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*Innovating in collaboration: insights from the implementation of
Integrated Water Management in Colombia*

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Innovating in Collaboration: insights from the implementation of Integrated Water Management in Colombia

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Abstract

This paper addresses the effects of the conditions for collaboration upon the generative mechanisms of public innovation. Those conditions and mechanisms are analyzed within a context (Colombia) where a series of other, country-level conditions create a certain context for collaborative public innovation. Six innovation projects on Integrated Water Management are analyzed looking at how the conditions of collaboration and the generative mechanisms of public innovation operated. Findings are made about how agreement on the problem affects time-constrained innovation projects, about the way the generative mechanisms can emerge, and about the ways a legalistic mode of governance influences public innovation.

Keywords: Collaboration, Public innovation, new public governance, implementation, Colombia, Integrated Water Management, governance mode, innovation networks

Introduction

This paper focuses on answering one research question: Do the conditions of collaboration also affect the generative mechanisms of public innovation? In order to do that, the paper analyzes the implementation of six public innovation projects on water management in Colombia, first looking at the relationship between presence of the conditions for collaboration and the innovation projects' implementation results, and then at the relationship between the presence of those same conditions and the

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development of the generative mechanisms of public innovation, as they are conceptualized in Ansell and Torfing's logic of NPG (C. Ansell & J. Torfing, 2014).

It is important to stress that the 'results' to be discussed and linked to the conditions of collaboration are not those of the public innovations themselves. The interest is on analyzing the results of the innovation projects, aimed at developing in detail and implementing the public innovations. Those implementation projects have normally a shorter lifespan than policy developments than can normally evolve for several years until a first appreciation of their results can be made.

Also, when looking at implementation, the focus will be on the completion of the tasks of the public innovation projects more than on any measurements of the results. There is no consensus among implementation scholars about where implementation starts or ends exactly, and therefore about what to measure when studying implementation (Hill & Hupe, 2008), but the more basic way to explore it is by looking at the completion of the tasks that were expected to be performed -in these cases, the implementation of the projects as such (for example Okma et al., 2010; Pressman & Wildavsky, 1984; Vancoppenolle, Sætren, & Hupe, 2015).

The paper is divided into six sections. After this introduction, section 1 presents the theoretical framework used in the research, while section 2 describe the methods used. Section 3 introduces the cases to be analyzed.

Section 4 shares the analysis of the relationship between the presence of the conditions of collaboration and innovation projects' results, while section 5 addresses the relationship between those same conditions and the generative mechanisms. Finally, section 6 includes the discussion of the findings and some reflections and ideas for future research.

1. Theoretical framework: collaboration and public innovation

The main concepts guiding the research are those about the conditions for collaboration identified in the collaboration literature, and the conditions for public innovation as identified by Ansell and Torfing's (2014) *logic* of New Public Governance.

Conditions for collaboration

Acknowledging the existence of the 'collaborative advantage' (C. Ansell & J. Torfing, 2014; Huxham & Vangen, 2004; Lasker, Weiss, & Miller, 2001) what are the conditions for successful collaboration? There is some consensus on the literature about a number of them: trust (Ansell, 2007; Faerman, McCaffrey, & Slyke, 2001; Imperial, 2005);

leadership (Faerman et al., 2001; Huxham & Vangen, 2000); interdependence (Ansell, 2007; Faerman et al., 2001; Imperial, 2005); an number of actors (Faerman et al., 2001; Pressman & Wildavsky, 1984). A shared understanding of the problem is indeed present in the collaborative governance literature (Ansell, 2007; Huxham & Vangen, 2004), specifying the need for a common problem definition, but in a way consistent with a large literature on policy implementation about 'agreement on goals' -e.g (Van Meter & Van Horn, 1975).

Those are the conditions whose presence in the projects was measured for this paper.

Public innovation

There is a growing interest on bringing innovation also to the way we deal with public problems, with a demand for innovative policies, services and forms of organization (C. Ansell & J. Torfing, 2014; Moore & Hartley, 2008). In several countries the State is devoting considerable amounts of resources to nurturing not only business, but also social innovation, as well as trying to innovate itself, both at the national and at the local levels (OECD/Eurostat, 2005; Vries, Bekkers, & Tummers, 2016).

Ansell and Torfing (C. Ansell & J. Torfing, 2014, p. 6) affirm that 'public innovation may transform policies, organizational processes, public services or even the entire way that we think about and position the public sector' with respect to society and the economy. They also offer a series of reasons why innovation needs collaboration: the likelihood of resistance to innovations that are perceived as imposed, the importance of cross-fertilization (C. Ansell & J. Torfing, 2014, pp. 9-10).

If it's conceived as a process of bringing multiple parties together for the creation of public value (C. K. Ansell & J. Torfing, 2014, p. 10) , public innovation is *by definition* collaborative. This should represent an advantage when it comes to dealing with every innovation's adoption challenge: the more collaborative the process -and here co-production should be the optimum- the more legitimate the results on the eyes of those who are expected to implement the innovation.

Generative mechanisms of innovation

The main argument in favor of collaborations in what Ansell and Torfing (C. Ansell & J. Torfing, 2014, p. 14) call 'the NPG logic of innovation' is their capacity to cultivate the three 'generative conditions' of synergy, commitment and learning leading to public innovation. *Synergy* is about bringing complementary resources-those of the different collaborators- together to provide greater value. *Learning* is favored in collaboration through learning in the interaction with others, changing the collective sense of possibility and generating new ideas. Commitment is perhaps the most evident gain achieved through collaboration: It is easier to build support for an innovation if some ownership about it is built in the process (C. Ansell & J. Torfing, 2014, pp. 11-12).

Innovation networks

Innovation are often carried out by networks of actors/organizations, making aspects that are relevant in network dynamics, like collaboration and its conditions, relevant. The concept of innovation networks (Camagni, 1991; Keast & Hampson, 2007) helps focus on the actions of the sets of actors that were on charge of the development of the innovations in each one of the cases. Those actors would not simply put in place an already decided-upon public innovation, but they would also shape it in several ways for their specific contexts, and in none of the cases was it expected that a single network member would make all decisions on its own.

