



Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Foresight for shaping national innovation systems in developing economies

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ARTICLE INFO

Keywords:

Foresight
 Parallel foresight
 Multilevel foresight
 Innovation systems
 Inclusive development
 Research and innovation policy

ABSTRACT

The definition of an effective innovation policy is a major challenge in developing countries, a task that has become more complex as increasing attention is being paid in policy issues to inclusive development, raising quite different requirements for what an innovation system should deliver, and how it should therefore be organised.

It is argued that foresight is an appropriate instrument to shape innovation systems and support policy-making processes, thus, foresight has attracted interest in developing countries. However, the ability to effectively exploit its results is hampered by the limitations of their governance systems to take into account the complexity in the definition of public policies. In such a context, foresight needs to be more thoroughly integrated into the policy making process to be effective.

Attempts to engage excluded indigenous or poor peasant, communities in development plans have also been made and in this context, foresight activities in these communities have been conducted, but the consultations have not been strategic and forward-looking enough to connect to policy-making beyond the specific local settings.

In this paper, we propose a novel interconnected multilevel approach containing two elements of policy making to support innovation for inclusive development: a) the close interplay between foresight and policy making, and b) the linking of local community-level to national level foresight. Such an approach is well suited for using foresight to inform and guide policy to frame the national innovation system that can attend both economic and social development goals.

1. Introduction

It is well established that the innovation system approach is a useful framework to define effective policy interventions (Soete et al., 2009). The approach has been extensively used by industrialised countries for about two decades mostly in line with the ambition of enhancing competitiveness through innovation. The innovation system approach has also been influential in developing countries to guide debates about industrial development and innovation policies, but adapting it to the conditions of these countries is far from straightforward.

Most industrialised countries can draw on a consolidated basis of scientific institutions and a specialised industrial tissue, conditions that are often not given in developing countries. Moreover, as pointed out by Arocena and Sutz (2005, 2012), for developed countries the approach is a descriptive ex-post concept constructed on the basis of empirical findings, while in developing countries it is an ex-ante concept and has an important normative weight.

Also in developing countries, increasing attention is being paid in the political discourse to inclusive development. This has led to the questioning of whether or not the innovation system approach is still a useful framework for policy making in these countries (Iizuka 2013).

Accompanying the different visions that exist around these latter issues, work is being conducted on research and innovation policy for inclusive and sustainable development, but is still in its early stages (Dutrenit and Sutz, 2014). The Latin American Network for Economics of Learning, Innovation and Competence Building Systems (LALICS) (www.lalics.org) is now engaged in the analysis of these issues and the Global Network (GLOBELICS) (www.globelics.org) has dedicated a full International Conference in 2015 to them.

In the past years, several proposals have been put forward to use foresight as an instrument for improving the performance of innovation systems. Martin and Johnston (1999) have argued that foresight is a powerful tool for 'rewiring' and thus strengthening the systems in terms of their capacity to learn and innovate. Central to their argument is the recognition of the vital importance of interactions between actors

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Received 9 October 2015; Received in revised form 17 November 2017; Accepted 24 November 2017

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making up the systems, an argument pointing out that foresight offers a meaningful way to stimulate, extend and deepen those interactions.

Martin and Johnston (1999 p.48) in their comparative study of developed economies, consider that the application of the foresight process has substantial benefit that can be captured in terms of the 5Cs as proposed earlier by Irvine and Martin (1984) and Martin and Irvine (1989):

- Enhancement of Communications among companies, among researchers, and between researchers, users and funders.
- Greater Concentration on the longer-term future.
- Means of Coordination, among researchers and between researchers, users, and funders.
- Creation of a given level of Consensus on desirable futures over the next 10–20 years
- Generated Commitment to turning the ideas emerging from the foresight programme into action.

Smits and Kuhlmann (2004) have extensively discussed the use of systemic instruments in innovation policy, including foresight. On the other hand, Andersen and Andersen (2012) and Weber and Schaper-Rinkel (2017) have analysed how the innovation system framework can contribute to foresight, and have further explored the co evolution of innovation studies and the practice and concept of foresight, concluding that the concept of innovation system foresight (ISF) constitutes an improved integration of the contemporary understanding of innovation into foresight (Andersen and Andersen, 2014).

Havas et al. (2010) have analysed the impact of foresight on innovation policy by studying outputs and outcomes in the experience of more developed economies, and Da Costa et al. (2008) have analysed in depth the impact of foresight on policy-making.

Foresight has also been conducted in local communities mainly with the objective of eliciting their opinion on the use of natural resources or the construction of large infrastructure projects, as required by environmental legislation of most countries.

