Unraveling innovation platforms – Insights from co-evolution of innovation in a smallholder dairy development program in Kenya

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Keywords: innovation intermediaries, agricultural innovation system, smallholder; Kenya

Abstract

Challenges facing agricultural development, particularly in developing countries dominated by smallholder farming are increasingly framed in the context of weak innovation systems and capacities in the growing literature on agricultural innovation systems. Innovation systems (IS) approaches emphasize the collective dimension of innovation pointing to the need to effect necessary linkages and interaction among multiple actors. IS thinking also pays attention to the co-evolution of innovation processes, arguing that successful innovation results from alignment of technical, social, institutional and organizational dimensions. These insights are increasingly informing interventions that focus on supporting multi-stakeholder arrangements such as innovation platforms as mechanisms for enhancing agriculture innovation. While much emphasis in analyzing agricultural innovation systems has focused on how these multi-stakeholder platforms are organized and mechanisms through which actors interact, there has been limited analysis that has unraveled how and why such platforms contribute to innovation processes and thus they remain a black-box. This paper therefore aims to address this gap by analyzing innovation platforms as intermediaries in efforts to better understand their contribution in shaping dynamic innovation processes. The paper presents an empirical case study of the East African Dairy (EADD) program in Kenya. The program is led by a consortium of five organizations and provides a platform for building partnerships between farmers, various government and private sector actors to enhance innovation for improving productivity and market access for smallholder dairy farmers. The results show the diverse role of the platform as the innovation process unfolds and draws conclusion relevant to how the concept of platforms is usually approached and calls for a more dynamic view in analyzing them as part of understanding innovation processes.

1. Introduction

Challenges facing agricultural development in developing countries are increasingly framed in relation to weak innovation systems and capacities, particularly in a changing context of smallholder dominated agricultural systems. The changes are reflected by constraints related to persistent food insecurity, increased food prices, food safety and sustainability concerns, but also increased opportunities from emerging dynamic domestic and global agricultural markets (WorldBank, 2006). Such a dynamic context requires the sector to continually innovate if it is to contribute to sustainable socio-economic development. In this regard, the agricultural innovation systems (AIS) approach has gained currency as a framework for understanding bottlenecks and identifying opportunities for enhancing the innovation capacity of agricultural systems particularly in sub-Saharan Africa (SSA) (Sumberg, 2005 ; Hounkonnou et al., 2012).

The emphasis on the systemic nature of agriculture innovation is linked to the deepening of theoretical insights on innovation and innovation processes, also gleaned through other sectors. We now know that innovations are not just about new technical devices, but also include social and institutional change (Biggs, 1990 ; Edquist & Johnson, 1997 ; Smits, 2002). This insight point to the co-evolutionary nature of innovation. In relation to this, Agricultural innovation scholars point to the inter-linkage between technology, research, extension , infrastructure, social and organizational arrangements, input and output markets, policies, and cultural practices in enabling innovation (Leeuwis & van den Ban, 2004 ; WorldBank, 2006). Linked to this is the argument that smallholder

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farmers particularly in SSA, have only captured few opportunities by integrating new technologies, but these opportunities could be enlarged mainly through institutional change(Hounkonnou et al., 2012). The above insights are informing agricultural development efforts in SSA, which are focusing on how to support innovation in the sector. In line with the central ideas from AIS thinking on the collective nature of innovation, interventions have focused on supporting multi-stakeholder programs that coordinate and stimulate interaction among plural actors at different levels in agricultural production systems and supply chain in efforts to enable innovation and enhance livelihoods. Such multi-stakeholder arrangements have variedly been referred to as innovation platforms; coalitions, networks, and public-private partnerships (see Klerkx et al., 2009 for an overview). For the purpose of this paper we use the term innovation platform, which we define as a multi-actor configuration deliberately set up to undertake various activities around identified agricultural innovation challenges and opportunities. The focus of platforms can be research oriented, development oriented or both (Nederlof et al., 2011) Recent studies from SSA have shown that multi-stakeholder platforms contribute to enhancing agriculture innovation and even to livelihood improvement (Nederlof et al., 2011 ; van Rijn et al., 2012). However, these studies do not provide a clear understanding of why and how these platforms shape the innovation process and contribute to the outcomes. Thus, innovation platforms remain black boxes which have not been empirically looked at in efforts to critically understand their role and contribution to dynamic innovation processes. This paper aims to fill this gap through a case study of a smallholder dairy development program in Kenya. The program is being implemented by a consortium of five organizations and provides a platform for multi-stakeholders collaboration aimed at improving productivity and incomes of smallholder households. The main research question guiding the study is how innovation platforms shape and contribute to co-evolution in innovation processes in smallholder agriculture.