However, those innovation networks are not conceptualized as necessarily 'social' networks through which learning *will* occur rather naturally (Powell, Koput, & Smith-Doerr, 1996; Sternberg, 2000). In these cases the innovation networks were mandated (E. H. Klijn & Koppenjan, 2015) i.e, created by a managerial decision that some organizations should take part in the innovation project, be it because they had Governance responsibilities -like the regional environmental agencies- or because they had specialized knowledge, like the universities. Innovation networks can also be active for smaller periods than governance networks are, when they are only created in order to develop/implement the innovations.

2. Methods

To answer the research question, the research was divided into two phases: first the analysis of the influence of the different conditions for collaboration upon the results of those collaborations, measured by the pace of their implementation. Then in the second phase the analysis of the relationship between the presence of those conditions for collaboration and the development of the generative mechanisms of innovation: synergy, learning and commitment.

Easiness to access information was the main criterion to choose these cases, all being related to the implementation of the same umbrella project, known informally in Colombia as Project Netherlands due to the role of the Dutch Government in financing it. Doing it, however, allowed for a most-similar case selection strategy (Gerring, 2006) where several potentially differentiating factors can be assumed to be similar for all cases.

For the first phase, the hypothesis (H1) is that problem structure can largely explain the variation in implementation results between the innovation projects, since in collaborations it should be more relevant than leadership, and also that number of actors. This last statement is based upon the expectation, given social construction of reality (Berger, Luckmann, & Zifonun, 2002; Hisschemöller & Hoppe, 1995; Hoppe, 2010a), that problem descriptions are neither automatically reflecting 'one' reality, nor automatically reflecting as many takes at that reality as actors are in the collaboration, but social constructions that can be shared or not.

The analysis of these conditions started by calculating the ratios between actual and estimated times of completion, comparing the periods in the projects' terms of reference to the project completion act and the project progress reports delivered to Project Netherlands' central team, and discounting time when the projects were suspended at some point by the parties.

In two cases where the innovation projects were delivered without being effectively completed -the Chinchina and Pamplonita catchments- a 0.3 factor penalty was applied in order to provide a more realistic account of the implementation pace, making for example a 68 per cent delay -the Chinchina case- 88.4.

Once those ratios were calculated and implementation pace identified for each of the six projects, a comparison was made of the relative presence of the above –mentioned five conditions of collaboration, identified in the literature, looking at the relationship between their presences and the results of the projects in terms of pace of completion. All of the conditions were continuous, but observations of them were dichotomized into high/low levels (Gerring, 2006).

The analysis included 175 umbrella-project and specific-project documents, facilitated by the different parts in the projects. Twenty-six semi-structured interviews were conducted to staff of those parts.

The conditions in this analysis were dichotomized into high or low levels, according to the coding of the interviews and the documents in all the cases except the 'number of actors' condition (see Annex 1 for the coding protocol). For number of actors, 1-6 were considered to be 'low' values and quantities starting in 7 would be high. This was possible because the maximum number of actors in a project (12) and the minimum number possible (1) were easy to observe.

For the other conditions, a pre-established cross-over point could not be identified from the literature nor was it easy to observe how many of them there were until after the measurement, something that could bias the measurement. Therefore identifying ratios between observed high and low values of the conditions observed in each case was chosen as the procedure to follow. For example, one observation of high and two of low problem structure would be coded as a 1:2 ratio in a case. These observations were compared to responses about the conditions in the interviews, and when they did not match –less than 25 per cent of the cases- priority was given to the latter in the interpretation.

Finally, the results for each condition, and for configurations including it, were analysed. Configurations, as combinations of conditions for specific cases (Ragin, 2008; Ragin & Rihoux, 2009) allow for the observation of the combined effect of a group of conditions in situations when there are theoretical arguments to expect that no condition individually can explain the results.

We can affirm that in the worst case (water districts) a negative configuration of low problem structure, low trust and low perceived interdependence was present,

explaining the especially bad results, whereas in the best case (Cauca River) a positive configuration of trust -especially between the key actors-perceived interdependence and a higher level of problem structure seems to explain the results. Both the best and all the intermediate results -delays between 39 and 102 per cent- had configurations where trust with high, and trust was only missing in the two worst results, the Chinchina case and the Cauca River case.

All in all, the critical components of the best performances were high trust -that at least allowed to prevent disaster and could be considered a sufficient condition of good performance for these innovation projects- and high problem structure, that was the only necessary condition for relatively good levels of implementation pace. Neither number of actors nor leadership or even perceived interdependence are essential elements when explaining the results.

For the second phase, the hypothesis (H2) is that, since public innovation has been conceptualized as inherently collaborative (C. K. Ansell & J. Torfing, 2014, p. 12), it can be expected that the same conditions needed for collaboration will also influence the development of public innovation through its generative mechanisms. This is still to be observed empirically, however.

The analysis of the development of the three generative conditions proceeded through a new revision of both the project documents and the semi-structured interviews to find references to learning, synergies and the development of commitment among the parties. Here there was no attempt to ‘measure’ their presence as compared to any theoretical expectation, and there was no point in trying to compare their relative influence since they have been conceptualized as links in a process. Very broad categories were established: no developed for no observation of the operation of the mechanism or of activities that could ignite it, minimally developed when only activities in that direction, but not operation of the mechanism is observed, partially developed when at least one or a few cases of operation of the mechanism are found and finally completely developed when several observations of its operation are made.

Interest was put into identifying all the examples that of the mechanisms that were possible from the interviews and the coded documents, and then compare their relative frequency between the cases.

Those relative frequencies of the generative mechanisms were at the end compared to the presence of configurations favouring collaboration, to establish whether there was a relationship between the presence of the conditions and the development of the mechanisms.

3. Six cases in Colombia

Collaborations do not occur in a vacuum. In these cases, they occurred within a specific political system, Colombia’s representative democracy. A country with around 45 million

inhabitants, almost 200 years of self-ruling (1819-) and elected governments throughout almost all of that period, with only a four/year interruption (1953-1957).

