

Exploring paths for epistemic diversity in innovation policy: first steps for a quest

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Abstract

This paper discusses conceptual reach of Innovation Systems approach (IS) at the core of innovation policies and discusses concepts about alternative views to tackle the challenges of epistemic diversity in *multicultural countries*. This alternative view builds concepts such as Ecologies of Knowing (EK) and Knowledge, Research and Innovation System (KRIS).

It is argued that IS approach poses risks as an analytical tool in multicultural contexts, regarding its underlying disciplinary backgrounds and its impact as heuristics for policy-making. The paper proposes an alternative view attempting to realistically aboard the structure, dynamics and governance of knowledge, research and innovation in multicultural countries.

Keywords

Epistemic diversity – Innovation Systems - Knowledge Research and Innovation System – Ecology of Knowing – Policy

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Introduction

This paper discusses innovation systems in the light of multicultural sociotechnical landscapes. The discussion is set on the hypothesis that it is the heuristic—and not the object—what fails when discussing knowledge governance in these countries where the techno-scientific economic model (Hornidge, 2011) does not play the sole relevant knowledge source. Other knowledge' features, roles, sources and societal implications should be addressed as well.

The matter is pressing, for it is known science, technological and innovation heuristics pose a relevant reference for policy making (Kuhlmann & Arnold, 2001; Lundvall, 2017). In some contexts, where diversity does not necessarily imply epistemic diversity, this theory-policy dialogue appears to reflect a smooth coupling, the challenge posing perhaps tensions embedded on techno-scientific appropriation (Stirling, 2008). Taking the *Knowledge Society Seriously* (Felt & Wynne, 2007), a report commissioned by European Union, poses a good example. The report asks for spaces for deliberation and diversity in the societal relation to science and technology, but it does not question its relational foundational assumptions: Modernity is a Eurocentric invention.

In other contexts, the theory-policy link looks rather disruptive. Scholar work assessing innovation systems in developing countries - where epistemic diversity is most often part of the landscape- refers one time and another to figures of speech such as missing pieces, failures, deaf dancers and gaps (Lundvall, Joseph, Chaminade, & Vang, 2011). At its best, literature reflects on national innovation systems, social inclusion and development (e.g. Dutrénit & Sutz, 2014). Common frameworks of development practices are taken here into account (e.g. Sen, 1999), to critically or creatively reflect on possible causalities between innovation practices and various forms of social exclusion.

None of these approaches take the problem of epistemic diversity into account. Both literature inform about innovation policies, and innovation policy itself, keep posing a mirror in which the real object stands at odds. Distance to the object, we argue, risks epistemic violence as a form of exclusion. Moreover, persistence of this approach might hamper transformative efforts if it fails to address epistemic diversity. Cummings et al. (2017) note how perspectives on knowledge within the sustainable development goals, despite its transformational vision, still focus on a techno-scientific-economic discourse at the expense of what they call a participative-pluralistic approach. Such an approach, it is argued, would better accommodate the role of indigenous and local knowledges regarding the nature and implied challenges of sustainable development goals themselves.

This paper takes a different stance. Rather than drawing on the shortcomings of policy

challenges of innovation systems in multicultural countries it will reflect on underlying rationales of innovation systems literature, unveiling the reason why it falls short to address epistemic and institutional diversity. Hence, the paper will follow a basic structure, introducing at first briefly some limitations of SI concept, while discussing complementary concepts that can help to understand better alternative knowledge dynamics and possible post-developmentist performances. It will introduce the literature from Latin-American critical thought, with the aim to elaborate on what would be more accurate lenses for multi-cultural landscapes. Consequently it will be presented a controversy between SI as Policy and SI as heuristic of governance. Secondly it will discuss epistemic diversity face to the SI concept, and finally a reflection around addressing epistemic blind spots in SI concept

Innovation Systems literature in the light of multicultural societies

As a means of clarity, we will describe innovation studies scholar body as a complex with two opposite extremes. On one hand, so-called organizational innovation studies, focus on management, organization and business. On the other, economics of research and development, focused on economics of innovation. In the middle of these opposing fields of study, we can find the specific realm of innovation systems, as a body sharing both types of concerns from a social science perspective (Fagerberg, Fosaas, & Sapprasert, 2012), mostly focused on the meso to macro level. Despite that Schumpeterian ideas underlie this set of literature (Fagerberg, 2003), innovation system approach is featured by evolutionary ideas, building on assumptions different to those of neoclassical economics and growth-theory paradigms.

