A state-initiated multi-stakeholder platform as an instrument to build agricultural innovation system capacity: a case study from Ethiopia

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ABSTRACT

The agricultural innovation systems (AIS) in many Sub-Sahara African (SSA) countries lack the structural capacities to support smallholder-inclusive innovation. Multi-stakeholder Innovation Platforms (IPs) have been proposed as systemic instruments to improve the functioning and building of the structural capacities of the Innovation System (IS). This article studies the role of state-initiated IPs and multilevel Agriculture Development Partners Linkage Advisory Councils (ADPLACs) in tackling the systemic problems of the AIS in Tigray, Ethiopia. After studying policy documents, in-depth interviews were conducted with various participants of ADPLACs. The results show that the contribution of ADPLAC in building the structural capacities is limited; due to the absence of some important enabling factors and the presence of several intertwined constraints. The major finding of this study is that the interlocked nature of the systemic problems constrained the functioning of the platform, indicating the need for combining IPs with other systemic instruments, to overcome the lock-in.

1. Introduction

In many SSA countries, the linear Transfer-of-Technology (ToT) innovation paradigm still predominates (Smink, Hekkert, and Negro 2015; Schut, Klerkx, et al. 2016, 2019). The ToT model is often criticized for its top-down, supply driven and technological approach, in which the smallholder context is not considered (Klerkx et al. 2012). Conversely, the IS perspective underscores the importance of interactions and learning to improve individual and collective capacity to innovate, and develop the institutional and infrastructural preconditions for inclusive, sustainable development (Lundvall et al. 2002; Hounkonnou et al. 2012).

There is a need to promote IS approach, in which stakeholders and experts exchange knowledge and concerns, learn and reflect upon possible pathways for development. This creates a space where the stakeholders jointly select and implement those suited for the

circumstances and able to address societal challenges such as inequality, poverty and climate change (Altenburg 2009; Hekkert et al. 2020). Interactive, or inclusive, innovation approaches are more likely to provide solutions that are technically sound, match the aspirations and resources of farmers, and align with the institutional context (Schut et al. 2019).

IS in developing countries, including the sub-Saharan countries, is often considered to be 'immature' or 'catching up' (Albuquerque 1999; Chaminade et al. 2009; Rapini et al. 2009). Actors, such as universities and research, financial, educational and intermediate organizations exist but have relatively low competences and lack the linkages and institutional bridging capacity to engage in demand-driven innovation approaches (Arocena and Sutz 2000; Altenburg 2009; Rapini et al. 2009; Nelson 2004; Chaminade and Padilla-Pérez 2017). Policy makers therefor have an interest in systemic instruments, which focus on change of the process and direction of a whole innovation system, rather than a part (Smits and Kuhlmann 2004). They tend to promote innovation platforms (IPs) or Public-Private-Partnerships (PPPs) as systemic instruments, enhancing multi-stakeholder dialogue, learning and experimentation, to establish the critical innovation functions and build the structural capacities at the innovation system level (Smits and Kuhlmann 2004; Turner et al. 2016). Assumption is that through their functioning, IPs and PPPs build capacities for the orchestration of customized policy mixes (Triomphe and Rajalahti 2013).

Different authors have confirmed the potential of IPs to provide space for stakeholders from different backgrounds to identify, prioritize, and address issues of mutual concern (Mur and Nederlof 2012; Schut et al. 2011). Yet, they are also reported to have made a limited contribution to structural change (Van Paassen et al. 2014).

In this study, we therefore explore the impact of state-facilitated IP, ADPLAC in Ethiopia, on enhancing more interactive form of agricultural innovation for farmer development and bringing structural change in the dominant top-down AIS, by enforcing change from within. We assume that state-driven IPs are well-embedded, and therewith have a good potential to induce regime actors to create the required conducive innovation policies, incentives and regulations.

2. Theoretical framework

Various theoretical concepts have been used to study innovation systems, their core functions and shortcomings (Minh, Larsen, and Neef 2010; Minh et al. 2014; Van Paassen et al. 2014; Wigboldus et al. 2016; Wieczorek and Hekkert 2012). The focus of this paper is on exploring the impact of state-facilitated platform in transforming the national AIS, by enforcing change from within. So, we operationalize the theoretical framework of Wieczorek and Hekkert (2012) for the agricultural sector in a developing country context. Wieczorek and Hekkert (2012) argued that the performance of an IS depends on its structural elements. They distinguished four types of structural elements and eight related systemic problems which affect IS capacities (see Table 1). The structural elements are the actors, their interactions, the institutions and the infrastructure. The actors include different types of individuals and organizations in the IS (e.g. Government, NGOs, civil society). Interactions are the dynamic relationships among actors, which range from individual contacts to dense networks (Turner et al. 2016; Wieczorek and

Table 1. Systemic capacity and possible goals of systemic instruments

Structural elements that determine IS capacity	Type of systemic Problem	Aims of systemic instrument
Actors	Presence	Stimulate and organize the participation of various actors
	Capabilities	Create space to develop the capabilities of actors
Interactions	Presence	Stimulate the occurrence of interactions
	Intensity/quality	Prevent overly strong and overly weak linkages
Institutions	Presence?	Secure presence of (formal and informal) institutions
	Capacity/Quality	Prevent overly weak or overly strict institutions
Infrastructure	Presence	Stimulate physical, financial and knowledge infrastructure
	Capacity/Quality	Ensure the adequate quality of the infrastructure

From Wieczorek and Hekkert (2012).

Hekkert 2012). Institutions are the sets of rules that exist to reduce uncertainty in human interaction (North 1990). We distinguish formal and informal institutions where formal institutions are polices, rules and regulations, etc.; and informal institutions cover culture, routines and established practices in an AIS. Infrastructure includes physical (e.g. technologies); knowledge (e.g. research, development and advisory services), and financial infrastructures (e.g. grant programmes) (Turner et al. 2016; Wieczorek and Hekkert 2012). For details on the systemic problems see Wieczorek and Hekkert (2012).