Some of the contextual criteria that have been conceptualized as relevant for the flourishing of collaboration are present in Colombia nowadays, namely a democratic government, a rather strong civil society and a strong decentralization. On the other hand, some of the factors that could lead to failure in collaboration are there: clientelism, non-consensual democracy and low trust.

In almost 200 years of independence, only two Colombian governments have been considered dictatorships, those led by general Rafael Reyes (1904-1909) and general Gustavo Rojas Pinilla (1953-1957).

Regarding civil society, Colombia has rather high levels of participation, at least according to recent measurements in the World Values Survey (2014): Colombian levels of participation, especially active participation, are similar or higher than those in The Netherlands, including in political parties, labor unions and environmental organizations -but not in sports! (see Table 1). Looking at participation as an indicator of civil society strength it may be expectable to have high levels of collaboration in Colombia.

There are no obvious sources to look at for a decentralization index. In this paper, Ivanyna and Shah (2014) aggregate decentralization index is used. It is in fact a composed index incorporating sub-indexes on relative importance of local government, security of existence of local government -how hard are they to be disregarded by higher level authorities- and fiscal, politic and administrative decentralization indexes. Colombia is in the low levels of the ranking, with an average result of 5.23, is well below the United States (14.19), but clearly above the Netherlands and Germany (3.81 and 4.86 respectively). If it depends on decentralization, public innovation would find fertile ground in Colombia -and indeed, there are numerous stories, in policy fields ranging from Education to Drugs or Telecommunications, of initiatives borne and grown in local governments.

Table 1.**Enrollment in civic organizations, Colombia and The Netherlands**

	Colombia		Netherlands	
	Inactive	Active	Inactive	Active
Sports/recreation	12.2	16.7	9.3	36.4
Arts/music/education	9.1	4.8	8.5	2.8
Labor union	5.4	2.4	15.4	3.3
Political party	6.7	3.6	4.4	1.2
Environ. Organization	6.8	9.5	9.8	1.0
Professional association	5.7	8.5	7.5	1.9
Human/charitable	6.3	7.8	12.9	3.0
Consumer org	4.6	3.3	10.3	1.6
Self-help group	5.5	9.1	1.8	1.3
Other	1.8	4.2	1.4	3.5

Source: World Values Survey, 6th wave (2012)

What social-level factors could hinder collaboration? A first one is trust. In 2015, 25 per cent of Colombians affirmed they had ‘some’ or ‘much’ confidence in their Government (Latinobarometro, 2015), compared to 52 percent of the Dutch who affirmed they ‘tend to trust’ their Government (Eurobarometer, 2015).

A second negative factor would be the absence of consensual democracy. Colombia is undoubtedly a country with a legalistic mode of governance (Urueña, 2012) if we conceive legalistic as defined by an implementation preference for law, rules and regulations (Howlett, 2009, p. 77). Neither the corporatist nor the networked modes of governance, that draw more on consensus-building, are the preferred choices in the country, and winning elections is largely translated into trying to impose *solo* policy. The ‘regulatory era’ where legal governance prevails, and that Lowi (Lowi, 1972) places in a very specific period of U.S history (1880-1930) has ever ceased to be in Colombia.

Finally, clientelism is known to be a driver in Colombia’s politics, and with it come disincentives to cooperate between those in the clientele of different political leaders.

These country-level conditions, therefore, create mixed incentives for collaboration.

The public innovations in these cases are linked to introduction of a new national policy on Integrated Water Management in Colombia. They included new ways of planning and executing catchment management, of a new and much larger planning unit -Water Districts- and of a new approach to flood-risk management -Room for the River.

IWM policies demand high levels of concerted action between different actors for the allocation and protection of water resources and its ‘related resources’ (Biswas, 2004), using catchments as the ideal planning unit, establishing water rights and fostering the

participation of different groups of users in decision making about water (Giordano & Shah, 2014) and in the Colombian case this included collaboration between different actors even in the first stage of the implementation process (Winter & ren, 2003), when the policy had to be translated to specific actions and regulations in different catchments.

The projects were launched between late 2011 and early 2012 in five different regions of the country and, in one case, at the national level. On average the expectation was to complete the innovation projects -effectively formalizing the adoption of the innovations- in a maximum of 18 months. For one of the projects, the first-time-ever creation of large Water Districts in the country, the expectation was to complete it in 6 months. For another case, the Cauca River Corridor, the time allocated was higher: a little bit more than two years. The main actors and main innovations in each one of the projects are summarized in Table 2.

Table 2.

Main actors and main innovations in the six cases

Project	Main actors	Innovation
Cauca River Corridor Plan	Regional environmental agency (CVC), ICESI University, Univalle University, Dutch consultants, Asocaña-Procaña (sugar cane growers), regional environmental agencies' association (Asocars)	50-year Plan Room for the River Connectivity corridors
Water Districts	Ministry of the Environment (MADS), National Hydrology Institute (Ideam), National Geology Institute (IGAC), consulting firm (UT Macrocuencas), regional environmental agencies' association (Asocars)	Water governance at the water district level, including a number of ministries, government agencies, regional and local governments
Chinchina Catchment Management Plan	Regional environmental agency (Corpocaldas), Nacional University, Ministry of the Environment (MADS), regional environmental agencies' association (Asocars)	Risk analysis Catchment governance councils
Guali Catchment Management Plan	Regional environmental agency (Cortolima), Nacional University, Ministry of the Environment (MADS), Regional environmental agencies' association (Asocars)	Risk analysis Catchment governance councils
Magdalena Catchment Management Plan	Regional environmental agency (CRA), Magdalena University, Ministry of the Environment (MADS), Regional environmental agencies' association (Asocars)	Risk analysis Catchment governance councils
Pamplonita Catchment Management Plan	Regional environmental agency (CRA), UFPS University, Ministry of the Environment (MADS), Regional environmental agencies' association (Asocars)	Risk analysis Catchment governance councils

Source: The author, based upon project documents

4. Effects of the conditions for collaboration upon the implementation pace of innovation projects

Five conditions for collaboration often cited in the literature were compared on their effects in these cases: trust, perceived interdependence, leadership, number of actors and problem structure, the latter understood as not only agreement on goals, but also agreement on what knowledge is relevant to achieve those goals (Hisschemöller & Hoppe, 1995; Hoppe, 2010b).

