considered in innovation policies and processes at the interface of other policy sectors. Hence, moving beyond national-level governance also towards regional and local contexts is important, especially as inclusive policy initiatives aim to build support for bottom-up agency, appropriate actions and related impact evaluation mechanisms. When successful, place-based initiatives can then be scaled up with the help of their original communities so as not to lose touch to the initial success factors related to the initiative, even though these processes come with caveats inevitably involved in scaling up tacit knowledge (see OECD, 2015). The interface between innovation and urban and regional policies is important as cities can act as a platform for concrete policy measures close enough to citizens' mundane challenges. Using a spatial policy lens as an anchor for coordinating diverse intertwined policy impacts has indeed been suggested as a practical approach for building tailored policy mixes sensitive to systemic policy impacts (Magro & Wilson, 2013). The increasing need for policy experiments (Molas-Gallart et al., 2021) should also enable the exploration of possibilities and challenges related to the spatial approach to coordinating and evaluating systemic impacts on inclusion.

In sum, different approaches work in different situations, as summarized in Figure 2. From the perspective of narrow versus wide understanding of scope and impact: the vertical axis captures the scope of the objective, whereas the horizontal presents the narrow and wider understandings of policy impact. Clearly, future research increasingly needs to consider the bottom right corner, where systemic understandings of impact meet society-wide missions related to inclusivity whilst recognizing that the linear and systemic approaches within the context of the STI policy framework are useful for "keeping eye on the ball". In conclusion, then, coexistence of these different approaches is needed to understand impacts in both narrow and wider terms.

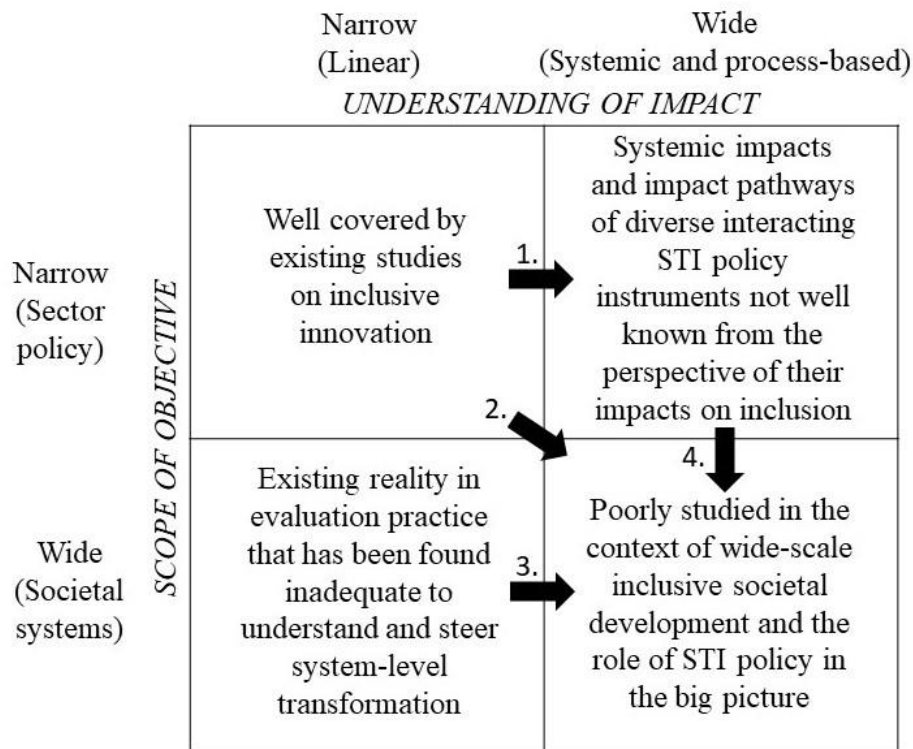


Figure 2. Mapping future research directions for evaluating inclusion as a multidimensional STI policy objective (Source: Authors).

To conclude, the arrows in the Figure 2 present an ambitious research agenda for both STI policy scholars and funding institutions interested in promoting inclusion both within the scope of STI policy or more broadly amidst wider societal problem-solving:

1. Firstly, within the STI sector policy context, focus of research on inclusion needs to shift from a linear understanding of impact towards more a systemic and process-based understanding of impacts on inclusion, however, keeping in mind that not everything is broad and complex.
2. Secondly, lessons from numerous studies dealing with inclusion from the perspective of individual policy instruments, and evaluations based on a narrow scope and understanding of impact, should not be forgotten but instead synthesized for the benefit of broader system-wide understanding and hence a more informed evaluation practice.
3. Thirdly, existing critical debates in evaluation theory concerning the linear understanding of impacts needs to turn towards constructive debates about viable alternatives and directions in evaluation research.
4. Finally, system-level debates concerning inclusion within the already broad STI policy domain need to be connected to system-level debates concerning inclusive societal development in general, hence building bridges to other sector policy contexts also dealing with increasing pressures to increase their inclusiveness. Future research should try to improve understanding on the possibilities and limitations of systemic STI policy within the wide-ranging societal attempts to increase inclusion, which are visible also in several different SDGs.

The frameworks presented in this chapter can be used to organize thoughts in advancing evaluation theory. Furthermore, they can be useful in generating debate of the required next steps in the rapidly growing research field – a field that is very much motivated by the practical needs to find solutions to increasing inequalities worldwide. Finally, ideas presented in the chapter should also contain practical value through conceptual impact and diverse policy and practice implications.

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