In a developing country with a dominant ToT, the capacity of an IP to strengthen the IS depends on various enabling and constraining factors (Schut, van Asten, et al. 2016). The **first** enabling factor is the representation of the 'right' stakeholders in the IP. It is essential to get actors on board who have a real stake, are knowledgeable, or have authority to enforce the required technical, organizational or institutional changes (Van Paassen et al. 2014). The **second** enabling factor is facilitation by neutral and capable brokers, with skills and knowledge to bring the relevant actors together, foster learning, coordinated action, monitoring and evaluation (Nederlof et al. 2011; Swaans et al. 2014). The **third** enabling factors are institutional arrangements that encourage platform facilitators and members to put their newly acquired competences into practice (Schut, Klerkx, et al. 2016). Among the constrains, identified by the literature, are limited understanding by IP members and facilitators of the IS principles, the facilitation of interactive multi-stakeholder processes, or how to address structural power inequalities (Cullen et al. 2014; Adejuwon 2016; Schut, Klerkx, et al. 2016). When R&D organizations adhere to the linear Transfer-of-Technology approach, there are limited resources for collaborative approaches (Kristjanson et al. 2009). Actors' motivations might be hampered by ambiguous objectives, absence of monitoring & evaluation, or inappropriate incentive mechanisms and mandates (Nederlof et al. 2011; Schut, van Asten, et al. 2016, 2019). Cullen et al. (2014) and Schut et al. (2019) also note that regime actors may feel threatened by the collaborative IP approach and be reluctant to create a conducive institutional environment.

Keeping these elements in mind, we posed the following research questions:

- To what extent can an embedded IP such as ADPLAC, contribute to AIS capacity building?
- What are the enabling and constraining factors for such an IP in a predominant ToT context?

3. Case selection and research design

3.1. Case selection

The Ethiopian People's Revolutionary Democracy Front (EPRDF) government that took power in 1991 demonstrated a high commitment to agricultural development, food security, and a political support base among farmers (Berhanu and Poulon 2014). As a result, most of the key actors for agricultural innovation, such as research, education and extension facilities, farmer cooperatives and unions, traders, input- and service suppliers are present. The Ethiopian Science, Technology and Innovation (STI) policy is predominantly ToT centred (FDRE 2012). However, the agricultural policy of the country 'Agricultural Development-Led Industrialization' (ADLI), implicitly recognizes the need for a more dynamic, inclusive IS (Spielman et al. 2011; Woodhill et al. 2011; Berhanu and Poulon 2014). In 2008, the government established the Agricultural Development Partners Linkage Advisory Councils (ADPLACs) to enhance collaborative agricultural innovation (Ludi et al. 2013; Kebebe et al. 2015). This article explores the contributions of the councils in Tigray regional state in tackling the systemic AIS problems; and the structural conditions influencing its enactment.

3.2. Research design

We opted for a case study method, as it is suitable for research with a descriptive question and/or an explanatory question (Yin 2004). First, secondary sources such as guidelines, minutes of ADPLAC meetings, diagnostic studies and reports from governmental sources and NGOs were studied. Especially, a guideline developed by the Ministry of Agriculture and Natural Resources (MoANR 2010) was used to explore the history, the design (organizational structure and membership) and intended contributions of the ADPLACs. Secondly, in-depth interviews were performed to generate descriptions and interpretations from people's point of view (Lewis 2003; Ritchie 2003). In ADPLAC, most of the participants represented a particular organization. So, the interviewees came from different levels of the Tigray Bureau of Agriculture and Rural Development (TBOARD), Tigray Agricultural Research Institute (TARI) and research centres, from NGO projects and farmers.

Purposive and snowball sampling was applied to select representatives participating at different levels of ADPLAC. Ministry of Agriculture (MOA), specifically the extension department is responsible for leading and organizing ADPLAC at the national/federal level. Hence, the national Extension director was selected purposively to get an overview of the challenges and opportunities and policy-related issues at the national level, even though the study focuses in Tigray. At the regional level, TBOARD and TARI are responsible for leading and organizing ADPLAC. So, the bureau head and the institute director were selected purposively. Agricultural Growth Programme (AGP) is the financer of the ADPLAC meetings, and thus coordinators of the programme at different administrative levels (who also patriciate in organizing the meetings), were selected purposively. The other interviewees were suggested by TBOARD head, TBOARD Extension head, Zone and Woreda Level Agriculture office heads. and TARI Director. The suggestion was made based on their role in organizing the ADPLAC meetings at regional, zonal and

woreda levels, and based on the experience of participation in the meetings. Farmers were selected by Development Agents (DAs) in the respective Kebeles, based on their experience of participation in the ADPLAC meetings.

While individual interviews were used in most cases, group interviews were also executed when seemed most useful. Interviewees who have something in common and can form a unit together were interviewed together. Examples: representatives who work for the same bureau/institute (with the same or different roles) and have similar roles in organizing the ADPLAC meetings or are part of an innovation platform of another project, and representatives of different projects who are part of an innovation platform of another project. In total 27 people were interviewed, 18 individually and 9 in groups. For details on the profile of interviewees and interview types executed see Appendix 1.