Interdependence is perhaps the main assumption not only in the cooperation/collaboration literatures (Ansell, 2007; Faerman et al., 2001; Imperial, 2005). And only second to it there is trust (Ansell, 2007; Faerman et al., 2001; Imperial, 2005; E.-H. Klijn, Edelenbos, & Steijn, 2010; Öberg & Svensson, 2002; Rhodes, 1996). There is also leadership (Faerman et al., 2001; Head, Ross, & Bellamy, 2016; Huxham & Vangen, 2000; Sørensen, 2006); and number of actors as well (Faerman et al., 2001; Pressman & Wildavsky, 1984). A shared understanding of the problem is indeed present in the collaborative governance literature (Ansell, 2007; Huxham & Vangen, 2004), specifying the need for a common problem definition, but mostly in a way consistent with a large literature on policy implementation about 'agreement on goals' -e.g (Van Meter & Van Horn, 1975) although with exemptions like Klijn and Koppenjan's 'perceptions' that also incorporate concerns about means (E. H. Klijn & Koppenjan, 2015, pp. 46-49).

In these cases interdependence was observed as perceived interdependence, not assuming that it is there and actors have to discover it (E. H. Klijn & Koppenjan, 2015, p. 74) but observing in the actions of the network actors how much they showed a perception of having it. Leadership was researched as relational ('T Hart, 2014) not looking at 'leadership behaviour' but at leadership as good guidance, therefore observable on its effects on the 'followers' -how much other actors would act following the proposals of a given one of them when they could not be forced to. And shared understanding was observed as problem structure (Hoppe, 2010b; Simon, 1973; Thompson, 2003) with a focus on how much agreement there was between actors in the innovation network about the nature of, and the solution to, the specific problems that had to be dealt with in all steps of the innovations' process -not only at the level of the large goals.

When linking the presence of these conditions to the implementation pace in the projects, the weakest relationship was found for number of actors. Indeed, the subproject with the highest number of them (Cauca River) had the best performance among the six studied. The Pamplonita and Chinchina cases, on the other hand, with small numbers of actors, faced significant difficulties for collaboration and saw standoffs between the regional environmental agencies and the universities that were only

overcome to the extent that the innovation projects could be declared ‘completed’ without really agreeing on the decisions. Indeed the hardest confrontation in the Chinchina project was just between two of the actors, Universidad Nacional and Corpocaldas, about the environmental zoning.

By contrast, the strongest relationship with performance in these public innovation networks was found for problem structure. The case with the biggest proportion of ‘high problem structure’ observations (Cauca River) was also *the only one* with a relatively good implementation pace. This should not be surprising, since collaborations are largely about making joint decisions, and decisions are alternatives chosen to solving problems, yet the collaboration literature has paid much more attention to trust, interdependence and even leadership than to problem structure, as stated above.

There were not just more observations on problem structure, but it is also easy to understand how they affected the progress of collaborations. A good example can be found in the minutes of the second meeting of the Water District’s Strategic Planning Roundtable, one month into a six-month calendar for the completion of the plan, and with a consulting firm already hired for the job for USD 800,000:

-It’s important to first agree on what a strategic plan is. Our experience shows us the need to work on two axes: Conservation and development, and governance. We will have to define what the plan is while we work on it (*National Hydrology Institute*)

-What’s key is reaching agreements (with social actors and other policy subsystems), those may be short-term but with a vision of medium-long term (*Ministry*)

-Is the plan going to be binding? (*UT Macrocuencas, consulting firm*)

-It is (*National Hydrology Institute*)

- It’s not, but we can turn it into a national policy (*National Department of Planning*)

-It becomes binding through decisions of the Water District Councils, and through its impact upon catchment plans and municipal land use plans (*Ministry*)

-There’s no need for just one law. Each of us can produce norms, and also make policy recommendations for actors not represented here (*Corporation for the Development of the Magdalena River*)

When observing the results for *Perceived interdependence*, the central assumption in the discussions about collaboration, observations of it are not clearly aligned with the implementation pace results, since the case with the worst perceived interdependence (water districts) was the one innovation project that collapsed, but the case with best performance (Cauca River Corridor) showed a rather bad performance in perceived

interdependence. It seems to have been key to reach an agreement in the Chinchina case, but not in the Pamplonita one.

With regard to *leadership*, it was high in the best performance (Cauca River) and low in the worst one (water districts), but with no clear role for the others, being high in the Chinchina and the Magdalena Wetlands cases, both with bad performances, for example. In the Water Districts case, lack of leadership by both the consulting firm and even the Ministry was clear, and none of them had the support of other actors in key situations for their proposals.

Things could have been worse in the Pamplonita case had it not been for the leadership of the Ministry. “When we didn’t know what to do they would come with a technical and a legal solution” in words of a Corponor staff member. This is consistent with quotations, where there are only two for leadership, yet both for high leadership.

Finally, looking at *Trust*: It was high in the three best performances -the Cauca River and Guali, as well as in the two intermediate results, Pamplonita and Chinchina, but it was low precisely in the two innovation projects with the worst performance in terms of completion: Water Districts, that was cancelled, and the Magdalena River wetlands in the Atlantic Coast. So we can associate it with better results, up to a point.

A couple of examples of the effects of trust: In the Guali case, Cortolima hired two engineering firms based in the capital (Bogota) that were not known by its staff until then, to provide specific analyses. With one of them, *Emes*, trust started to grow up with every new report, and they were hired for additional work. In the case of the other new supplier, *Interambientales*, “every document they delivered had to be looked at more and more carefully”, according to a former member of the Cortolima project staff. One year and a half after the termination of the innovation project, a big folder labelled *Interambientales*, containing all the communications exchanged with this firm, was still available in the offices of Cortolima’s Planning Department. It was the only one of its kind.

More than by each condition in isolation, however, the results are explained by configurations, as combinations of conditions for specific cases (Ragin, 2008; Ragin & Rihoux, 2009). In these six cases it was the configuration of trust and high problem structure what explains the best result. No other factor is really relevant, including perceived interdependence, which can also be explained by the fact that, being these mandated networks, it would be likely that some actors did not perceive any interdependencies with others. Table 3 summarizes the results of different configurations of conditions and project results in terms of pace of completion.

