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*Resilience, Adaptability and Transformability in Public Policies and  
the Co-evolving Dynamics of Organizations*

**Title of the paper**

*Organizational resilience, lessons learnt from the Peruvian Ministry of  
Agriculture and Irrigation's response to El Niño 2015-2016  
phenomenon*

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## **Organizational resilience, lessons learnt from the Peruvian Ministry of Agriculture and Irrigation's response to El Niño 2015-2016 phenomenon<sup>1</sup>**

### **Introduction**

In the field of public administration, “organizational resilience” is progressively becoming part of the research agenda. For public organizations, this means that they are capable of detecting, responding and dealing with unfortunate events, assuring the quality of the goods and services provided to the people and strengthening themselves as a system through a learning process. This involves great challenges in terms of prioritizing strategies, key processes and obtaining resources and well-qualified personnel with suitable competencies. The challenge is even greater if considering the specificity of public administration, where many actors hold different shares of power within the system and public managers must comply a legal framework that regulates and controls the organization's operations.

This document analyzes the main factors that affect the capacity of organizational resilience in public administration. For this purpose, the 2015-2016 El Niño phenomenon (FEN, in Spanish) is taken as the scenario for analysis and the Agriculture and Irrigation Sector comprised by the Ministry of Agriculture and Irrigation (MINAGRI, in Spanish), as well as its public entities, programs and projects, is taken as the subject of study. The purpose of this research is to identify and analyze the elements that promoted and obstructed the Agriculture and Irrigation Sector from having a vision, taking actions, recovering and overcoming this phenomenon.

### **Literature review**

From the organizational theory, authors such as Sutcliffe and Vogus (2007), Barnett and Pratt (2000), Woods (2000) and others have used the concept of resilience as an attribute developed by organizations throughout their lifecycle and that makes them capable of surviving crises,

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<sup>1</sup> This paper is based on a study made by the authors under the letter of agreement among the Food and Agriculture Organization and the Pontifical University of Peru. The larger study was published in Spanish in this link: <http://repositorio.pucp.edu.pe/index/handle/123456789/110700>



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threats and changes suffered within the systems to which they belong. According to Sutcliffe and Vogus (2007), resilience is the organizational continuity based on positive adjustments resulting from challenging conditions, which enable an organization not only to emerge from an unfortunate situation but also to strengthen and have more resources available. These challenging conditions include crises, shocks, scandals, tension or interruptions in big or small-scale internal routines, which put the organizational health at high risk.

Rudolf and Reppenning (2002) compare resilient organizations with fragile organizations to reach a definition. For both, the latter is known for not identifying errors and disturbances as elements to be observed within its management model, and thus their organizational performance is most likely to be affected if a negative event occurs. The nonexistence of frequent hazards in the environment may cause that these organizations are not concerned about future events, but they may operate under an absolute predictability logic. Therefore, the authors advise that this causes that people become ingrained to routine work patterns and resistant to change, resulting in fewer surviving possibilities when unfortunate events occur.

With regard to the concept of organizational resilience, according to Lengnick-Hall, Beck, and Lengnick-Hall (2011), there are two different perspectives. The first one refers to the ability to respond from the unexpected, stressful, and adverse and follow its course. For them, this perspective is similar to the definition of resilience from physical sciences, in which the materials are resilient insofar as they are capable of obtaining their original figures and features after being affected by an unfortunate event. In this regard, the authors mention that when resilience in organizations is seen as a “recovering to its original state”, the focus is on formulating strategies that enable an organization to achieve once again its expected results before the disturbance. On the other side, the second perspective goes beyond restoration and includes the development of new capacities to keep organizations afloat and even to create new opportunities. According to this perspective, organizational resilience produces positive effects for the organization as it capitalizes unexpected challenges and makes changes. Thus, this perspective not only assumes that the organization makes a comeback to its original standards, but also that it considers threats as opportunities from which advantages may be obtained towards growth and development.



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For this reason, according to Lengnick-Hall, Beck, and Lengnick-Hall (2011), despite that the definition of organizational resilience has elements in common with the organizations' attributes such as flexibility, agility, and adaptability, all these are different concepts. Firstly, flexibility is the ability of organizations to change in a short time and at a low cost (Ghemawat & De Sol, 1998). Secondly, agility is the ability to develop and take decisions faster (McCann, 2004). Lastly, adaptability refers to the ability to fit in within the environment (Chakravarthy, 1982). Therefore, according to the authors, these attributes defer from the concept of organizational resilience with regard to their source, aim, and effects. For example, resilience is originated from unexpected events, while, both flexibility and agility are part of the planned strategies of an organization. Secondly, resilience means renovation, transformation and dynamic creativity from the within of organizations to the outside. In contrast, adaptability focuses on the organization fitting in the environment and not on how it is reinvented to keep going. Therefore, the authors state that these three elements contribute to resilience, but none of them may individually explain its scope.