The evolutionary perspective in economics of innovation extrapolated to innovation systems seems to borrow Darwinian principles as a metaphor to explain given dynamics amongst firms, suppliers and consumers in a given economy. Some of these borrowed elements are the genes, species, mutation, natural selection, and retention that can be understood respectively as routines, industries, anomalies, market/institutional frameworks and conditions for organizational learning. In that order of ideas, it looks like that body of literature would assume that i) variations on the firms of a given industry are inherited, and those variations are conditions of variety; ii) the amount of reproduced small companies are more than those that could perish; iii) diversity generates variety; iv) just those firms being able to adapt to the environment can survive; and v) just positive variations in firms are kept (Gulbrandsen, 2016). It is not part of this paper to explain the problematic affair that this extrapolation imply, but it is worth to draw the attention about it in order to show how probably is constituted the discursive regime of innovation systems as a mechanic governmental heuristic that overshadows the complexity of the thinking around

governance of knowledge in the south.

Ideas related to the power of monopolies and the race for investment in R&D and patents, as well as those related to technological determinism have been relatively put apart. Those of technological change, learning and evolution via systemic interaction of the actors have had further development. The Schumpeterian assumption of path dependence has been kept to give an important role to the cumulated knowledge base in determine territory, sector or industry. Nelson and Winter (1982) as well as Lundvall (1992) contributed strongly to change the perspective about flawless markets, featured by rational actors dealing exclusively on their benefit. They introduced the notion of bounded and procedural rationality, one conditioned by rules and delimiting the processes and structure of the markets. Given a practice of organizational learning, firms commit here to improve their technologies following an institutional framework. So, in this case innovation would be depicted as a product of both external and internal forces following a set of complementary rationales coming into governance settings.

These works introduce a change of perspective, from an orthodox linear model of innovation to one systemic model allowing to boost national and regional economies or sectors and technological fields. Yet, and in spite of the SI concept being understood as a public-private network of institutions whose interactions foster, initiate, modify and diffuse new technologies (Freeman, 1987), one has to consider that the underlying rationale of avoiding capitalist stagnant is still pervading on this view. In short: despite the common use of the word system, SI has barely touched the boundaries of modern thought.

This might explain why this heuristic expose conflicts when it comes to discuss empirical realities of so-called developing countries: in such countries, there is place--and a need--for diversity outside the current contemporary capitalist system. The IS approach is fundamentally at odds with neo-classical economic theories of growth in such countries (Feinson, 2003), but its current heuristics are not sensitive enough to address the structure and governance challenges of countries posing motley socio-technical dynamics based on epistemic diversity. It is a fact that post-colonial societies describe multi-cultural societies marked by the coloniality's patterns, and the reach of this matter should not be dismissed.

Critical thought, building on decolonial and post-developmental scholar work, has come to a notion of epistemic diversity labelled as 'epistemologies of the south' those describing societal groups in which western rationales are not dominant, and whose forms of knowledge often are dismissed as innovation and transformation forces. The bottom line for epistemic diversity is that it appears as a starting point, not as a goal. And that this imperative should reflect on replacing

the monoculture of western knowledge by an understanding of an ecology of knowing (Garcia Chueca, 2014; Santos, 1997, 2002, 2006, 2007, 2009, 2010; Santos & Meneses, 2014). Following this thread, the assumption behind this paper is that the SI is an incomplete analytical tool to understand in a realistic way the economic, political and cultural subtract in some societies, and that further nuances are needed in order to better understand the role of knowledge and innovation (and policies) in such societies, and it will worth to take them into account for the possible transformation of the knowledge governance models of the western world.

SI as a practice policy vs. SI as a heuristic object

SI presented as a given-object, as a “fact” to be studied (Godin, 2010) founded on innovation studies and economics of innovation (Lundvall 1985,1992; Freeman 1987; Freeman and Soete; Nelson 1993; Fagerberg, Mowery and Verspagen 2009) represents a methodological problem.

This approach has had a significant worldwide acceptance within circuits of academics and policymakers. This acceptance might be oblivion concerning SI roots as a concept. Arguably, this is a result of the role SI plays as a heuristic allowing to address the intertwined thread of theory, practices and policy making relationship related to the governance of knowledge and innovation in territorial and sectoral fields (Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007; Kuhlmann & Ordóñez-Matamoros, 2017). This is, acting as a model in which theory, here a boundary object, becomes a performative object when embedded into policy (Van Egmond & Zeiss, 2010).