Table 3.

Configurations of conditions and implementation results for the six IWM innovation projects

Subproject	Configurations	Results
Chinchina	PI, TRU, ps, LEAD, n	88.4% delay
Guali	PI, TRU, ps, LEAD, n	76% delay
Pamplonita	pi, TRU, ps, LEAD, n	102.7% delay
Magdalena wetlands	pi, tru, ps, LEAD, n	105% delay
Cauca	pi, TRU, PS, LEAD, N	39% delay
Water Districts	pi, tru, ps, lead, N	CANCELLED after 100% delay

Source: The author

5. Effects of the conditions for collaboration upon the development of the generative mechanisms

5a. The development of the generative mechanisms

Synergy

Ansell and Torfing expect that actors collaborating will bring together complementary resources or capabilities through synergy (C. Ansell & J. Torfing, 2014, pp. 11-12). They build upon the work of Lasker (Lasker et al., 2001) who indeed identified synergy as *the* unique advantage of collaboration (Lasker et al., 2001, p. 183).

The first mechanism for producing synergic benefits would be creativity, as a result of 'many heads' with different types of knowledge being brought together (Lasker et al., 2001, p. 184). Another mechanism -or a specific form of creativity perhaps- is comprehensive thinking, where partners that would only see parts of a problem if left alone can construct a more holistic view when working on collaborations. Last, but not least, collaborations stimulate transformative thinking, with people and organizations being likely to change when they are exposed to partners with different assumptions and methods of working. (Lasker et al., 2001, p. 185).

Numerous examples of creativity – developing solutions out of the box of the projects’ prescribed activities- are found through the interviews and the analysis of the meeting minutes of the public innovation projects, yet few of them are examples of collaborative creativity, but instead of specific actors coming up with solutions for their problems, without network-level agreements legitimizing them. In the Chinchina case, for instance, the biota diagnose found obstacles because ‘the budget was made by Asocars, and they didn’t take the logistics for biota measurement into account’ according to the former Universidad Nacional team leader. ‘So there was no money for bat-catching nets, or for animal traps. We had to find resources for that. Coming from where? From our people’s salaries’. Also in the Chinchina project, the regional environmental agency found at some point in the process that it wasn’t having all the citizen participation that it expected in the roundup to the creation of a catchment governance body, so it hired a consulting firm in order to organize the workshops and maximize participation.

In the Pamplonita case, it was the university in the network -in this case the Universidad Francisco de Paula Santander, UFPS- who decided to not only integrate a catchment governance body as part of the innovation, but also to train its members - representatives from civil society affected by water problems but not technically trained on water issues. Even MADS was constantly *creating* during the process of these pilot projects -the zoning guidelines were modified four times- but it did it in isolation, not in collaboration with the other members of the innovation networks. It would request their opinions about challenges with the arrangements in place -often through workshops organized with Asocars- but it would make its decisions alone, essentially modifying the framework for the other network members -including the regional environmental agencies- to operate.

There was only in one case -the connectivity corridors in the Cauca River Corridor- where the interviews revealed an initiative actually developed jointly by two members of the innovation network -the ICESI University and CVC.

A relative shortage of actual collaborative thinking may lead to expect low levels of comprehensive and transformative thinking in these cases -and those developments were effectively not reported.

Learning

The second generative condition for innovation that collaborations should nurture is learning. The collective sense of possibility can change and/or new ideas be produced, and although endemic conflict is acknowledged, it may be transformed through reframing and then lead to innovative ideas and solutions (C. Ansell & J. Torfing, 2014, p. 11). Collaborative innovation should destabilize ideologic positions and interpretations of reality, preparing the terrain for the formulation of innovative policies (Agger & Sørensen, 2014). There may be different knowledge structures assigning different meaning to the same information, what Bruner (J. Bruner, 1987; J. S. Bruner, 2009) would call narratives and Gray (Gray & Ren, 2014) schemas, but those differences

can be overcome through processes of transformative learning (Mezirow, 2006) identifying and respecting others' knowledge (Gray & Ren, 2014, p. 138).

What happened to learning in these six innovations? Well, it is not easy to observe from the meeting minutes or the interviews that collaborative learning had been important in these cases.

There are several examples in the minutes of one of the innovation network members submitting a document with 'corrections' that is then approved by the others. Yet the only example of effectively developing ideas together would be that of ICESI University and CVC developing the connectivity corridors ideas, one that was indeed open to more shared learning -this time with the landowners- as specific agreements would be required with each one of them.

In some cases, important network members just were simply not there to learn together. In the Magdalena Wetlands Project, for instance, MADS was almost *never* there:

The most affected were Unimag (the university) and CRA (the regional environmental agency). Asocars would attend the meetings to do the follow-up, but its position was 'you two look for ways to solve the problems'. (CRA staff who participated in the project).

As a matter of fact, frequent Ministry (MADS) accompaniment is reported mainly by actors in the Guali and Pamplonita catchment management projects and the Water Districts case, while in the Cauca River, Chinchina and the Magdalena Wetlands the ministry is reported to have had little involvement. When it did participate, MADS was seen more as 'the response' than as a co-learner. That was the role it played in the Pamplonita and Guali innovations, and also the role it tried to play -less successfully- in the Water Districts innovation network. In that context it found more resistance from the consulting firm, UT Macrocuencas.

The chief hydrologist of the firm, for instance, reports an episode in which a representative from MADS suggested him to change a statement in a report about the inadequacy of the number of measurements available to run regression analysis and model the behaviour of the Magdalena-catchment. 'I wouldn't do that, I'm a professional' he added.

Time was also a severe constraint for co-learning, and this was also more dramatic for the Water Districts innovation.

'We first had the new integrated water management policy, then the normative developments ending with decree 1640/2012 creating legally the figure of the Strategic Water District Plans, then we hired the firm to develop the plan in 9 months, and only after that contract had already started did we know that, in order to develop a similar process for the introduction of the 'Room for the River' approach, the Netherlands had devoted six years to the process'. (National Department of Planning staff).