In the interviews, we always started by asking the interviewees general questions such as: main mandate of the organization they represent, the services it provides to the public and their opinion on the role of the multi-stakeholder approach. Then to explore the understanding and the intended goals, we asked respondents (especially facilitators) about the historical evolution, the purpose and the problems intended to be tackled by ADPLAC. Building on the secondary information, especially the ADPLACs guideline, and our analytical framework, we also asked the interviewees about the actual organizational structure, membership, and roles of actors. To explore the actual implementation of ADPLAC, questions related to decision making procedures and the process of agenda setting, planning, execution, monitoring and evaluation, and feedback in ADPLAC were asked. To inquire into the actual contributions of ADPLAC, interviewees were asked about the roles the ADPLAC is playing in (1)creating linkage between the research, extension, farmers and beyond; and improving research and extension services (making them demand-based that can tackle grassroot level problems); (2) building the capacity of actors; (3) inducing institutional change (changing old and/or introducing new culture and practices, and policies to tackle regulations related issues); and (4) resource mobilization such as funding for innovation to tackle resource/materials problems. Interviewees who have experience of participation in other platforms such as local groups or networks were asked to compare their experience in ADPLAC with their past or present experiences. The issues for comparison were: purpose/objective, the approach and engagement of farmers, membership, procedure/process and contributions (in achieving its purpose of establishment and, specifically in tackling systemic problems such as actors' capacity, interaction, institution and infrastructural problems). The questions asked to the farmers focused on: activities performed by ADPLAC; the roles played by the farmers in the meetings; the contribution of ADPLAC for setting agendas from famers' perspective and for solving farmers problems; and the limitations of the councils in solving the problems of farmers. We also sought to assess the limitations of ADPLAC in implementation and the perceived enabling and constraining factors for ADPLACs to achieve their aims.

3.3. Analysis method

Most interviews were recorded and fully transcribed. Interviews and information from secondary data were coded, in line with the theoretical framework that frames the relationships among the structural elements that determine IS capacity, the related

type of systemic problem, and the aims of systemic instrument in tackling the problems (refer to Table 1); and the potential enabling and constraining factors for IP functioning. The iterative coding and structuring enabled the identification of intended and actual contributions of ADPLAC councils in tackling systemic problems, and the obstacles to function as instrument for systemic change. Finally, causal tree diagrams were drawn to get overview of the core factors, restraining the councils to functioning (see Figure 4).

4. Findings

In this section, we first present the history, the design and the intended contributions of the ADPLACs. Then we look at the actual practice and explore the contribution of ADPALCs in tackling the systemic problems of the AIS.

4.1. ADPLAC's intended contribution to systemic capacity building

The efforts to create more linkages and interaction among innovation actors, (mainly research and extension) go back to 1986, when the government launched the Peasant Agriculture Development Programme (PADEP). They formed Research Extension Liaison Committees (RELCs) at national and zonal levels. These committees did not function well and were dissolved with the change of government in 1991. However, the concerns about poor linkages resurfaced and in 1999 the new EPRDF government initiated the Research Extension Farmers Advisory Council (REFAC) at national, regional and zonal levels. These councils struggled with a variety of systemic problems and did not function as hoped for. The weaknesses of both councils, as reported by MoANR (2015), are summarized in Table 2.

Conscious of these failings, the Federal/National Ministry (MoANR) launched a new multi-stakeholder platform in 2008, named Agriculture and Development Partners Linkage Advisory Council (ADPLAC). The council was established 'to create a situation where all stakeholders make their contributions to the success of agricultural development in an integrated and harmonized way' (MoANR 2010, 66). The specific objectives mentioned were: to create a conducive environment for collaboration among agricultural development actors and build their capacity to ensure demand-led technology generation; integration and alignment of activities; efficient resource utilization; and participatory monitoring and evaluation (MoANR 2010, 67).

As shown in Figure 1, the ADPLAC councils were supposed to have a hierarchical structure, from national, regional, zonal, Woreda down to Kebele level. The State Agriculture Deputy Minister, regional bureau of agriculture heads, zonal administrator/agriculture office heads, Woreda office of agriculture & rural development heads, and Kebele administrators presumed to chair the meetings. While research institutions were supposed to co-chairs; extension offices were expected to act as the secretary. Higher-level councils were expected to provide capacity-building activities for the lower-level councils and evaluate their performances. Agendas and feedback reports were supposed to come from the local level.

Council membership and representation varied between levels. The aim was to achieve the participation of all relevant actors at each administrative level, including government organizations, NGOs, private companies, civil organizations and farmers'

Table 2. Reported weaknesses of RELC and REAC

Issues identified as weaknesses	Linkage efforts	
	RELC (1986-1991)	REAC (2000-2008)
Actors' capacity Interaction	• Lack of steering capacity of the facilitators • Insufficient representation and participation of farmers • Ad-hoc and non-institutionalized nature of meetings	• Domination of government organizations and their officials with limited representation of farmers • Ad-hoc and non-institutionalized nature of meetings
Institutions	• Ambiguity or absence of clear working guidelines • Absence of monitoring and evaluation mechanisms • Lack of incentive mechanisms • Lack of positive perceptions among stakeholders; and lack of real accountability	• Ambiguity or absence of clear working guidelines • Lack of sustained follow-up (monitoring) of linkage related activities
Infrastructure	• Serious lack of funding and human resources	• Serious shortage of funding

Source: MoANR (2015).
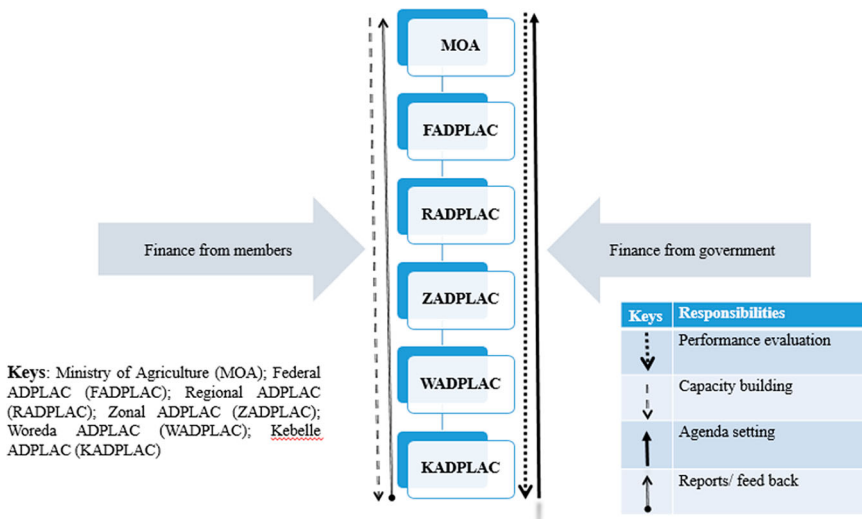
Figure 1. Organizational structure of ADPLACs in design.

representatives. The federal/national, regional and zonal level councils were supposed to meet twice a year; and the Woreda and Kebele levels every 3 months. Government would allocate funding for council meetings at all levels. If this was insufficient, the council was supposed to search for extra funds from projects and other sources.