On the other hand, Egeland, Carlson, and Sroufe (1993) say that these organizational adjustments to deal with unfortunate events are not implemented only to survive in the present environment, but they also involve a necessity to remain in the future, and that is why new patterns are incorporated, which may even involve changes in their *core* processes. In effect, for Weick y Sutcliffe (2001), the fact that organizations do not rely on success and are vigilant to the unexpected causes them to incorporate the risk within their management model as an element to identify the resources available, measure their actual capacities and make their operations flexible. In this regard, Van der Vegh at al. (2015) mention that resilience in organizations requires a specific organizational structure, and state that the contingency theory suggests that organic structures with higher connection with employees are required in changing environments. In that sense, they argue that this type of organizations (resilient) requires decentralized decision-making structures because the formal roles are not sufficient during crises and new procedures and ways of cooperation are required.

In addition, the authors have investigated the resources, abilities or elements required for organizations to develop resilience. Barnett and Pratt (2000) underline that the most important resources for resilient organizations are the information (in terms of processed data), knowledge



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(team member's knowledge) and technology (seen from equipment or systems that process information or help in the production of goods or services)<sup>2</sup>. On the other hand, according to Sutcliffe and Vogus (2003), resilience results from combining cognitive resources and flexible structures. Finally, Lengnick-Hall and Beck (2003) mention that resilience is constructed from cognitive skills, behavioral characteristics, and context conditions. These authors mention that, firstly, a number of cognitive factors contribute to the creation of resilient organizations. A strong sense of the organization's purpose, values, and vision are one of them (Collins & Porras, 1994; Freeman & al., 2004). Therefore, to the extent that these institutional pillars are related to change, renovation and search for solutions out of traditional patterns, the people in the organization will be prepared and will formulate short-term plans to face a complex and unexpected environment (Cuotu, 2002). For this reason, if the organization has knowledge or methods of work associated with the conventional or routine ways, it will face difficulties to make new plans and transform itself. Secondly, these organizations have employees who display a particular behavior toward solving problems. These employees are used to face difficulties by using creativity and the most valuable resources available (information and knowledge) (Cuotu, 2002). Moreover, these employees are not only known for their analytical skills, but also for being proactive and for formulating plans or making decisions based on the knowledge of other members of the organization. So, given that the information, and so, the construction of knowledge, is changing, this means that the people are known for updating their knowledge permanently. At last, the authors mention that these organizations require particular contextual conditions to develop resilience as psychological safety, social capital, balanced distribution of power and commitment to accountability, and also a wide network to access resources.

In this regard, for Lengnick-Hall and Beck (2003), psychological safety means: 1) that the employees do not feel threatened to be treated as ignorant for making questions or asking for information; 2) that they do not feel incompetent when they ask for help, accept mistakes or decide to try; 3) that they do not think that providing feedback at work is negative; and 4) that they do not fear to ask for feedback because it is a waste of time. Thus, as long as their

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<sup>2</sup> It is worth mentioning that *technology* is a wider term that involves, among others, the techniques, abilities, methods, and procedures for the production of goods and services. However, for purposes of this research, the *technology* variable is being delimited according to the approach of Barnett and Pratt (2000).



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psychological safety is stronger, they will be willing to develop resilient practices. In the case of social capital, the authors mention that this means having harmonious relationships in the organizational community; this means, bonds based on confidence, honesty, and self-respect. This produces multiple benefits for the organization: 1) it contributes to the growth of intellectual capital given that people share tacit knowledge: 2) it integrates the information flows better to the extent that people recognize their interdependency; 3) it strengthens cooperation among the different departments given that people appreciate different perspectives; and 4) it boosts the relationship of the organization with its external environment, creating bonds with other actors. With regard to the balanced distribution of power and the commitment to accountability, the third element for the authors is that resilient organizations are not managed as a hierarchical organization, an argument similar to that of Van der Vegh et al. (2015). In effect, they argue that resilient organizations are self-managed, where power is well-distributed, so individuals and groups become somehow autonomous. In fact, the members of the organization have some discretion to make decisions and, consequently, they assume responsibility for their own actions and results. The last component is the wide network to access resources. This means that resilient organizations stand out for creating strong bonds with other actors, such as the strategic allies, for the purpose of counting on the resources to face contingencies.

Continuing with the research of resources required for developing resilient organizations, we found Weick and Sutcliffe (2001). They state that information is one of the most important resources in resilient organizations, yet it requires skills to analyze it and make decisions based on the evidence. For this purpose, the employees are known for seeking the evidence proactively and evaluating assumptions regarding the risks identified. Other authors, such as Weick, Sutcliffe, and Obstfeld (1999) underline that this kind of organizations is concerned for reviewing their operational performance (short term), tactical performance (medium term) and strategic performance (long term). However, this review can be conducted only through processes of understanding, collection of evidence, identification of problems, evaluation of solution alternatives and revision of the actions taken. That is, the resilience attribute requires that organizations have resources available, but also execute organizational processes, being the knowledge management one of them.