The paper is organized as follows. Section 2 outlines the conceptual framework. Section 3 then introduces the case study of the smallholder dairy development program in Kenya, followed by presentation of results in section 4. Analysis and discussions follow in section 5 and we conclude in section 6 where we highlight some of the practical and theoretical implications of the findings.

2. Conceptual framework

2.1 Understanding innovation as a co-evolutionary process

Co-evolution has become a useful concept for understanding innovation processes by pointing to the interaction between the technological and socio-economic elements (Radosevic, 1998 ; Moors et al., 2004). In relation to this, innovation is seen to emerge from the reconfiguration and alignment of heterogeneous set of socio-technical elements through dynamic and competitive processes of variation and selection within a system (Nelson, 1994 ; Edquist & Johnson, 1997 ; Geels, 2005). This connects to a complexity view on agricultural innovation systems(Hall & Clark, 2010 ; Klerkx et al., 2010). Leeuwis (2004) adaptation of Smits (2002) definition of innovation as a successful combination or alignment of hardware (e.g. technical devices), software (new modes of thinking, practices, and learning processes) and orgware (new social institutions and forms of organization) aptly captures this view on co-evolution of innovation and provides a useful heuristic to operationalize the concept. Nonetheless, it is important to note that co-evolution does not mean congruent and smooth evolution, but rather a dynamic form of interplay, accompanied by tensions in which, cause and effect are often difficult to distinguish (Smits, 2002). Further, the alignment or balance between the various elements is not always achieved given the sometime incongruent actions within the system (Leeuwis & Aarts, 2011). The argument therefore is that innovation is not only determined by different elements of the system, but also by how they are interconnected and mutually reinforce each other.

2.2 Supporting co-evolution of innovation – the role of innovation platforms as intermediaries

While literature on co-evolution emphasizes the alignment of different elements in innovation systems, it remains silent on how these processes unfold. Innovation is a complex and iterative process and hinged on re-ordering relations among multiple actors. However, this process is impeded by various

factors that have been described as system failures (infrastructural, institutional, network, capabilities and market structure failures) (Klein-Woolthuis et al., 2005). To overcome such system failures, recent studies have pointed to the important role of multi-actor platforms which provide a space for collaborative learning, negotiated interaction and cooperation among diverse actors to solve different problems and uncertainties (technological, social, market related, institutional in nature) related to realizing innovation visions. While, most studies on platforms tend to focus on issues of platform formation, governance and management(e.g Steins & Edwards, 1999 ; Tenywa et al., 2011), there has been little focus on understanding the functions of platforms as arenas for shaping the co-evolutionary of innovation processes and particularly their role as boundary spanning or intermediary actors (see Klerkx et al., 2010). Platforms are facilitated by intermediaries working at several interfaces and interacting with different types of actors in the innovation system, with the goal of bringing these together to work as a platform and to make the platform perform well (Klerkx et al., 2009). There has been a growing body of literature on innovation intermediaries and brokers that looks more broadly at their role not only in connecting and managing interfaces between multiple actors, but also in performing myriad of functions in dynamic innovation processes (Smits & Kuhlmann, 2004 ; Howells, 2006 ; Smedlund, 2006 ; Klerkx & Leeuwis, 2009). Kilelu et al (2011) reviewed this literature and identified six broad functions of innovation intermediaries (for details see Kilelu et al 2011):

- Demand articulation i.e. vision building, diagnosis, foresight
- Institutional support i.e. institutional change and boundary spanning
- Network brokering-, match-making of partners,
- Capacity building-, training, coaching, organizational development
- Innovation process management- aligning agendas, learning
- Knowledge brokering- connecting to knowledge and technology

Therefore, for a more robust understanding of how these platforms shape innovation, we argue for incorporation of insights from innovation intermediaries' literature to the literature on platforms.

Bringing together the ideas on co-evolution in innovation processes and innovation intermediaries, Figure 1 below presents a conceptual model for understanding the role of innovation platforms as intermediaries in supporting co-evolution of innovation. The model places the innovation platforms at the center of innovation processes and is the arena in which intermediation takes place. The innovation processes is characterized as change, illustrated loosely as a shift from one system (A) to another (B). It illustrates the platform as mediating interaction between multiple actors, and facilitates the dynamic co-evolution process by being situated in a broader social-technical context that has influence on how the change process evolves and is changed by platform actions (given that platform members are connected to this environment).