4.2. The actual contribution of ADPLAC to systemic capacity building

4.2.1. Actors' capacities

As shown in Figure 2, the councils were established at the four higher levels, but not at Kebele level, due to limited funding. The core members were from Governmental Organizations (hereafter called GOs) which include: TBOARD, TARI, research centres, administration bodies, higher learning institutions, and Agricultural Training and Vocational Education and Training (ATVET) colleges. Nonetheless, representatives of NGOs such
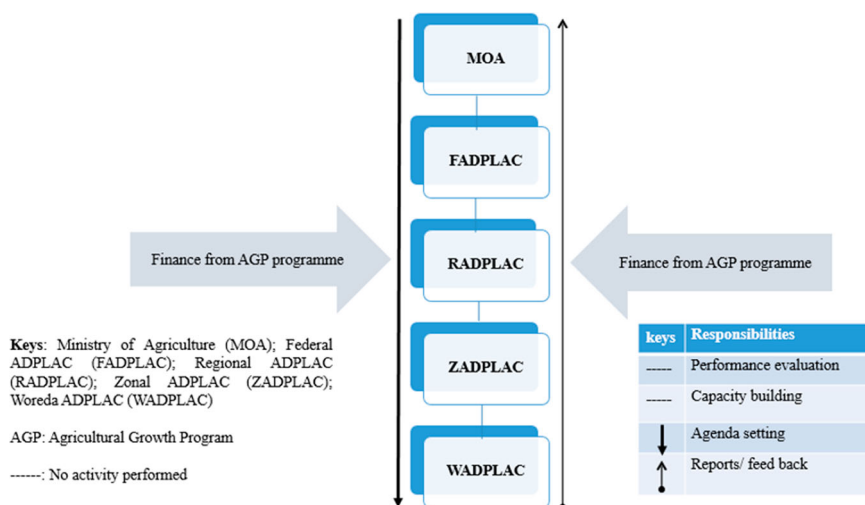
Figure 2. Organizational structure of ADPLACs in practice.

as donor-based projects, Civil Organizations (COs) such as multipurpose cooperatives and unions, women/youth/farmers' associations, Private Sectors (PS), and Farmers (F) were also invited (see Figure 3).

Bureaus/offices of agriculture and rural development took responsibility for the coordination and facilitation, while research institutes co-chaired meetings. People appointed as focal persons of the AGP in the bureau/offices of agriculture at various administrative levels were assigned to support the organization of the meetings and monitor progress.

Many respondents of various organizations agreed that the councils did stimulate the participation of actors, directly or indirectly involved in agricultural development (see Figure 3). GO interviewees mentioned that capacity building mainly happened through the joint identification of main bottlenecks in agricultural production and marketing. The articulation and prioritization of problems enabled them to develop common
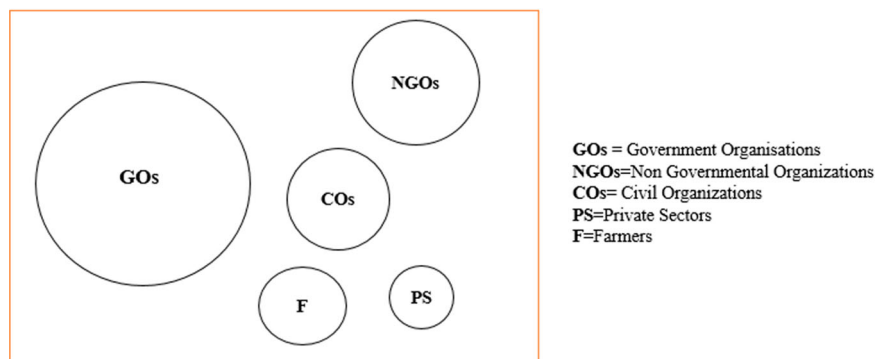

Figure 3. Schematic representation of members of councils: (Circle size indicates the representation and participation of actors).

visions on what to achieve, and how to align their activities with the government's growth and transformation plan. A few respondents noted an improved efficiency in the use of resources (e.g. fertilizer, improved seeds and other technologies). A national-level officer remarked:

> ADPLAC creates collaborative efforts. It brings together the resources and time of different stakeholders. This avoids duplication of efforts and leads to more efficient utilization of available resources.

Other respondents had the feeling that the councils themselves did not build capacities, but rather identified gaps in knowledge and competences of the different actors and advised them how to acquire the necessary expertise. One interviewee noted:

> ADPLAC might not have made a direct contribution in building the capacity of actors, but it identified capacity gaps at the grass roots level and then linked with actors responsible for capacity building activities; such as ATVETS, universities, and others.

Respondents reported various limitations and obstacles for the councils to achieve their goals. The main limitation was the dominance of government in the composition and focus of the council, and a relative absence of private actors and NGOs. Furthermore, some key government actors, expertise, and resources lacked at some levels. A government officer remarked:

> In our hierarchic organizational culture, it is essential to work and collaborate according to your mandate and position. It is therefore sometimes difficult to engage a government organization from another level.