In this regard, Wildavsky (1991) adds that resilience involves investigating, learning and taking actions. Therefore, this author says that the way to resilience is based on past learnings, but regardless of these learnings, counting on people oriented towards the same organizational purpose is essential. In consequence, the author states that, whether knowledge management is a key process towards resilience, it has no sense without the existence of people displaying a problem-solving behavior in which the search for evidence is essential for decision making. Complementary, Sutcliffe and Vogus (2007) state that resilient organizations believe that they may easily face multiple unfortunate events while they make permanent efforts to improve their skills. This means that resilient organizations operate under the belief that they are not perfect, but can improve throughout time by learning from the events. In this regard, the interaction between resilience and the capacities suggest that these organizations are constantly strengthening their capacities.

Finally, similarly, Weick, Sutcliffe and Obstfeld (1999) argue that resilient organizations promote effectiveness, reestablish efficiency and encourage organizational growth through behavioral processes that allow them to develop, clarify and update a shared understanding with regard to the situation that they are facing, define the possible impacts and determine the capacities available so that the unfortunate events may not affect their performance. Additionally, the authors state that these behavioral processes are: 1) preoccupation with failure, 2) reluctance to simple interpretations of the evidence, 3) flexibility in conducting processes, 4) commitment to the organizational success, and 5) capacity to solve problems without depending on other levels of management.

## **Methodology**

### **Research design**

To identify the elements that promoted and obstructed the agriculture and irrigation sector from having a vision, taking actions, recovering and overcoming the 2015-2016 El Niño phenomenon (FEN), and consequently, to analyze its resilience, a case study method was applied. Yin (2014) defines the case study as in-depth empirical research of contemporary phenomenon in a real-life context, especially when the boundaries between phenomenon and



context are not clear. In this regard, Woodside (2010) mentions that the case study describes, understands, predicts or controls a specific analysis unit (a process, an organization or industry, among others).

Among the types of case study, the explanatory case study was applied which is the one that does not only describe the phenomenon but also seeks to understand the root causes behind management practices from the participants in the study. Consequently, this work sought to go in depth in the experience by analyzing testimonials and perceptions of key actors. In this case, the information was provided by medium- and high-level public officials through semi-structured interviews.

Sample selection was a key aspect for systematizing the experience; this means, the people who would participate in the study. Thus, one of the main factors was referred to the representative sample. In effect, in a qualitative study, a representative sample is prepared by understanding the nature of the study purpose (Bertaux, 1993). For this case, the sampling procedure followed three approaches that ensure this representativeness, according to Valles (1997): the socioeconomic approach, spatial approach and time approach.

For the first approach, it was established that the sample must solely be brought the Government officials with medium- and high-level management positions together, as they are decision-makers who have specific responsibilities within the team and organize resources. For the second approach, it was established that solely the agriculture sector organizations located in the City of Lima would take part in the sample due to the purpose of the study. Lastly, for the third approach, it was established that officials holding office on 2015 and 2016 would take part in the sample, as the purpose was to analyze the experience of responding to the El Niño phenomenon in this period. In addition, this sampling technique is the procedure most used in Peru. (Mejía, 2000).

Finally, for estimating the number of participants in the sample, the saturation point was used. According to this criterion, the number of sample interviewees is reached when the information obtained from the participants starts to repeat, getting to a point in which no additional information is added to the problem of the study (Baeza, 1999). Authors such as Bertaux (1993), Baeza (1999) and Miles and Huberman (1994) show that, whether there is not a formula, as in





the case of quantitative researches, it is estimated that between 26 and 30 cases are enough to get to the saturation point.

#### Technique method

The technique selected for data collection was the semi-structured interview. Thus, for conducting the interviews, a questionnaire was prepared. The fieldwork was conducted between February and May in 2016, interviewing a total of 30 individuals. These interviews lasted approximately one hour and a half each, posing questions about the role played by the office managed by each of the participants in the preparation and decision-making during the 2015-2016 FEN.

With regard to the analysis of qualitative information, firstly, all interviews were transcribed. Then, extracts of the testimonials were coded depending on the study variables that have been constructed through a systematization matrix. Finally, all findings were formulated by following a vertical analysis according to each of the study variables and testimonials.

#### Study variables

For this research, study variables and sub-variables were taken from the literature review were used. For this purpose, it started from the contemporary definition of organizations, which understands them as open systems; this means, like «[...] human cooperation systems and in coordination connected within some defined limits to achieve shared goals and objectives» (Hodge & et al., 2003, p. 13). Thus, from an *open system* approach, it is understood that the organization is found in an environment where it takes supplies, process or transform them and then return to it as goods or services. Continuing with this model, firstly, according to Barnett and Pratt (2000), the *resources* held by the organization were identified as an important study variable. According to the systematic approach, these resources are the supplies that any organization needs for conducting its transformation processes. In addition, Barnett and Pratt (2000) underline the information, knowledge (from human resources) and technology as the most important resources, all taken in the research as sub-variables. At the same time, the study also takes the financial resources as a sub-variable in the extent that they are a valuable component for the organization to ensure its response towards disturbances and may continue operating in the future (Egeland, Carlson & Sroufe, 1993).