Figure 1(about here)

Case study- Shaping co-evolution of innovation: Insights from a smallholder dairy development program in Kenya

3 Case description

The smallholder dominated dairy sector in Kenya has over the years been hailed to be successful in the context of sub-Saharan Africa but still contends with challenges that have limited its potential in terms of productivity, competitiveness and improving livelihoods (Moll et al., 2007 ; Technoserve, 2008) . There are ongoing programs that aim to address these limitations, which can shed light on how and whether such interventions are enhancing innovation that is important for improving the sector. This paper presents the experience from one such program, the East Africa Dairy Development program (EADD) that is working in three countries: Kenya, Uganda and Rwanda. The study focuses on Kenya. The EADD provides a platform for building partnerships with farmers, various government and private sector actors to enhance competitiveness and improved livelihoods of smallholder dairy

farmer. The program is implemented by a consortium of five organizations that include Heifer international, International Livestock Research Institute (ILRI), Technoserve (TNS) African Breeders Services Total Cattle Management Limited (ABS TCM LTD) and World Agro-forestry Center (ICRAF). The five organizations bring in different expertise including agriculture research, business development and dairy production and take on an intermediary role on the EADD platform.

3.1 Study area

The EADD[2] in Kenya commenced in 2008 and is working in 19 sites in the Rift Valley and Central regions where dairy production is concentrated (EADD, 2011). A site is defined in relation to dairy farmers limited company formed through the program (referred to as DFBA in the program). Because of the breath of the program areas of focus, the research was conducted in two sites that were purposively selected with guidance from EADD staff – Tanykina Dairy Company Ltd (Kipkaren) and Mektei Multipurpose Dairy companies. The sites are in separate districts in the Rift Valley region and have different histories which provided more insights on the operation of the program.

3.2 Methodology

The research used a case study design. The case study design was selected as it is more appropriate for providing insight into the dynamism of innovation and innovation processes. As a case study the decision was made to focus on two sites in order to capture in-depth the innovation process which required extended data collection. The aim was not to develop generalized, prescriptive accounts but rather to look for patterns that can offer some explanatory analysis to contribute to the understanding of the role of platforms as intermediaries in co-evolutionary processes (following Yin, 2002).
Various data collection methods were used to understand the processes but also to ensure reliability and validity (Yin, 2002). The data was collected over time from August 2010 to December 2011. Semi-structured interviews and group discussions with key informants were used to understand the history of the program and the nature of interventions which were categorized using the orgware, software and hardware schema. The informants include EADD program staff, managers and staff at the two DFBAs. Group meetings were held with District livestock officers and various service providers i.e. AI technicians, Animal health assistants and extension workers in both sites. To understand farmers views and experiences with the program, 9 mixed-gender and women only focus group discussions (FGD) were conducted with farmer groups involved in the program from different villages in each site. In addition one FGD was conducted in each site with farmers not in groups some of whom were not involved in the program. Approximately 15 farmers attended each meeting. Interviews and discussion data were taped and fully transcribed for analysis. We supplemented this data with direct observations and participation at various meetings during site visits, in addition to annual mid-term evaluation project reports. From this data we characterized the different elements of co-evolution over time of the main intervening (innovations) areas and used this characterization to unravel the role of the platform in the process.

4 RESULTS

4.1 Co-evolution of innovation in EADD – The Entry point

The EADD program interventions were guided by diagnostic and feasibility studies conducted at the start of the program. These formed the basis for innovation interventions that mainly focused on three main areas i) improving breeding and animal health ii) improving feed management and enhancing access to quality and affordable feeds iii) strengthening market access for smallholders (EADD, 2009a ; 2009d ; 2009b). While these studies pointed to areas of intervention, the processes of addressing them evolved overtime. As an entry point, EADD promoted the vision of initiating farmer owned dairy limited companies, an institutional innovation that was a shift from the dominant but ineffective dairy cooperative societies.

[2] The East Africa Dairy Development (EADD) program is supported by the Bill and Melinda Gates Foundation.