This means that at times a critical capacity was missing to solve an identified innovation problem at a certain level. Lack of clear development perspectives and capacities in ADPLAC were other obstacles reported.

Limited farmer representation and participation was the other reported limitation of the ADPLAC. This was a persistent problem that predecessors such as RELC and REAC also struggled with (see Table 2). Many government officers claimed that the farmer representation had improved, especially at Woreda levels, but did not capture diversity at the local level. Ordinary farmers were not invited. Farmers who participated had positions as Kebele administrators or union or cooperative leaders, or at least 'model farmers', farmers who are assumed to mobilize and guide other farmers. One of the AGP coordinator, in one of the Woredas explained:

> The types of farmers who participated in the meetings were model farmers … … those who use new technologies and increase their productivity. We aim to create farmers similar to them.

Consequently, ADPLAC did not tap into the diversity of farmer capacities at the local level.

The last limitation mentioned was the absence of ADPLAC capacity-building activities. Although, lower-level councils were supposed to be trained by the upper-level councils (see section 4.1 and Figure 1), all interviewees confirmed that there was no training of any kind (see Figure 2). An appointed meeting organizer-cum-facilitator noted:

> We haven't received any type of training about ADPLAC, regarding how it should function and managed or facilitated. We just read the guide line by ourselves.

Training was said to lack because policy documents did not include concrete plans on how to organize the capacity building. Furthermore, some respondents noted that most council members did not know the innovation principles behind ADPLAC, which limited their attention and learning.

4.2.2. Interactions

In the opinion of the respondents, the councils did stimulate interaction between GOs, NGOs, Coops, private companies and farmers. The regional and Woreda level councils met twice a year. In the first meeting, actors identified and prioritized the major bottlenecks for agricultural production and marketing, discussed solutions, and allocated responsibilities for people to act. Actors accepted responsibilities that were in line with their mandates. In the second meeting, actors reported whether and how they executed the assigned tasks, so that council members could evaluate, comment or raise questions.

In the mind of most respondents, the function of ADPLAC was sharing information on how to align each one's activities with the agricultural growth and transformation plan. Apart from this, the interviewees from the agricultural researcher centres/institute appreciated the opportunity to present their research proposals in the planning meeting, and subsequently share results at the evaluation meeting. Some respondents from the Office of Agriculture and Rural Development noted some instances in which the council enabled them to identify a useful market link. In one example a connection was created between malt barley farmers and the Raya Beer Factory. In sum, the councils stimulated some knowledge sharing and coordinated development actions.

Despite the highlighted contributions, respondents also mentioned many limitations and obstacles of ADPLAC functioning. Interactions were not perceived to be very intense. Most councils met biannually, while the Woreda level was supposed to meet every three months. Zonal meetings were sometimes cancelled.

Furthermore, councils could have been used as a forum to discuss collaboration and required conducive policies, but as an AGP focal person noted:

> Policy issues related to interactive innovation processes were hardly discussed.

Many respondents agreed that interactions were limited to planning and outcome reporting of input services such as improved seeds/varieties, fertilizers and pesticides, but lacked initiatives for coordinated action and monitoring, as the following quote illustrates.

> Although actors agreed to take their assignments and promised to play their role in solving a particular problem during the meeting, there was no ongoing follow up and feedback. In many cases the stakeholders may have gone to the next evaluation or planning forum, without any interactions in the meantime.

Interviewees reproached the MoANR top, as they not provide additional funding required for intensive collaboration. Another woreda level AGP coordinator described the following situation:

> Councils only function in the AGP project areas, and yet few meetings are organized because of a lack of budget. For example, in 2015 there was no budget from AGP, as the program was in a transition time to the next phase. That year, we only had one meeting.

Council meetings occurred less frequent than intended but were also not very inclusive. Government officers outnumbered other participating actors, steered and tended to dominate the discussions. DAs, for example, felt that researchers and administrators were dominant. In such an environment, there was little discussion and particularly farmers felt uncomfortable in expressing themselves. Participating farmers noted they:

> "*just attended*" or felt they only had the responsibility "*to put certain Kebele level problems on the agenda*".

Reasons for the unbalanced discussions were several. First, facilitators lacked the expertise to properly steer the meetings. Second, the unbalanced representation discouraged NGOs, private actors and, especially, farmers to really engage. Third the council agendas were more or less set by national development targets. This limited broader discussions, developing an open inventory of key problems, and thus, the real engagement of many actors. Overall, ADPLAC was not able to tackle the main constraints that RELC and REAC had run into earlier: weak interactions and linkages.

4.2.3. Institutions

In the perspective of most government officers, the councils enabled actors to get used to interactive problem solving and articulating problems and solutions. A research official remarked:

> considering the poor cooperation and lack of integration we have; the councils are somehow helping to improve the culture of collaboration.

Apart from this, the council meetings brought a new culture in which researchers were expected to present research proposals and get feedback on the research outputs. However, the envisaged bottom-up communication and planning were limited. A few officers of Agriculture and Rural Development offices noted, concerns expressed by Kebele committees were discussed and considered. An AGP focal person explained:

> Some of the Kebele committee members participated in the council meetings at Woreda level, so the issues for discussion also came from the grass roots.

ADPLAC introduced a routine of knowledge sharing to identify and prioritize (mostly technical) problems in line with the national development targets; allocate tasks to those actors able to contribute to the solution and appreciate the activity reports. Yet, this is not exactly what the theory of inclusive innovation envisions. Interviewees noted there was no critical exchange of concerns, nor balanced sharing of perspectives for joint identification of core problems and desirable solutions. Several respondents underscored the predominance of top-down planning and agenda setting. A government officer described the situation thus:

> depending on the season, there are always agendas prioritized by the governments at each level (national, regional or Woreda); such as soil and water conservation, irrigation, harvesting. Then based on those agendas, there was open discussion in the ADPLACs.