We think the fact that IS is presented as a given object is relevant in the sense that it simplifies knowledge, innovation and governance dynamics as a set of “snapshots”(Fagerberg et al., 2009). Some literature shows, for instance, as a collection of metaphors of incomplete objects missing pieces and functions: in that sense IS appears to play role as a static-useful-conceptual-construct to think and intervene, activities, capabilities, institutions, and structure of STI composition of a given object of knowledge government (sectors, technological field, territories). There are some scholars providing heuristic, but "objectualist" perspectives, such as Kuhlmann and Arnold (2001); Schmoch, Rammer, and Legler (2006) among others: these works use SI concept as rather an “heuristic” to understand the governance of the sociotechnical dynamics on a determined context, and its infrastructures; educational and research systems; knowledge market; political-institutional conditions; actors who mediate between those “spaces”, and the co-evolution of all those elements. Here the notion appears to be useful as a tool of thought and

intervention of functions and parts of the dynamics and trajectories of the governance of knowledge and innovation. Despite this, the work of Chaminade and Edquist (2006) would raise the case in favor of SI as an imaginaries inasmuch they are difficult to translate into real policymaking, which is in our opinion more realistic, as well as, is the case of Wicken (2009) work, who with a historic approach provided a perspective about the configuration of SI as a juxtaposition of industrial-path-layer. Those perspectives show two different non-instrumental nor objectualist versions of IS. First one open the opportunity to think in IS as an imaginary shared way of governance of knowledge and sociotechnical change, it means as a "style of thought", and the second one, as a socio-historical and technological construction. That opens alternative ways to analyze and intervene sociotechnical change dynamics in a certain field, sector or territory.

SI and Epistemic Diversity

Diversity has not been explored in innovation studies, except for a notable contribution. Drawing on a multidisciplinary review on the concept of diversity, Stirling (2007) brings about conceptual and methodological tools to assess diversity in innovation systems. However, he does not address the problem of knowledge at the boundaries of the techno-scientific body.

The SI conceptual base appears not to be sensitive to embody, non-modernized, practice-based-knowledges: those often labeled as indigenous, local or traditional knowledges. This limitation is normal (and has been normalized) in the modern-western mindset. This has been noted by Latin American critical thought from the 70s (Fals-Borda & Rahman, 1991) to our days (Santos, 1997, 2002, 2006, 2007, 2009, 2010; Santos & Meneses, 2014). SI focus on interactions between organizations, routines, firms, industries, institutional frames and public and private spheres. From this point of view SI appears to have built a rather acritical body.

Ideologies, values, beliefs, and a varied stock of knowledge practices as objects of governance in multicultural countries have been addressed elsewhere. Mainly by means and actors coming from different avenues of development practices. The Unesco's world report on knowledge society (Bindé, 2005) poses an example of inquiry consistently addressing the challenges of epistemic diversity. Works as those of Ferreira (2012); Ferreira Sebastiao and Marcos (2005) reflect from practice on the place of local and indigenous knowledges in development efforts. These texts as well as the myriad cases they build upon, often pass by the side of innovation policies. Yet, these spaces constitute innovation-niches, policy blind spots, taking place at the other side of the modern-epistemological-pitfall, following purposes different to those of the evolution of the system or economic growth.

Which poses the challenge of bringing to the fore heuristics allowing to address governance dynamics of knowledge, research and innovation in such environments, taking into account its complexity: not just as “postcolonial territories”, but as social, spatial and imaginary places where cultural, epistemological and temporal horizons are permanently in dispute as a result of the long imposition of western techno-science as an overshadowing mindset: one that eliminates, invisibilizes, suspends, and corrects non-universalistic, sensitive and intuitive shapes of knowledge whose innovative potential ends up domesticated.

These limitations imply a deep reflection about the transduction effects (Thomas and Dagnino, 2005) of the SI as a conceptual tool. It means the self-organized process of alteration of meaning that appears when the concept travels from one context to another with at least two consequences: first, encrypting the complexity that there are different possible IS as possible wide-involved-interests in the modulation of the development economy model; second, overshadowing the origins of knowledge racialization and--probably built on ignorance--promoting epistemic violence by overstressing the supremacy of science, technology and innovation as engines of modernization, progress, development or any other civilizatory discourse.

Addressing epistemic blind spots: An embryonic alternative view

In order to go one step beyond in conceptualizing SI for multicultural contexts, we propose exploring two complementary threads. The first comes from South thought and later reflections on development. The second builds on innovation systems thought.