Key informants described the process setting up the companies that entailed first putting in place an interim leadership board of directors nominated by the community, followed by mobilizing farmers to register and purchase shares in the company. Mobilizing farmers was a challenge in early stages of the project because of what was noted as a checkered history of co-operatives and collective action in dairy farming(EADD, 2009c). For Tanykina DFBA, mobilizing farmers moved a bit faster because there was a pre-existing cooperative with a cooling tank that had been set up with support from Heifer international, although it was not running profitably. Metkei DFBA on the other hand is a conglomerate of four cooperative societies that were still operational but struggling: Tulwobei; Mektei, Kapkitony and Kipsaos. While the cooperatives agreed to form the company they still retained their identity including members, making it challenging to mobilize farmers. For this reason, it took longer to raise the equity and delayed the acquisition of the chilling plant which began full operations in February 2010 (EADD, 2011a).

4.1.2 The role of the platform as an intermediary at the early stage

At the early stage of the program, the consortium was instrumental in promoting the vision of the program for an alternative dairy business model during mobilization. A key strategy used to mobilize farmers was to involve local administration, relevant government ministries at different administrative levels (e.g. division and district) and local politicians. Building this initial network was strategic for getting long term support for the program. EADD also facilitated and provided technical backstopping in drawing up business plans and governance structures for the DFBAs.

4.2 Co-evolution of innovation to improve milk production and marketing

Below we present findings on role of the platform in intermediating in the dynamic processes related to various innovations.

4.2.1 Enhancing innovation through improved dairy marketing

The program aimed to not only increase milk production but also enhance market access for farmers with a particular emphasis on their participation in the cold milk value chain. Overtime, the milk volumes delivered to Tanykina and Metkei Multipurpose Ltd increased. In 2009, Tanykina Ltd received on average of 15000 l/day, this went up to over 20000 l/day in 2010 and 2011. Metkei Ltd received about 5,000 l/day at inception, and was receiving about 22,000 l/day. The prices of milk also went up both for the dairy companies and what was paid to the farmers. There was also moderate increase in milk production per farmer deducing from the average milk delivered daily per farmer. In Tanykina, farmers increased their delivery to the chilling plant from 6 to 10 liters per day, while in Metkei, production increased from 4 to 6 liters respectively. Factoring in that farmers indicated that they consumed an average of 3 liters per day, the average production was about 13 and 9 liters respectively. Below is a summary of sequence of activities related to supporting marketing

Table 1: Summary of innovations related to marketing

Intervention	Dimension of innovation	Intermediary function
1. Set up of farmer owned Dairy companies (DFBA).	Institutional, organizational	Vision development for new business mode Recruitment of management staff-TNS Business support for Board- TNS
2. Installing cooling plants and equipped laboratories and integrated with ICT-dairy management software, electric weighing scales	Technical Institutional	Technical support in procurement and set-up Mobilize funding through partnerships(TNS and Heifer)

3. Integration of a business hub offering services (A.I, Animal Health, banking, Agrovet, transport, extension) incorporating check-off – payment/credit system to enhance access to inputs and services	Institutional,	Provide guidance set-up and operationalization of hub (TNS)
4. Signing contracts with processing companies	Institutional,	Support DFBA in negotiation-TNS

Famers at both sites noted that the installation of the cooling tanks gave them confidence about accessing markets. While the bulking and cooling of milk was expected to streamline marketing, it did not mean impeding competition among the many different buyers. This is better understood in the context of the milk marketing policy in Kenya that was liberalized in 1992, opening up the market to many processors and increasing competition for milk (Muriuki et al., 2003). Thus the milk market remains precarious and farmers noted a precarious market with continued seasonal fluctuations in prices and sometimes reduction in volumes bought by the processors during 'glut' periods. Farmers marketing practice also reflected the diverse market. Most farmers divide their milk and sell through different marketing channels, including informal milk traders. In Tanykina, we noted that most farmers sold through different channels more than in Metkei as there were processors companies competing for Milk in Tanykina. While farmers noted that their main consideration for selling to different buyers was price, transportation costs particularly for farmers in remote areas also pushed them to sell at farm gate. Both Tanykina and Metkei set up a few satellite collection centers (cooling tanks) to address this challenge. Some farmers noted that productivity was still low, thus impeding them from accessing services or inputs through the check –off system. Discussions with the EADD team noted tensions in the consortium where some partners felt that there too much focus on strengthening the DFBA at the expense of supporting farmer productivity.