However, most participants displayed a meek attitude and low engagement for the proposed planning and research agenda. Some researchers complained that:

> *they would have appreciated some critical discussion to improve their research questions and enhance the quality and relevance of their research. It would also create engagement and motivation to collaborate on a trial or new development activity.*

ADPLAC remained primarily a planning instrument. Some actors received some tasks, while the others diligently waited for the upcoming activity reports, rather than truly engaging themselves in collaborative trials, monitoring and execution.

So, what were the causal factors for the limited changes in the practice of planning and development? First, most of the interviewees ascribed the persistence of top-down planning, limited discussion, and shallow engagement routines, to the general lack of knowledge about inclusive innovation. Actors were not aware what active listening and the serious consideration of all stakeholder knowledge and concerns would imply. Secondly, respondents mentioned the ingrained hierarchical culture. Facilitators, as well as ordinary council members, were accustomed to focus on concerns of higher level authorities, rather than to forward their own. Many respondents agreed they did not take the ADLAC responsibilities seriously, as there were few incentives. Some GO interviewees also noted their boss did not value, acknowledge and reward council-related activities as much as other assigned duties, hence their active engagement did not provide better career opportunities. Furthermore, though originally envisioned, there were no monitoring and evaluation mechanisms put in place to ensure accountability. A high official noted:

> *there is no such thing as a responsibility without accountability … … (yet) there is no mechanism in place to make people accountable for their actions, so people are only focused on the tasks that are going to be evaluated by their bosses.*

Thirdly, there was a lack of resources allocated for training and the proper execution of the councils' envisaged tasks. Facilitators were not trained and did not know how to steer communication patterns in a more inclusive direction. And last, but not least, the authority and numeric predominance of government actors in the council, out-crowded and discouraged the participation and interest of other council members.

4.2.4. Infrastructure

Regarding the infrastructure, the councils did contribute to some resource mobilization and a more coordinated and efficient use of human and material resources. Some respondents from the GOs reported that ADPLAC helped to mobilize the resources and expertise of some actors present at the meetings, although this was mostly related to physical resources such as fertilizer, improved seeds and other agricultural technologies. There is no evidence that council leaders actively sought to mobilize additional financial resources for training and the execution of ADPLAC activities. As mentioned above, respondents attributed the limited investment in innovation infrastructure to the low awareness and interest of various members in the platforms designed to enhance interactive innovation. According to the interviewees, awareness raising to improve the platforms' functioning was not an issue for discussion, nor a concrete agenda point.

Table 3 summarizes the intended and actual contributions, and limitations and obstacles of ADPLAC in tackling various systemic problems.

Table 3. Summary of intended and actual contributions, limitations, and obstacles of ADPLAC in tackling systemic problems.

Systemic Problems	Intended contribution	Actual contributions	Limitations	Constraining factors (obstacles)
Actor related	Identify and bring together actors who play roles in promoting agricultural development	Stimulate and organize the participation of various actors in one forum	Disproportional representation of actors (e.g. limited participation of ordinary farmers, higher learning institutions, private companies and an excessive presence of GOs)	Hierarchal organizational structure of the councils
	Building actors' capacity in:		Limited role in building the capacity of the actors involved	Absence of people (including the facilitators) who were knowledgeable about interactive innovation processes, and who were able to build the capacity of stakeholders
	facilitation and communication effective service delivery			
Interaction related	Building strong linkages among GOs, NGOs, Private companies and other stakeholders and create a conducive environment where all make their contributions to agricultural development	Create opportunities where stakeholders interact for joint planning and evaluation	Interaction limited to planning and evaluation; no coordinated enactment of development	Lack of funding, limiting the intensity of interactions
			Discussions dominated by GOs	Disproportional representation of actors as a result of the hierarchal organizational structure of the councils
				Lack of knowledge and experience, and facilitation skill to steer interactive processes
Institutions related	Enhancing new culture of working.	Help members get used to new practices:	Top-down agenda setting predominated	Majority of the members were from organizations with a culture of top-down planning and accountability
	Shifting the research agenda towards a farmers' frame of reference to increase the rate of adoption of technologies by farmers	Examples:	Limited coordinated/ integrated action	Absence of evaluation mechanisms and incentive to initiate this as career move depends on direct assessment by one's boss

Table 3. Continued.

Systemic Problems	Intended contribution	Actual contributions	Limitations	Constraining factors (obstacles)
	Stimulating integrated/ coordinated action, and establishing a participatory monitoring and evaluation system	Joint problem identification and prioritization of bottlenecks of agricultural production and marketing, Joint planning and evaluation	Limited engagement of actors in research and innovation agenda setting	Lack of knowledge of facilitators and members on interactive innovation processes Limited practical support and emphasis given by the government to supporting linkage /collaborative activities
		Researchers sharing their research proposals and outputs with stakeholders		
Infrastructure related	Mobilization of resources	Small contribution in mobilizing the available physical human and resources, mainly within the GOs. (e.g. improved seeds, fertilizer, expertise)	No efforts to mobilize financial resources to run council activities and/or secure innovation funds	Limited knowledge on how interactive innovations work and what they require
			No efforts to mobilize or strengthen or to create access to knowledge infrastructure	
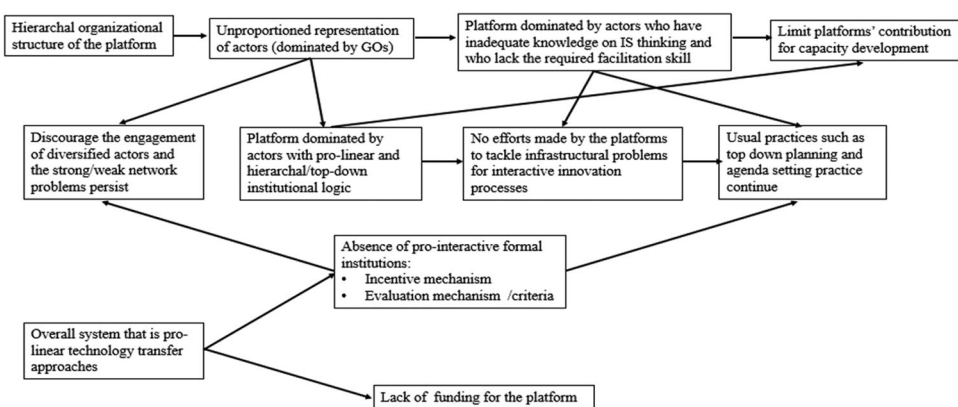
Figure 4. Causal tree diagram of interwoven systemic problems.