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The second study variable refers to the *processes*, this means, the way how the organization is organized to transform the supplies in goods or services. Within this variable, other sub-variables were defined following the administrative process logic. Originally proposed by Henri Fayol, these management processes are executed by all organizations in order to achieve their purposes (Robbins, 2012). The five management processes are planning, organizing, coordinating, commanding and controlling.

*Planning* implies setting short-, medium- and long-term objectives, goals, and strategies and scanning the environment. This sub-variable is connected with the literature review, as authors such as Weick, Sutcliffe, and Obstfeld (1999), Rudolf and Reppenning (2002) and Woods (2006) underline that resilience involves a concern towards monitoring the environment, as well as defining action plans depending on the events. Secondly, in the *organizing and coordinating* process, the duties are determined, activities are grouped, resources are combined and the organization is structured in order to achieve the organizational objectives. From the resilience approach, particular attention has been paid to the organizational adjustments arisen from the adaptive capacity; this means, its capacity to embrace the response over its available resources and the activation of capacities (Egeland, Carlson & Sroufe, 1993; Woods, 2006).

Furthermore, the *commanding* process involves working with and through people. According to Sutcliffe and Vogus (2007), resilient organizations believe that they may easily overcome a wide range of unfortunate events. This is the result of decentralized leadership, where the directors empower the members of their team in decision making, and particularly, when directors build a workflow in which employees are concerned for what happens around, the evidence analysis is highlighted, their problem-solving skills without depending on other management levels are strengthened, and above all, the commitment towards excellence is inserted (Weick, Sutcliffe & Obstfeld, 1999).

*Controlling* involves the supervision, comparison and correction actions. In this regard, Weick, Sutcliffe, and Obstfeld (1999) underline that resilient organizations are concerned for reviewing their operational performance in a permanent basis (short term), tactical performance (medium term) and strategic performance (long term). Complementary, Woods (2006) adds that resilience requires monitoring the current organizational model, and if necessary, make adjustments to the model.



Finally, in addition to these management processes, another sub-variable, of high importance for the authors, was added in the *processes* variable. It is related to *knowledge management*. In effect, Wildavsky (1991) mentions that resilience is associated to investigating, learning and taking action and that it is possible through processes of understanding, collection of evidence, identification of problems, evaluation of solution alternatives and review of the actions taken. Additionally, Woods (2006) mentions the desire to spread knowledge and learn from past mistakes when referring to this kind of organizations.

In summary, and considering the foregoing for the processing and analysis of the collected evidence, the study comprises two variables: resources and processes. These, at the same time, are divided into multiple sub-variables. The «resources» variable has four sub-variables: financial, technological, information and human resources. The «processes» variable includes the sub-variables of planning, organizing and coordinating, commanding, knowledge management and controlling. Therefore, the findings presented based on the semi-structured interviews conducted to MINAGRI officials encompass each of these sub-variables.

## **Results and findings**

The results and findings are grouped according to the study variables and sub-variables and seek to understand the elements that contributed or complicated the degree of response of the Agricultural and Irrigation Sector towards the FEN, associating the testimonials with the attributes of resilient organizations.

Resources:

Financial resources

Financial resources are an important asset to face unfortunate events not only in terms of actions to respond to the emergency but also in terms of prevention activities. According to the interviews, it was first found that the MINAGRI allocated budget to respond to unfortunate events such as the FEN, but only when the phenomenon was imminent. In that regard, the participants stated that it was given priority to the resources for mitigating the potential negative effects as reactive management, and not as real prospective management. Therefore, when the



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central government (the Office of the President of the Republic and the Cabinet Office) decided to include the FEN as part of the political agenda, the resources were made available.

Another finding mentioned by the interviewees was that the budget was restricted due to an inertial budget logic; this means, continuing with the resources allocation logic of previous years. Despite this, the MINAGRI determined priorities to define and allocate budget to projects for prevention activities. Also, the officials mentioned that it was difficult to gain access to additional budgets at the beginning of the fiscal year.

Another finding has to do with the low budgetary rules flexibility; in fact, according to the testimonials, it was not only a matter of budgetary restriction, but a low flexibility to reallocate the resources according to the new studies about the FEN and the impacts in the territory, meaning that resources should have been readjusted based on the new evidence on where the FEN was going to hit more and the type of natural disaster these territories were about to face.

#### Technological resources

Resilient organizations are known for recognizing and adapting to unfortunate events, requiring to make adjustments to the resources and technology-supported processes. The participants underlined the need to improve the information management computer systems in the sector (especially those providing broken down information according to the areas) and the systems for monitoring and evaluating the budget used by the sector. In this regard, one of the participants pointed out:

It would be necessary a [single] application between the different sectors [...] in which the information regarding the impacts to the crops, agriculture is registered [...] an integrated information system. That AGRO-RURAL [name of a public entity] should be the entry user, which is the humanitarian aid; the National Water Authority that provides technical assistance; the regional agricultural offices that register the information [...] and you have statistical information and response actions and you will have a record that will be useful for you to integrate... we do not have that (anonymous).