In order to deal with the scarce time, the Ministry designed very general terms of reference for the Water Districts project, implicitly accepting whatever solutions members of the innovation network could achieve. In practice, however, the same Ministry attempted to impose a defined vision of the project to the consulting firm.

It's important to keep in mind that transformative learning demands appreciation of the others' knowledge. Such appreciation was missing in some cases, noticeably in the Water Districts again, when apart from the critics from MADS, the consulting firm saw its diagnosis questioned by the Ministry of Agriculture at an already advanced moment in the process, because the projections it was making in terms of agriculture growth and agriculture water demand did not match those of the Ministry.

Commenting on the Guidelines for the preparation of the catchment management plans, the perspective from a former project participant in the Guali catchment was that:

although in the workshops with the Ministry they said those were basic minimal requisites to be met, we were later told that they were mandatory. In our internal meetings our technical staff would warn us, based upon their experience, that the Guidelines were not flexible on their application

A last consideration about learning is what happens to pilot projects under a legalistic mode of governance. In the case of Project Netherlands, all the catchment management projects were conceived as pilots to learn from and feed that knowledge back to the norms that were being drafted. But the approach faced two obstacles: first it was difficult to convince some regional environmental agencies to modify their procedures without a legal backup, then when several decisions were being made in 'pilot mode', the new decree regulating the characteristics of the catchment management plans was issued by MADS (August 2012), and around a year after that, the 'mandatory guidelines' were also issued, and several already-finished tasks had to be re-done, like it was the case with the catchment governance councils, for instance.

These pilot projects were precisely that *before* the Guidelines were out. In our case both the agency and the University used to follow the advice of the Ministry as conveyed through Asocars. They had experience personnel, so did us and therefore there was dialogue between knowledges, always trying to abide by the norm, *before* the Guidelines were published (former CRA representative in the project)

Commitment

Ansell and Torfing picture commitment as a *process* through which groups build consensus and support for a particular public innovation. Without commitment, both synergy and learning are likely to dwindle (C. Ansell & J. Torfing, 2014, pp. 11-12). There 'suspicion' is that learning 'may help to build commitment, which facilitates synergy, which feeds back to shape learning' (C. Ansell & J. Torfing, 2014, p. 12).

Yet as described above, there was not much shared learning in most of these projects, and the only process for the creation of commitment was that in the Cauca River project between the CVC and the ICESI University and, to some extent, also between the CVC and the sugar cane growers that blocked the detention reservoirs as part of a process of consultations like the regional environmental agency had not allowed for its plans in a very long time.

5b. The relationship between conditions for collaboration and development of the generative mechanisms

Learning is only labelled partial for the Cauca flood management innovation, where ICESI and CVC developed one important proposal within the plan, the connectivity corridors, together, and there was even some involvement of civil society, although not co-designing but only reacting to the proposals -that's why the learning even in this case is just partial.

In three of the cases -Chinchina, Guali and Pamplonita- learning is rated as 'basic' because the actors took part in the workshops organized by Asocars where the project's challenges and alternatives were analyzed, and at least some debates took place in project committees. In the Magdalena Wetlands there was minimal learning, not even basic, because in that case there weren't discussions leading to learning in the project's committees, just progress assessment exercises. Finally, in the Water Districts case it is affirmed that there is *no* shared learning: the joint creativity that was expected from the innovation network did not emerge, project meetings served mainly to convey positions and not to reach consensus or develop new ideas, nor did the workshops organized by Asocars take place.

When it comes to synergy, the results are even less impressive. Just partially developed in the Cauca case thanks to the Universities-CVC joint efforts and CVC involvement of the sugar cane growers, namely in the connectivity corridors and through their participation in the discussion of proposals, it could have been higher had the sugar cane growers worked together on initiative development with CVC -when in fact they participated in the workshops but created their own technical team to balance CVC's knowledge production.

The not-so-good synergy results in the Cauca case surpass clearly what was achieved in the other innovation projects. In the Chinchina case it is classified as 'minimal' because despite efforts by Corpocaldas to buy information for Universidad Nacional's analyses and its active support of the scheme by the University proposed for the catchment governance councils, there are no reports of initiatives actually developed between the two organizations, nor of any significant synergies between other innovation network members. For all of the other cases, synergy is simply considered not developed.

And finally, commitment: It is considered partially developed in one case: the Cauca River, again. This result is aligned with those for learning and synergy, and it can be said that the CVC, the universities and even the cane growers developed support for at least some of the ideas developed in the innovation network. Cane grower representatives also recognize the importance of CVC 'for the first time' convoking them to discuss possible strategies for the catchment instead of imposing them through norms (narrative interview with an Asocaña representative). This space allowed them to effectively oppose the creation of 'detention reservoir' to use in situations of large flooding.

The Guali case was the first one in which the new catchment management plan was adopted. Even with synergy being inexistent and learning at the basic level, the initial support for the innovation was guaranteed by the only relevant regional player in this case: the regional environmental agency itself, that adopted the new catchment management plan very quickly.

The lack of participation of other relevant regional actors, however, means that their commitment to the public innovation can be expected to be very low.

Table 4 (below) shows the proposed search for relationships between configurations of conditions for collaboration and the generative mechanisms of innovation.

Table 4.
Conditions for collaboration and generative mechanism in the innovation projects

Project	Configuration	Learning	Synergy	Commitment (process)
Chinchina	PI, TRU, ps, LEAD, n	Basic development	Partial development	Not developed
Guali	PI, TRU, ps, LEAD, n	Basic development	Not developed	Nor developed
Pamplonita	pi, TRU, ps, LEAD, n	Basic development	Not developed	Not developed
Magdalena Wetlands	pi, tru, ps, LEAD, n	Minimal development	Not developed	Not developed
Cauca	pi, TRU, PS, LEAD, N	Partial development	Partial development	Partial development
Water Districts	pi,tru, ps,lead, N	Not developed	Not developed	Not developed

Complete development: Several examples of the mechanism in action

Partial development: One or a few examples of the mechanism in action

Minimal development: Mechanism not observed in action, but actions leading to it are observed

Not developed: No observation of the mechanism in action, or of actions leading to its development

Source: The author, building upon the triangulation of interviews and minutes

6. Discussion and reflections

Results shared above provide an answer to the research question: Do the conditions of collaboration also affect the generative mechanisms of public innovation? A relationship was found between the presence of the conditions for collaboration and the results of collaboration in terms of implementation time, as well as between those same conditions and the development of the generative mechanisms of public innovation. It can be concluded that the same conditions that are needed for collaboration are also needed for public innovation.