4.2.2 Dynamics of improving breeding practices

AI was one of the key interventions for improving milk productivity. While AI was not a new technology in Metkei and Tanykina as farmers noted, its uptake had declined over the years. This was due to many factors including limited number of service providers, cultural values and practices and the cost of semen which drastically increased following various government policy shifts over the years and after government stopped subsidizing AI (Muriuki et al., 2003). As figure 2 shows there was notable increase in AI use in both sites. The drop in inseminations in Tanykina is notable, which we discuss further below

Fig 2 (about here).

Table 2: Summary of breeding related innovations

Intervention	Dimension of innovation	Intermediary function
1. Enhancing access to quality semen at DFBA available through the check-off system. Subsidizing some imported semen	Technological, Institutional	Procurement and distribution of semen (ABS-TCM)
2. Facilitate training of A.I providers and providing them with necessary equipment (loans for bikes)	Technological, Institutional	Forging partnerships for training (with a government training institute) and kitting such as motorbikes and tanks (with various commercial banks). Fostering entrepreneurship of the service providers (i.e. business development services (ABS-TCM and

		TNS)
3. Training farmers on AI and breeding using various approaches (TOT, Farmer trainer, Dairy Management groups (DMG), Community extension service providers). Expected to enhance	Institutional	Co-designing of extension modules (ABS-TCM and Heifer)
4. Testing village bull concept- Encouraging farmer groups to get their own semen tank and stock	Technological Institutional	To facilitate procurement of tanks (ABS-TCM)

Interesting dynamics unfolded in the process of improving breeding. Many farmers, particularly in the DMGs indicated an overall there was an increase in use of A.I, noting that training on breeding and the check-off system had contributed to this change. Conversely, many farmers who had not joined groups indicated that limited knowledge on breeding was one reason they did not use A.I, since training was conducted through groups. The training and extension approaches, including use of farmer groups were shaped by the policy context in Kenya that promotes pluralism in extension services provision (RepublicofKenya, 2005).

However, even with the check-off system and reduction in the cost of some semen many farmers still considered AI to be expensive. Some farmers noted reverting to bulls as a cheaper option, although the use of bulls also persisted also because of other traditional practice including uncontrolled open grazing. A recurrent problem that farmers linked to the high costs of insemination was repeats because of AI misses. Also, while access to service providers had been enhanced, some farmers also linked repeats to delayed responses by service providers, particularly because there was still a shortage and the few had to cover long distances in very poor terrain. In Tanykina, program staff noted that some of providers had moved to a neighboring DFBA. Service providers on the other hand noted that part of the challenge that farmers were not detecting heat on time. In some cases, it was noted that in some households women had to wait for their husbands to make decisions on AI which resulted in delays in insemination. Also while some of the imported semen provided through the program was subsidized, it was not preferred by some of the farmers. The farmers expressed some reservations pointing to issues of quality and also suitability of the semen noting that this constrained their choice. Although farmers perceived missed conceptions as major problem, from discussions with various informants it was not clear how this feedback was informing re-alignment of activities related to address this challenge. However, EADD was collaborating with some researchers in the development and testing of simple, affordable heat detection and pregnancy kits. However, this study was in early stages of development at the time of our research. In addition, while improving breeding practice is dependent on farmers keeping proper records for all insemination and also on ear tagging, however most farmers indicated that they did not consistently keep records.

4.2.3 Enhancing production through improved feeds and feeding practices

The program supported various interventions aimed at improving access to feed resources and better feed management that combined promotion of fodder production and promotion of feed conservation methods so to maximize milk production while minimizing cost of feeds. Below we illustrate the various interventions that combined technical and institutional dimensions to address feeds constraints.

Table 3: Summary of innovations activities for improved feeding

Area of intervention	Dimension of innovation	Intermediary function
1. Training and dissemination of information on various feeds and feed conservation through extension- This was done over time	Institutional, organizational	Support of extension in partnership with Ministry of Livestock (Heifer- ICRAF)
2. Setting up and support of demonstration farmers (also for seed multiplication) and dissemination of seeds	Institutional, technology	Technical back stopping of demonstration farmers including set-up, supplying seed, and follow up (ICRAF)
3. Participatory research to test some new forage crops (e.g. dual purpose sweet potatoes)	Institutional practice	Identifying sites and set up of experiments in collaboration with other scientist and farmers (ICRAF)
4. Promoting the use of small scale feed processing technologies – pulverizes and chuff cutters	Technological	Facilitate procurement for through partnership with local SMEs (Heifer and TNS)

While farmers were aware of the importance of improved feed strategies, it was not reflected in their feeding practices and strategies. In both Metkei and Tanykina natural pastures provided the largest portion of livestock feed , supplemented by use of planted fodder (e.g. Napier grass) was the predominant method of feeding, supplemented by purchasing concentrate feeds particularly during the dry season. The reliance on pastures resulted in a perennial problem of limited feeds during the dry season which was reflected in low volumes of milk.