On the other hand, the participants mentioned that better technological equipment was required for obtaining relevant information for making decisions more accurately. In this regard, some participants indicated that the machinery or equipment used by the regional governments and



the executing units required maintenance and renovation. So, they underlined that the senior management must give priority to investing in technology, but more importantly within the sub-national level public entities.

#### Information resources

Resilience in organizations requires quality and timely information to strengthen their internal processes. In this regard, the majority of interviewees agree on the importance of information for better decision-making. In the FEN experience, this resource was not properly provided as there were many actors dealing the information (users and providers of information) within and outside the sector. In addition, according to one of the testimonials, it should be essential to establish parameters, measurement units and standards for information management and action plan to respond to the FEN:

There are domestic programs like AGROIDEAS [name of a public organization] that will not tell you how much budget they have for each district, and the Monitoring and Evaluation Bureau required us that it should be according to each district because the actions to be taken were according to the district. [...] Some do manage information for each district, others at a nationwide level, and others at a province level. That is, it takes so much effort to have it connected. [...] You ask the investment unit, they give you a number. You ask the budget unit, you are given another number. It depends to whom you are asking and you receive a response. This system, especially when it is about beneficiaries, the pattern system must be improved. All the information issue is very complex, [...] Perhaps this is the area that should be more focused on, in establishing standards, guides, how can planning and information systems get improved? (anonymous).

It is worth mentioning that the participants also underlined the effort made by some units of the MINAGRI towards building the information. Unfortunately, the information was not shared at all, resulting in a duplication of efforts. In this way, one of the sector's directors pointed out that it is important to define the contents and roles with regard to the production of information under a provider-internal client logic depending on each office.



In a FEN where any kind of information is required, we still have incipient environmental information. This is not within the scope of the sector, but it is in the ROF [Document of Organization and Functions] because we have an Office of Environmental Studies. But that office does not have the function nor the attribution nor the competences to make statistics. So, are we able or shall we do it? It is a discussion. In the Statistical Plan that I mentioned, the scope of the agriculture statistics is to be defined [...]. Meanwhile, no one defines so. [In addition,] we do not have a specific claim as it is constantly modified. The MINAM [Ministry of Environment] has a statistical office, what are they doing? what are we doing? There is an empty space that must be taken by competences or we shall take action (anonymous).

In effect, the need to establish continuous information flows and the lack of an information storage system was evidenced. The MINAGRI has offices that produce information from time to time, which is one of its strengths. However, the operation of the information flows is not institutionalized (the information flows have been personally requested and as a result of the external issues). Thus, the interviews also show that the information is lost when people cease to work in the organization and it is not systematized and stored in the records of the sector. The problem of information, which is scarce and low quality, is intensified, while the sub-national level governments are the most important providers of information as they are the closest to the territory. In this regard, the participants mention that it is important to strengthen the capacities of these government levels to produce information.

#### Human Resources

Human resources play an important role in resilient organizations as they are, finally, the ones operating the processes to respond to disturbances. Regarding this resource, the interviewees' perception is that MINAGRI had a multidisciplinary staff that was familiar with technical knowledge and also in using information technologies. However, it was observed that the staff was sometimes resistant to change particularly when the new studies about the phenomenon suggested they should change from carrying out a prevention program during rains to one of prevention during droughts.



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This staff's change adaptation was particularly essential to the case officials in charge of implementation as it involved redirecting their projects to areas where intervention was required. It must be noted that working with young staff was advantageous due to their proficiency in information and technologies and quick-access communication (such as WhatsApp), which made decision-making processes easier.

Another aspect pointed out by the General Directorate of the Planning Office was the fact that there is a high staff rotation, which does not allow building a learning curve. In addition to this, there are different labor regulations, which make it difficult to motivate and retain key staff. Regarding the latter, it must be pointed out that there is a persistent sense that the number of staff is inadequate to achieve the objectives, especially when workers are assigned unplanned tasks involving the use of information.

Processes:

Planning process

Since taking action in the event of the FEN is a multi-sectorial matter, the plan formulation involved multiple actors, each one with different priorities. In this sense, when MINAGRI received the assignment to coordinate with other sectors the formulation of the Action Plan to respond to the 2015-2016 El Niño Phenomenon, many challenges emerged, for example: the access to reliable information in terms of investment projects financing and the accuracy regarding those areas where it was going to invest (number of benefited students by school, number of officials by police station equipped, number of medical supplies by rural health clinic, etc.). This is the reason why the interviewees pointed out that the preparation of such plan took longer than expected and did not meet the expected accuracy level, at least not in the other sectors. According to one of the participants:

We failed to meet the level [of adequate information flow between sectors]. We couldn't meet that level [...] because the information in the ministries was widely scattered or was not simply systematized. [...] In other words, coordinating with other sectors to get any kind of information sometimes ..., even to get only information on how much we were going to spend from the budget determined for each district, would take us three or four days. This was not clear to them. Or sometimes, one week they would send us



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budget information and the next week, they would unexpectedly change the information. Interventions were not tallying anymore, and we had to change the document 10 or 15 times. I mean, after having formulated it, we had to update it almost every day and we had to meet up with the responsible persons and the ministers every week in order to discuss the document scopes. There were always discrepancies: *No, I didn't send such information. I did send this one. Who said I was going to spend that budget?* The additional requirements too... The information has been a very critical factor. This was a key element. The timeliness of information, having the information... I want to be honest; this plan was executed approximately from July on. The plan, as it should be, as a document and as an already printed document, already reviewed and consolidated by all sectors, as a definitive plan it was completed on October (anonymous)

Planning for taking action in the event of droughts was carried out only at an agricultural level due to the complexity of making a multi-sectoral plan. In effect, in November 2015, the first drought alerts in the south of Peru were given. And, again, as assigned by the multi-sectoral commission, the MINAGRI was put in charge of the plan formulation without working with the other sectors. The possibility to carry out the planning process only from the agricultural sector was an advantage in terms of speed and fulfillment of activities assigned from the Senior Management of the National Disaster Risk Management System (SINAGERD), declared the interviewees. However, it represented a work overload for them, considering that the regulatory framework assigns a role like this to the National Centre for Estimation, Prevention, and Reduction of Disaster Risk (CENEPRED).

On the other hand, officials emphasized that during the response process, the agricultural sector had to coordinate the Action Plan to respond to the 2015-2016 El Niño Phenomenon with its long and mid-term institutional plans. Testimonials show that this was not an easy task as they had a prevention plan in the event of natural phenomena, such as flooding, landslides, flash floods, and droughts formulated in 2010 by the ANA, the Plan of Risk Management and Adaptation to Climate Change in the Agricultural Sector (PLANGRACC-A) formulated in 2012, the Guidelines of Agricultural Policies approved by Ministerial Resolution N° 0709-2014-MINAGRI, the Multiannual Strategic Sectorial Plan 2015-2021; and all these had to be





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coordinated with the multi-sectoral commission Plan since the resources would be assigned based on the latter document. However, although during the statements it was identified that the multiplicity of plans created confusion between the different dependencies of the agricultural sector, the PLANGRACC-A stood out as the official plan since it was directly applicable to the phenomena as it incorporated relevant regulatory aspects and, thus, it served as a guide for the development of the Action Plan to respond to the 2015-2016 El Niño Phenomenon.

Another aspect mentioned was the complexity of operating within the National Disaster Risk Management System (SINAGERD) to integrate the different plans. Participants declared that the SINAGERD is still a new system and that diverse sectors insert their own plans without considering similar criteria for all of them. Nevertheless, they all agree to emphasize the need to coordinate the (existing and new) plans at national, sectoral, regional and local levels in order to facilitate their implementation (especially regarding prevention). Finally, it must be considered that planning was based on forecasts —probabilities of how the FEN may occur and what may be affected by it—, being the resources allocated based on them. In this experience, testimonials mention that many forecasts were not accurate, making it necessary to update and modify the action plan along the way. This is the reason why, when events were different than expected, the response capacity decreased, especially, at the budgetary level since its formulation included amounts with specific items and in certain areas that were not easily adaptable to changes.

#### Organization and coordination process

Interviewees mentioned that it was through official statements from the National Study of the El Niño Phenomenon (ENFEN) initially announcing an extraordinary FEN similar to the ones occurred in 1982-1983 and 1997-1998 that actions were taken and some legal framework was issued to prevent damaging effects on human life and on the country's economy. One of them was the Executive Decree 045-2015-PCM, which declared a state of emergency in districts and provinces of Tumbes, Piura, La Libertad, Lambayeque, Cajamarca, Amazonas, San Martín, Áncash, Lima, Ica, Arequipa, Cusco, Puno, and Junín during the 2015-2016 rainy season. In this regard, they pointed out that the Emergency Decree 004-2015-PCM appointed the Ministry of Agriculture as the Head of the National Commission of Risk Management of the FEN



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(CONAGER-FEN). Thus, the agricultural sector became more relevant concerning attention to disaster risk management while it was responsible for leading all actions to mitigate the impact of the El Niño Phenomenon.

Likewise, they mentioned that the Office of the President of the Council of Ministers, as the leader of the SINAGERD, was assigned the coordination of transfer of resources to the entities of the three levels of government, focusing on subnational Governments. In this way, by Supreme Resolution 236, the Guidelines and Criteria for Interventions to be executed in the Framework of the Emergency Decree N° 004- 2015 were established. In accordance with said regulations, regions and municipalities have the possibility to access resources after filling some forms. They also pointed out that the municipalities and regions sent their requirements to the PCM (the Cabinet Office) by filling out these forms and a team of professionals who were exclusively in charge of assessing these requirements was assigned. After receiving the team's favorable opinion, the Ministry of Economy and Finance directly transferred the resources to these regions and municipalities. In this sense, for the officials, this regulatory framework allowed having financial resources for prevention measures without overloading the sector's work.