5. Analysis and discussion

5.1. How the performance of the state facilitated platform was inhibited by systemic problems

The study shows that the contribution of ADPLAC in building the structural capacities is limited due to the absence of some enabling factors and the presence of several entwined constraints. The first missing enabling factor is proportional representation of all stakeholders. This is essential to enforce the required technical, organizational or institutional changes (Van Paassen et al. 2014). The second missing enabling factor is neutral and capable brokers, which is important to bring the relevant actors together, foster learning, coordinated action, monitoring and evaluation (Nederlof et al. 2011; Swaans et al. 2014). The third missing enabling factor is institutional arrangements that encourage platform facilitators and members to put their newly acquired competences into practice (Schut, Klerkx, et al. 2016).

An absence of formal mechanisms, such as monitoring and evaluation, career incentives, and accountability assurance limited the engagement of actors. Although the platforms were assumed to discuss policy measures needed, these issues were rarely raised in the meetings. Previous studies also report actors' motivations might be hampered by the absence of monitoring & evaluation, or inappropriate incentive mechanisms and mandates (Nederlof et al. 2011; Schut, van Asten, et al. 2016, 2019).

The following are the entwined constraints that put the platforms in a vicious circle, which blocked their functioning as a systemic instrument (see Figure 4).

(1) The platforms were structured and chaired along governmental administrative lines, which automatically led to the predominance of GOs in meetings and decision-making.

(2) The government actors, facilitators included, had inadequate knowledge on IS and interactive innovation processes. This hampered interactivity at the platforms, and the capacity development of the actors involved. These findings contrast with other research on project-based IP initiatives, where delicate facilitation led to a substantive increase in mutual learning and capacity building (Ayele et al. 2012; Schut, van Asten, et al. 2016; Lamers et al. 2017; Mulema et al. 2017; Sell et al. 2018). Understanding of IS principles and skilful facilitation are crucial for success (Cullen et al. 2014; Schut, Klerkx, et al. 2016; Adejuwon 2016). Capacity building of facilitators and IP members is particularly noted as important, when individuals and organizations are not used to collaborating (Nederlof et al. 2011; Mur and Nederlof 2012).

(3) The dominance of state actors in meetings discouraged non-state actors such as NGOs, private companies and farmers from participating. Consequently, the platforms did not improve the interactions and relationships or broaden or diversify the innovation networks. Other research has shown that unbalanced representation and engagement of stakeholders tend to constrain the success of IPs (Cullen et al. 2014; Adejuwon 2016; Schut, van Asten, et al. 2016). A diversity of perspectives, ideas and experiences are crucial for an IP's success.

(4) The dominant institutional logic of GOs remained linear and hierarchical, and its top-down planning and agenda-setting practices prevailed within ADPLAC. The importance placed on meeting national policy targets remained critical for IP

facilitators (Cullen et al. 2014). This explains the limited contribution of the platforms on changing the culture. Other research confirms that it is difficult for IPs to change a predominant top-down planning culture (Sherwood et al. 2012; Van Paassen et al. 2014; Schut et al. 2016). According to a recent study in Ethiopia institutional context favouring the status quo is one of the key issues that need to be considered when building and evaluating effective multilevel IPs to achieve inclusive value chain innovations (Lema et al. 2021).

(5) A lack of funding earmarked for the IP training and functioning was one of the major obstacles. Other research also reports that within other contexts where the ToT innovation logic predominates, there is usually little funding earmarked for training and execution of collaborative approaches (Kristjanson et al. 2009). Our findings show there were no efforts made by the platform members to influence the usual fund allocation and training programmes of the government. As they had little knowledge as to what collaborative problem solving was about, they did not actively tackle the infrastructural problems.

Generally, we can conclude that the platforms' functioning was constrained by the very systemic problems they were supposed to tackle. This is known as a lock-in situation (Patana et al. 2013; Kieft et al. **2015**). Systemic lock-in takes place when interdependent systemic problems sustain each other through one or more closed feedback cycles (Wesseling and Van der Vooren 2017). This means, the framework of Wieczorek and Hekkert (2012) was useful to study the functioning and structural properties of the government facilitated innovation platform ADPLAC, but this study also shows the limitation. The identification of specific functional and systematic problems in a locality is of limited valu0e as it is almost impossible to tackle the identified problems at this level. As Turner et al. (2016) noted, innovation systems have path-dependencies that reflect a certain institutional logic, which is historically and socially constructed and continuously recreated. It is difficult to achieve a radical change in such a logic. To identify measures to overcome this lock-in, the deeper pattern of feedback mechanisms between systematic problems needs to be detected in order that the root cause(s) can be tackled at regime level. In our case, the root causes seem to be the top-down/hierarchal planning culture, combined with the limited knowledge of IS principles. This combination inhibited government officers from demanding and allocating training and funding so that the inclusive platforms could properly function. If they were more knowledgeable and open to applying the AIS principles, the involved GOs could have insisted on training and funding to make the IPs work in order to interact more intensely with a wider network of actors and jointly engage in demand-led problem solving.