We will discuss first the line of Ecology of Knowing (EK). This concept coined and broadly used by Bonaventura de Sousa Santos takes as an explanatory departure point the idea that all knowledges are incomplete, and deserve to be completed to some extent. Such knowledges are always inter-knowledges (Santos, 1997, 2002, 2006, 2007, 2009, 2010).

Ecologies of Knowing are characterized by i) non-exhaustible epistemological diversity; ii) radical co-occurrence and symmetry of knowing; iii) ignorance is not a departure point, but an ending point; iv) internal exploration of plurality of science; v) intercultural translation as a way of reciprocal intelligibility; vi) knowledge as practice more than an interpretative tool of reality; and vii) contextual hierarchization of knowing. It means, a need to prioritize knowledges face to specific problems or circumstances ensuring the participation of those directly affected by determined circumstance (Garcia Chueca, 2014). The inclusion of this understanding into the innovation systems perspective changes the general comprehension of STI and its governance in multicultural contexts where it has been appropriated to the IS approach. Knowledges and

innovations, specially all of these normally invisible for STI policymakers and often called as indigenous, practical, local and so on, could be recognized and valued as innovative and transformative forces.

This concept aims at reaching a comprehensive view of different knowledges, the coexistence of epistemologies, it's possible diverse ontologies, and the sociotechnical-border-practices where western STI could even be conducted by that that the Aymaran sociologist Silvia Rivera Cusicanqui calls 'chi' ixi epistemology'. This epistemological formation describes a motley, unpure and stained worldview. It is a type of promiscuous dialectic-thought without a synthesis where *mestizo*, the mixed subject, is able to recognize herself without shame of epistemological impurity. This is, in Latin America, a scientist, technician or bureaucrat who can understand its European legacy and its indigenous legacy, the separated-yet-together *epistemes* and matrixes of understanding. This Latin-American 'expert' is the result of a double subjectivity which experiment a permanent internal-struggle of a double knowing-legacy. By one hand, scientific and rational one, as well as, intuitive, emotional and exploratory one.

Reflection about the Ecology of Knowing brings about again the discussion about democracy into innovation studies (Freeman & Soete, 1997) referred to the genesis of the debate to the social mechanisms for stimulating, monitoring and regulating innovation. EK can be the key stimulating, monitoring and self-regulatory entity of innovation: multiple epistemologies and negotiations about ontologies in action taken into account as a policy matter into the heuristic frame of IS.

The second thread builds on Knowledge Research and Innovation Systems (KRIS) as a later way of thinking about IS (Kuhlman & Rip, 2016; Rip & Larédo, 2008). This concept is more explicit on the extent of how innovation systems should not limit knowledge production to professional scientific knowledge production, but include other modes of knowledge and innovation as well. This is happening already, for instance, by reckoning experience-based knowledge as a legitimate source. Nevertheless, the boundaries of scientific knowledge are still strongly guarded, and this could be a problem in the so-called developing countries. This altered version of innovation systems stressing a heuristic point of view to think what could be doable on Global South dynamics (Rip & Delvenne, 2014; Santos, 2009). KRIS understands STI policy-making and their implementations as a part of the governance-interaction without preponderant agency, it includes new constellations of actors and concertation-spaces such as innovation collectives or spaces of knowledge-confluences. As means of an example: innovation collectives not only, but normally, work on the interstice between art and techno-science, and they can be found most of the times in media-labs or alternative cultural venues. KRIS is able to show in a systemic and understandable way the interactions between professional-scientific-knowledge production, and

other practices and modes of knowledge production, re-opening the concern about the quality of knowledge (produced and used) beyond of the shared quality criteria established by science (Rip & Delvenne, 2014; Rip & Larédo, 2008). In this sense, KRIS approach broadens SI reach, although KRIS implicit tensions in its governance have not been translated in a fully-fledged view.

Drafting a conclusion: questions to continue the quest

Has been proposed EK and KRIS as two complementary concepts to SI approach in Latinamerican countries. Due the complexities of the region, this paper set a discussion to reflect about the role of non-scientific knowledges and the relevance of taking into account as policy subjects the epistemological diversity; symmetry of knowing; internal plurality of science; double subjectivity of scientist; relevance of intercultural knowledge translation; practice-turn of knowledge; and contextual hierarchization of knowing. It is proposed an alternative perspective of innovation systems in multicultural scenarios going beyond structures, functions, limits, dynamic capacities and capabilities, going into, as we call, 'blind spots': epistemic and ontological diversity, values, beliefs, ideologies and discourses.

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