Analysis and discussions

5.1 Innovation platforms support co-evolution by synchronizing mutually reinforcing developments

The findings show that innovation platforms play an important intermediary role in stimulating and influencing innovation processes. The results unpack how the platform shapes co-evolutionary processes, fostering institutional and organizational innovation, which have been indicated as the main limitations facing smallholders in SSA (Hounkonnou et al., 2012). While the results indicate that technological innovation in EAAD was incremental in nature and entailed mainly the application or integration of available technologies (e.g. cooling tanks, AI, fodder), nonetheless this contribute to some level of system change (from smallholder subsistence dairy to more commercial dairy farming). From a co-evolutionary perspective on innovation, the strength of EAAD as an innovation platform was in aligning the technical and institutional elements, and at some level in mediating change of relations among various actors. It ensured that different issues of technological, institutional and organizational nature developed in tandem. For example, the introduction of ICT in records management enhanced farmers' trust of the dairy company as it introduced more transparency in weighing of milk. Also, the establishment of dairy companies, and the guarantees provided by EADD enabled companies to secure credit from commercial banks, which previously were wary of lending to farmers. This confirms that platforms contribution to institutional change has an effect on quality of actor interactions (van Lente et al., 2003 ; Dormon et al., 2007 ; Nygaard, 2008).

However, the caveat is that while the platforms intermediated in building and organizing the processes, we know that innovation processes cannot be managed or the direction controlled (Hekkert & Negro, 2009 ; Hall & Clark, 2010 ; Klerkx et al., 2010 ; Leeuwis & Aarts, 2011). Various tensions that emerged point to the unpredictability of innovation processes, which cannot be managed as expected in platforms. While these tensions can potentially open windows of opportunity for new innovation, it was not clear how the platform entrenched learning and feedback processes to re-align with emerging issues. Innovation processes are dynamic and thus require an adaptive approach to steering such processes. As such, the intermediary actors need to be more aware of these continuous changes and have flexibility need to re-adjust focus. This might be challenge for platforms that are externally orchestrated and funded , point to some tensions of intermediation (eg funding, legitimacy)(Klerkx & Leeuwis, 2008).

5.2 Dynamic and distributed nature of intermediation in platforms

The results confirm that intermediation includes fulfilling a myriad of functions but these are also distributed over time and also among actors. Conceptualizing the platform as an intermediation arena opens the back box of platforms. The results indicate that platforms can be effective, because they bundle complimentary skills and competencies that the consortium members brought to the program that was linked to their core business as organizations and allow for working on institutional change at different levels in the dairy system. More than a central facilitator or innovation broker, there is a set of intermediaries, similar to what Klerkx et al. (2010) observed and what Stewart and Hysallo (2008) have referred to as “ecologies of intermediaries’’. At the beginning of the innovation process, we note the important role of the consortium actors in facilitating the articulation of the innovation vision and mobilizing funding and other resources necessary for the program. This is then followed by orchestrating networks of different actors who were brought in at different points in time, mainly around specific issues. This included selecting which actors were important for fulfilling a particular objective at a particular point. This contributed to adjustments and reconfigurations, including patterns of cooperation among the actors. This indicates that platforms are also highly dynamic and distributed in composition, opposed to static structures, conforming findings of Nederlof et al (2011). While this distributed nature of intermediation functions is useful, we also note that it can be limiting in the sense that the different intermediary actors tend to focus on what seem to be their areas of interest and in some cases this can undermine the broader vision of the program.

Conclusion

This article has demonstrated those innovation platforms are important mechanisms for stimulating and coordinating interactions in innovation systems. Platform as intermediaries provide the spaces to experiment with different ways of aligning technological and institutional dimensions that are necessary for successful innovation. The dynamic nature of innovation processes point towards seeing platforms as dynamic evolving networks instead of static structures. Having a better insight how platforms co-evolve with innovation processes, and vice versa, may give insights on how to optimize platforms in terms of composition and governance. This would be the subject for future work.

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