Against this backdrop, we suggest to explore the use of foresight in developing countries as a mean to reconcile the ambitions of enhancing both competitiveness and inclusive development through innovation. This represents a formidable challenge for many of these countries. Our exploratory work is inspired by multi-level thinking in innovation research and in innovation policy, which aims at integrating innovation activities at the micro-level of niches and experiments with structural and institutional changes at meso- or even macro-level.

This kind of thinking has become quite prominent in recent years, both in innovation systems research (for a review, see Weber and Truffer, 2017) and in research on sustainability transitions (Berkhout et al., 2010; Geels, 2002; Kemp et al., 1998). Some first efforts have also been made to translate multi-level concepts of innovation and change into forward-looking methodologies (Elzen et al., 2004) but not yet in relation to emerging economies and matters of inclusive development. Co-evolutionary and multi-level thinking is also a core element of multi-level governance approaches in innovation policy, which stress the importance of coherent policy action at different levels, and of the necessary orchestration processes to achieve this coherence (e.g. Smith et al., 2010).

Considered a useful policy instrument, foresight has already attracted interest in emerging and developing economies of several Latin American, African and Asian countries. In the former, there is evidence of a growing number of efforts to develop it. Cordeiro (2016) has registered the foresight experiences in 13 countries of Latin America, and more recently, Elahi et al. (2013) has described one large scenario construction in Africa. Some of the larger developing countries have conducted extensive foresight studies for policy making (Cuhls et al., 2015).

In spite of such efforts, in most of these countries, the ability to effectively exploit foresight results is hampered by the inability of the

respective governance systems to take into account the complexity in the definition of public policies that foster and strengthen indigenous capabilities to use, adapt, modify or create technologies and scientific knowledge. There are several conditions that need to be fulfilled for policy to deliver, one of which is governance. Ahrens (2002) points out that the lack of good governance is the main reason behind the difficulty of policy implementation and the build-up of S&T capacities in developing countries.

On the other hand, Albornoz (2008, p.131) point out that “not only the effectiveness in the use of FTA methods on policy depends on the quality of the studies produced, but also to a large extent, on demand for these studies by decision makers”. To generate such demand it is necessary that foresight develop new approaches to attract policy makers in developing countries.

Against this backdrop, this paper proposes a novel foresight approach that allows combining foresight and policy making as parallel but interlinked processes and adopting a multi-level perspective that connects local community engagement with national policy processes, both at the same time.

The parallel foresight process being proposed here is expected to contribute to strengthening governance, by reversing the existing lack of coordination that weakens the system in developing countries. We aim to show that that it is possible to use foresight to inform and guide policy to frame the national innovation system that attends both economic and social development goals.

The paper is conceptual in nature, but also describes the results of the application of the novel approach in the specific case of the definition of the long-term national plan for the development of science and technology of Vietnam (Aguirre-Bastos and Weber, 2012).

2. Building blocks of systemic innovation policy for inclusive development

2.1. Innovation systems and policy making in developing countries

Policy making in science, technology and innovation in the developing countries has taken place for several years.

Sagasti (2014) while reviewing the role played by the Science and Technology Policy Instruments Project (STPI) conducted in the early 70's, has provided a picture of policy making practices in a set of developing countries over the past 40 years. The STPI Project, that has been considered very successful (Oldham, 2014), produced a large number of research outputs which not only helped the construction of S&T organizations in the countries where it was conducted, but also contributed to shaping the international debate of S&T development during the 70's and 80's.

The efforts conducted were part of a large engagement of many organizations to promote science policy and policy research in developing countries. Several of these are outstanding; examples are UNESCO and UNCTAD in the UN system, and national research development cooperation agencies such as IDRC in Canada and SAREC in Sweden.

Kuramoto (2014) points out that in spite of the efforts and impacts of STPI and all the changes that have taken place in the 40 years since its conclusion, “the challenges to formulate and implement effective public policy still remain” (p. 104).

In the particular case of UNESCO, Finnemore (1993) has pointed out that its policy programme was formulated on grounds of the principle that the planning of science policy is indispensable. Therefore, 70% of its Member States created science policy organizations between 1955 and 1975, and the percentage rose to 84% in the period 1976 to 1980. The role and contributions of UNESCO has also been highlighted by the organization in a specific study (UNESCO, 2010).

Crespi and Dutrenit (2013) have collected and discussed the experience of several Latin American countries in the definition and implementation of science policy. Navarro et al. (2016) have produced a

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