Reviewing the hypotheses, H1 is *not* confirmed, since Problem Structure cannot explain alone the variation of results between innovation projects regarding their implementation pace. It

is true that the only project where a relatively high level of problem structure was also the one with better results, but it's true as well that it was present together with trust, and that presence of trust is relevant in all the cases except for the two with the worst results.

H2 is confirmed since the same configuration associated with the only relatively successful innovation project in terms of implementation pace is also associated to the only innovation project where at least partial development was found for all of the three generative mechanisms of innovation.

A relationship between the conditions of collaboration and the generative mechanisms of public innovation could be expected, since public innovation has been conceptualized as inherently collaborative, according to C. K. Ansell and J. Torfing (2014). Confirming it empirically through the observation of the only 'successful' configuration in terms of implementation pace being also the only 'successful' configuration of conditions associated to at least some activation of the generative mechanisms of innovation has been important, however.

There was no mechanism conceptualized to understand the influence of the conditions for collaboration upon the actual results of collaborations, and therefore observations in this regard are only of a relationship between the relative presence of the conditions and the implementation results of the innovation projects in terms of pace.

In the case of the generative mechanisms, however, Ansell and Torfing's 'suspicion' of a mechanism can be used as a starting point: learning may help to build commitment, which facilitates synergy, which feeds back to shape learning. In these cases, the difficulties for shared learning to emerge may therefore explain the rather scarce synergies and, with them, the limitations in commitment. Where there was trust and perceived interdependence between actors in the innovation network (the Chinchina case) some minimal development of synergy was possible. But no additional commitment to the innovation was created.

This importance of learning as the starting point of the -collaborative- public innovation process is in line with the observations about the importance of problem structure in explaining the implementation results of the projects in terms of completion time. Specially in the presence of relatively small time allocations, like it is often the case with projects, a common definition of the problems, or at least the capacity to quickly reach one, becomes critical for action.

Respect for other and eagerness to challenge own assumptions are central to both transformative learning and transactive memory systems that are supposed to be operative in the absence of common learning, simply by identifying where the knowledge is (Gray & Ren, 2014, pp. 128-129). Those attitudes could help overcome the lack of common problem definitions among members of the innovation networks, and could be useful in cases like the Water Districts innovation project.

In these cases, however, it is clear that at least the Ministry did not show an attitude generally open to learning from others, and it just made exemptions when it was clear that a close following of its Guidelines would make the whole innovation schemes unfeasible because of

their effects on economic activity. A similar observation can be made about the Hydrology institute (IDEAM) and specially the national Geology institute (IGAC).

These observations do not mean that shared learning cannot happen during collaborative public innovation projects. It is likely however that they will need to be managed, and research into effective ways of stimulating shared learning in these innovations.

And although respect for the others is not always trust, trust as a 'predisposition to cooperate' *does translate itself* into a predisposition to challenge our own assumptions and to respect for others' viewpoints.

It is important to keep in mind that there is also a temporal dimension to the development of these conditions -after all, it is a process. The fact that the 'pilot mode' had effectively ended after the publication of the Guidelines in 2013 halted the learning processes that may have been in place in some of the catchments -like it was attested by the CRA staff in the Magdalena wetlands case- and reduced the impact of that learning upon synergy or commitment. That was not the case in the Cauca innovation, for a simple reason: since it was not a catchment management plan, it was not subject to the Guidelines issued for those plans. And it was also not a water districts plan, so it was not constrained either by the rules applicable to those plans.

Time is *by definition* scarce in projects. A project is defined as 'a temporary endeavor undertaken to create a unique product, service or result' within a defined beginning and end (PMI, 2008). As Grabher (2002) noted, projects are different from long-term collaborations due to their more limited duration in time, and without necessarily being driven by 'rivalry' (Grabher, 2002, p. 246), the interdependencies in project networks -in these cases innovation project networks- have to be investigated rather than assumed, and time constraints will make boundary work and the search for common narratives more challenging.

The governance mode had been conceptualized as one of the higher, country-level conditions for collaboration, while the researched showed us that it did not apply the same to all project since actor in the Cauca innovation project could act less restricted by it. Exploring effective ways of promoting shared learning, even in the presence of legalistic governance modes might be a contribution to the development of the public innovation literature.

Also, the importance of problem structure and the need to actively promoting shared learning -instead of assuming that it will happen- might be considerations to take into account when incorporating design approaches to public innovation. A non-structured problem, when there is little clarity on the means or the ends, is a broad design space. But it can be hard to take advantage from if time is scarce for designing or if shared learning cannot be mobilized. How can design approaches be used in a context-savvy way is another interesting possibility for research in the public innovation field.

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ANNEX 1- CODING PROTOCOL - PROJECT NETHERLANDS CONDITIONS CODING

A. General condition and coding list

Condition	Coding	Example
<p>Problem structuredness</p> <p>“Agreement among a set of relevant actors about the ends and/or means relevant to solve a problem”</p>	<p>High problem structuredness:</p> <p>Reacting to a statement, at least one actor expresses agreement with another actors’ judgement about the common problem addressed in the text/considers it complete, be it with regard to ends or means. No other actor expresses disagreement with the statement.</p> <p>In an interaction, it is clear that all actors relevant to performing a task are certain about how to proceed with it -and that “how” is the same for all of them, they</p>	<p>“Actors A and B approved the presentation by actor C”</p>