We seriously doubt whether, as suggested by Smits and Kuhlmann (2004), one systemic instrument, such as an IP, can orchestrate the articulation of new inclusive innovation routines and induce the development of conducive policy measures. Various studies have shown that non-governmental, project-based IPs were not able to change the well-established linear innovation approach (Cullen et al. 2014; Van Paassen et al. 2014; Schut, van Asten, et al. 2016; Lamers et al. 2017). Our study demonstrates that this is also the case for a government-facilitated platform at the state level. Government actors may have better links with regime actors, to demand conducive policies, but they also share the deep-rooted logic and culture of top-down planning, inhibiting any real

change. As highlighted by Turner et al. (2016), overcoming these interlocked blocking mechanisms requires facilitative measures that are backed up with transformative ambitions and actions at higher levels. Policy makers need to support the transformation of the ToT innovation approach towards farmer inclusive, interactive approach, through providing adequate resources, conducive M&E systems, career incentives, etc.

In a context where the state plays a key and dominant role, it is questionable whether governments are willing and able to support a more farmer inclusive, interactive development approach; as they may feel that this threatens their mandate, oversight and control over the development process. In the case of Ethiopia, the government was deeply committed to agricultural development and created ADPLAC to improve inter-action but shied away from devolving discretionary power and resources to local government and other authorities, and also did not establish bottom-up accountability mechanisms. The Ethiopian state and ruling party structure are deeply intertwined, and apart from agricultural growth, they have a deep interest in retaining political control. To ensure their political support base, they require loyalty from government officers and use extension advice and input cooperatives as instruments of patronage (Berhanu and Poulon 2014). The hierarchic culture is such that despite the rhetoric and half-hearted actions for decentralization and participatory development, local officers tend to obey 'orders from above' and give a high priority to meeting national policy targets (Cullen et al. 2014). As a result, top-down government plans dominated the ADPLAC meetings, crowding out market-based and civil society actors who did not have an equal voice or decision-making power (Spielman et al. 2011; Cullen et al. 2014). Though the nature of the central state and local authorities differ amongst Sub-Saharan countries, central governments are broadly resistant to local democratization and the decentralization of powers (Ribot 2003). There is fear of losing political control, becoming dependent on the whimsical preferences and actions of local authorities and not being able to achieve the national development targets (Ribot 2003).

There is a clear tension between normative theories of inclusive sustainable development, and how theory-driven interventions work out in practice (Ribot 2003). IPs expose and influence power structures. *Ex-ante* appraisal of historic pathways of political-economic development, may show the contours of what types of intermediation and democratization may be acceptable in a governance context. Awareness and consideration of regime actor concerns is essential when designing systemic instruments for IS transformation.

6. Conclusion

The purpose of this article was to explore the role of a state-facilitated multi-stakeholder platform as a systemic instrument to build the capacity for inclusive agricultural IS in Tigray, Ethiopia. Multi-stakeholder IPs are often proposed as a systemic instrument to build the structural capacities of the Innovation Systems (IS): skilful actors, broad linkages and interaction, innovation conducive institutions and infrastructure. Non-governmental, project-based IPs often have limited impact, as they are not well-embedded. Our study of a state-initiated IP (which is relatively well embedded) also revealed a limited impact. This is due to the absence of some important enabling factors such as proportional representation of all stakeholders, neutral and capable

brokers and institutional arrangements conducive for interactive planning such as participatory monitoring & evaluation and incentive mechanisms for government officers to invest in participatory processes. It is also due to the presence of several intertwined obstacles such as the government-led hierarchical structure of the councils, a culture of top-down planning and agenda setting, limited understanding of IS principles and lack of funding of the facilitation of interactive multi-stakeholder processes.

Overall, the systemic problems that the IP was supposed to tackle were interlocked and greatly constrained the functioning of the platform. This shows that one systemic instrument, such as an IP, is not enough to build local innovation capacity and create conducive policy and institutions. Strategic combinations of IP-facilitating- and complementary systemic instruments are needed to overcome a lock-in and build the capacity for inclusive development.

This paper focuses on structural analysis. To explore the systemic problems in a better depth, future studies can use a coupled functional–structural analysis. This will pave the way to comprehensive evaluation of performance of an IS; and help facilitate the design of a systemic instrument that can address the problems in an integrated manner.

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Appendix. Profile of interviewees and interview types

Interviewees interviewed in groups	Reason for interviewing in group	Interviewees interviewed individually
TBOARD, Extension Head Extension expert at regional level	All of them work for the same bureau, but with different roles; and they have similar roles in organizing the ADPLAC meetings	Federal/national Extension Director TBOARD head
Regional level AGP focal person in TBOARD		Southern zonal AGP focal person Endamekoni Woreda Extension Office Head Endamokeoni Woreda level AGP focal person Ofla woreda Extension office vise head
		Ofla woreda AGP coordinator
TARI Director and researcher	Both work for the same institute and have similar roles in organizing the ADPLAC	Alamata woreda AGP coordinator
TARI Socioeconomic Director manager and researcher	meetings	DAs in Endamekoni, Ofla and Alamata Woredas Alamata Research centre manager and researcher Farmers
A researcher from TARI CIP project coordinator and researcher in TARI	Both are part of an innovation platform of AR project. They were interviewed about AR's IP and ADPLAC at the same time.	participating in ADPLAC
AR project coordinator GRAD project coordinator	Both are part of an innovation platform of AR project. They were interviewed about AR's IP and ADPLAC at the same time.	

Acronyms: TBOARD = Tigray Bureau of Agriculture and Rural Development; TARI = Tigray Agricultural Research Institute; AGP = Agricultural Growth Programme; DAs = Development Agents; GRAD = Graduation with Resilience to Achieve Sustainable Development; CIP = International Potato Centre; AR = Africa Rising.