In addition, it is interesting to note that officials from executing units, such as AGRO-RURAL, INIA, and the PSI support that the regulatory framework governing the administrative systems could not be adapted to the disaster risk management. They showed that budget and procurement systems were the most difficult to bear and that they were always monitored by the audit system, accordingly, they had to attend to the tasks assigned by the Senior Management relating to riverside defense and procurement of supplies for agricultural and livestock activities. Also, these units should have answered queries and information requests of the audit system.

On the other hand, the officials affirm that the response capacity was not quick because no guidelines were developed for intervention procedures at the regional and local level; this taking into account that transfer of functions to subnational governments —within the framework of decentralization— is still in development. This way, according to the testimonials of participants, challenges related to working in coordination with the subnational levels still persist, especially regarding agricultural infrastructure (riverside defense). They also added



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that, in the case of subnational governments, it is not yet clear how to take action in advance and that the legal framework that allows the flexibility of administrative systems when an emergency is declared generates perverse incentives among subnational governments as they prefer to allocate resources for repairing activities and not for prevention activities. Additionally, regarding coordination, it was declared that subnational governments, despite being warned about the need to take actions for prevention, they did not take any measure until the phenomenon was imminent. For this reason, they were one of the most difficult actors to coordinate with, and it was difficult to include risk management in their agenda.

Furthermore, responsibilities and commitments were assigned based on reliability (personally), which generated: 1) contradiction regarding the competencies of the dependencies within the sector; and 2) work overload in some dependencies. Thus, some organic units had to modify their traditional roles to respond to the FEN, which implied the availability of fewer resources to carry out their regular activities. Some of the officials even claimed that it was not for their work teams to take charge of the tasks assigned by the Senior Management. About this matter, one of the testimonials says:

Watch out! This general department is a department of monitoring and assessment of a policy or a sectorial intervention. [...] for trustworthy reasons, the minister asked me to safeguard the plan, not only the plan of agriculture, but also one of all sectors. That was the enormous responsibility that I had to assume with the team. [...] Functionally, elaborating a plan is the responsibility of the Policies Department or the Planning and Budget Department, which is finally the instance that always had the strategic *background*. They formulate the plans and gather all indicators of the entire sector, institutional, strategic and daily indicators. Therefore, they, who have also the budget programs, were the ones who were able to make the plan in the end. But the minister decided to assign it to us since this is a trustworthy department for him (anonymous).

Additionally, officials stand out the work performed by the ANA as the governing entity of water resources that made it possible to have a timely response in the framework of the FEN. One of the valued aspects is the fact that the ANA, together with CENEPRED, identified the critical points requiring intervention for the maintenance of rivers, supporting the subnational governments through its decentralized units, also called Local Administrative Water



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Authorities. Another one of the key elements to respond to the FEN were the agreements signed with local governments. In these agreements, the local governments formulated a technical sheet of activity that allowed using the resources of a certain fund in the investment projects related with riverside defense. These files specified the stretch where intervention was going to be executed, earthmoving, equipment to be used and the budget required for the project. Unfortunately, not all projects could be attended through this scheme due to a lack of political will, whose consequence was that the sector's special projects, such as Puyango-Tumbes or the PSI, had to take in charge of these works at the same time, given the lack of actions taken by the subnational governments.

Finally, another highlighted actor in the response to the FEN was the INIA (Agricultural Research and Innovation Institute). Although officials of this executing unit stated that they suffered budget cuts affecting their physical objectives, their work was to establish which crops must be sown and which must not in the context of climate change. In addition, thanks to the production of certified seeds delivered to the regions, it was possible to rescue a part of the agricultural activity that was in the pyramid's base. However, INIA's participants mentioned that, in the event of emergency situations, regions also tend to produce certified seeds, duplicating efforts.

#### Commanding process

It is highlighted that the leadership role of the Minister of Agriculture and Vice Ministers to guide their teams was very useful to execute all the tasks received from the National Disaster Risk Management Council. Nevertheless, direction and decision-making within the sector were not easy and sometimes there were communicational problems at different levels. In this sense, a part of the cost of this leadership involved setting aside temporarily their sector's regulation functions. Thus, from the Senior Management of MINAGRI, it was pointed out that:

The biggest sacrifice mostly involves policy and regulatory matters. Let's say if you intended to create a regulation on how to classify different types of soils in the Amazon, but then you are assigned to take charge of the FEN, you simply cannot create said regulation. Nobody will probably notice it, but as time goes by, this will progressively have an impact because if it is not regulated, regional governments will continue to



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classify the soil with no criteria. When you start executing other activities, you forget your regulatory role. Let's say that, in this matter, I could establish regulations for the regional governments to assess the flood-affected areas so they can explain to me with evidence what happened, in order to avoid sending someone to go and verify [from the MINAGRI]. That is a waste of time. Here we have 10 people, imagine what would happen if 100 areas were declared in emergency, everyone would be traveling all the time. Then, they would have to go and verify (anonymous).