	<p>all understand the task the same (07062016).</p> <p>Low problem structuredness:</p> <p>Reacting to a statement, at least one actor expresses disagreement with another actors' judgement about the common problem addressed in the text/ considers it incomplete, be it with regard to ends or means.</p> <p>In an interaction, it is clear that at least one actor relevant to performing a task is uncertain about how to proceed with it. *</p> <p>It is clear that a decision is made to modify a proposal made by one of the actors, even if the proposal was made in a previous moment or separate space.</p> <p>*I will code Low-PS (D) when there's disagreement between different understandings actors have of a problem and how to act about it, and Low PS (I) when none of the actors claims to have knowledge of what they're expected to do. I will also code as Low-PS (I) references to tasks not approved because of changes in the regulations made by MADS.</p>	<p>Actor A approved the presentation by C. However, actor B raised a number of concerns and highlighted issues that should be included in the analysis</p> <p>The decision was made to modify the TORs and the budget approved in the previous meeting.</p>
Trust	High trust:	

<p>“Expectation of a nice behaviour from the other part”</p>	<p>-Reacting to a statement/action by another, an actor expresses confidence on another one’s positive behaviour/commitment/motives</p> <p>_Spontaneous?</p> <p>Low trust:</p> <p>--Reacting to a statement/action, an actor asks for clarifications, warrants, or questions another one’s positive behaviour/commitment/motives (LT)</p> <p>-Actor behaviour is scrutinized by others to test fulfilment of commitments (10/05/2016) LT-A</p>	<p>“When A affirmed to B that this action was enough to achieve what B desired, B accepted A’s word for good”.</p> <p>“When A affirmed to B that this action was enough to achieve what B desired, B raised questions about the effectiveness of the procedure and A’s motives”.</p>
<p>Leadership</p> <p>“Expectation of good guidance”</p>	<p>High leadership:</p> <p>-An actor asked by others to present ideas</p> <p>-An actor is mentioned as example of good results</p> <p>-An actor presents ideas and receives support for them</p> <p>Low leadership:</p>	<p>“Actor C asked the opinion of B, given its experience dealing with similar problems”</p> <p>A was asked to come forward with ideas on the subject being discussed by the others</p> <p>A was mentioned as example of good results dealing with this kind of problems</p>

	<p>-An actor's statements/suggestions are contradicted by others</p> <p>-An actor is presented as example of bad results</p> <p>-An actor presents ideas that are clearly rejected.</p>	<p>D was presenting its plan. F interrupted to highlight the importance of considering another angle.</p> <p>During the meeting, only A, B and C were asked to present ideas. D and F were not.</p> <p>C was interrupted by the others when it presented its proposals.</p>
<p>Perceived interdependence</p> <p>"Perception of of utility depending on another party's own utility"</p>	<p>High perceived interdependence</p> <p>-Actors attend others' invitations to discuss the identified problem</p> <p>Low perceived interdependence</p> <p>-When requested to take action/provide inputs to others, actor do not do what is expected from them (non-approvals due to delay are coded as this instead of low PS)</p> <p>-Actors refuse to do what they're asked to</p>	<p>Attendance lists show that 9/12 organizations took part in all of the meetings.</p> <p>Although their representative agreed to provide information, D never provided the info requested by A</p> <p>During the meeting, D argued confidentiality reasons not to give the information asked by A</p>

B. When to refrain from coding low or high Problem Structuredness

In meeting records there are references to “incomplete” or “non-verified” tasks that could be interpreted as rejection, those references will not be coded in the following cases:

When there’s indication that a product has been delivered, but not that it was evaluated

ADMINISTRACION RECURSOS NATURALES

COMPONENTE	Estrategia para solucionar	Fecha límite de entrega	Responsable	Fecha verificación entrega
Compromisos Administración recursos naturales 14 Feb 2014	Entrega concepto aprobatorio	20 septiembre	CRA	Verificado.
	Pares técnicos: Wladimir Orozco y Germán Escaf, Ayari Rojano			
Acciones a tomar	Se realizó el documento y se enviará copia al correo digital.			

When it is a consequence of a rule-change caused by an actor only partially involved in the projects, but that has authority (MADs). **This cases will be coded as low PS-A (for ample)**

zonificación 14 Feb 2014	Prospectiva			Se puede ver afectado por el ajuste a la guía
	Pares técnicos: Jorge Gutiérrez, todo equipo multidisciplinario			

When what is agreed is the timeframe for future events/future planning

Documento final para publicación del POMCA	30 septiembre de 2014	15/09/2014	UNIMAG
Evento cierre	Desarrollar rueda prensa socialización	Fecha evento cierre convenio 001 y 009 (23 de septiembre Sabanagrande)	CRA-ASOCARS-UNIMAG
Definición fecha para auditoria administrativa y financiera Holanda.	Comunicación oficial y requisitos (Informe financiero)	29 de Agosto de 2014	ASOCARS
	Fecha para auditoría	22 Septiembre 2014	UNIMAG-ASOCARS

When the missing components in a product that cause non-approval are purely of form

Socialización documentos prospectiva, fase	Actualizar las recomendaciones de forma	Miércoles 30 julio	UNIMAG
Documento v mana	Actualizar las		

If it's not clear that a decision/evaluation of a proposal/statement has been made

Compromisos Suelos 02 Agosto 2013	Análisis de estado: Las labores de campo para el componente No se encuentran contratadas a la fecha				
		Contrato elaborado	01 agosto	UNIMAG	
		Contrato firmado	03 agosto	UNIMAG	
		Trámite de recursos de la logística	15 agosto	ASOCARS	
		Actualizar Plan operativo Capacidad uso	09 agosto	UNIMAG	
		Entrega mapa capacidad de uso preliminar	30 octubre	UNIMAG	
		Aprobación técnica del producto con concepto de la Corporación	08 noviembre	CRA	

When it's not clear who was in charge of the task:

		Establecer pares por componente	22Marzo	CRA	No se establecieron
--	--	---------------------------------	---------	-----	---------------------

When it's unclear which organizations are senders/receivers of the messages

Finalmente se comenta sobre la posibilidad de embalses en los tributarios, sobre lo cual Samuel Almeida aclara que los tributarios son quienes proveen de material de arrastre al río Cauca, y que el sector de la construcción es el principal empleador en el departamento, por lo cual embalsar ríos como Timba o Palo que son respectivamente los mayores aportantes de sedimentos, puede alterar la dinámica de producción de sedimentos del río Cauca.