In effect, it is highlighted that the disaster risk management system is not properly working, and it will not while the MINAGRI continues to be assigned to the leading role. In the same vein, the fact that the MINAGRI leads the operating part to respond to the FEN has distracted it from its regulatory role since the Minister had to travel continuously to see the flooded areas or to inaugurate the rehabilitation of irrigation channels. This is the reason why the FEN increased the slowness for approving regulations for the agricultural sector.

On the other hand, the interviewees agree that the political factor has significant influence within the framework of the FEN. In this sense, they point out that after the Minister gave the alert to the President based on the reports forecasting a FEN with an extraordinary degree in April, 2015 —related to the information provided by SENAMHI and the ANA—, the sector received the order to chair the multi-sectoral commission to respond to the climate emergency and to coordinate with the other departments.

Officials indicate that the Minister, supported by his two Vice Ministers of Agricultural Policies and of Development of Agricultural and Irrigation Infrastructure, was able to conduct the process with leadership and ability to handle the unexpected. This is affirmed by an official of the Vice-Ministerial Office of Agricultural Policies:

Yes, it was basically the leadership of the Minister of Agriculture. I mean, somehow the Minister of Agriculture already has that plan [Action Plan to respond to the 2015-2016 El Niño Phenomenon] on the mind, he already knew what it was expected. And about the document, that is a formalism required by the sector, and also by the political instances, the Parliament, the international organizations, that is required [...]. But actually the plan, the expectations of the Government were already known, the expected way to respond to emergencies was already known. [...] it was possible to achieve



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things that have had a positive impact on the sector in the sense that further loss was prevented. Otherwise, nothing would have been done and I think that this should be noted because, in my opinion, this Government has been the most outstanding regarding the amount it has allocated for prevention (anonymous).

In this way, the initiative to create the budget program for disaster risk management (PPR 068) is highlighted as a political factor, linked to the availability of resources for risk prevention, whose financial resources have been greatly increased. At the same time, the interviewees insist on the continuation of this prevention culture for the next Government period and, within this logic, the Minister of Agriculture applied a very intense strategy to disseminate subjects, such as prohibition of building houses in riverbanks or gorges, avoid trash in riverbeds, what to do in case of overflowing of rivers, how to tend to the wounded in an emergency event, etc. All this was led by the Agriculture sector even without being the competent body since that is the role of the INDECI and of the subnational Governments. This sector leadership is evident, in the opinion of the interviewees, as the intense work of the Agriculture sector was highlighted by the media and the regional Governments.

Finally, the interviewees mentioned that managers of each area must incorporate new leadership schemes and make the most of their team members' strengths. This does not only imply better salaries but also an investment in human capital for workers with strong commitment. For this, another challenge is to coordinate with the General Office of Human Resources Management to have a Capabilities Development Plan for Personnel related to disaster risk management.

#### Knowledge management process

The interviewees revealed that there are different methodologies in information management, which generated diverse interpretations of the information and delays in relevance and capability to respond. In this sense, they reported the difficulty to find consistency between the diverse sources of information, especially for planning and budgeting. This was highlighted as officials declare that the lack of standardization, work guides and information complicates the decision-making process and limits the capacity to respond to emergencies. For instance, the testimonial of one of the officials related to the subject of disaster risk management was the following:



We process the information based on damages, affected area or the aid that can be provided. What happens in the Ministry is that [...] each department manages its own information and they do not share it [...], we have to do everything possible to get the information [...]. Regarding agricultural statistics, we already have a good relationship with them to coordinate a figure as they work with a different information methodology and we use another one, so we always use the same formats they do and then we translate them into the methodology required by the COEN [Emergency Operation Center of the National Institute of Civil Defense – INDECI], but we try to make the figures tally [...]. The influence comes from the mayor to the emergency operation center and if they want to do anything, they inform us. There is no mechanism. According to the regulation, the official source is the regional Government [...] The statistics department has a methodology and the INDECI has another one; however, we, as an operation center, try to make the information even... and take that information to match it with the department of agricultural information [...] Sometimes, the information of impacts is elaborated in the SINPAD [National Information System for Humanitarian Response]. The Civil Defense office and the Agricultural Agency do not coordinate and work separately. (Anonymous)

In effect, the interviewees emphasize the relevance of disseminating information within and outside the sector, creating the mechanisms to share it and convert it in knowledge to make it available to take decisions and benefit not only a small group of officials but everyone. This allows creating a knowledge curve at the individual and organizational level.

Finally, most of the interviewees agreed that the knowledge management is key to resilience in the agricultural and irrigation sector since it allows having a source of knowledge oriented to learn from past experiences and replicate good practice. It must be noted that knowledge management does not only require developing an integrated information system but also implementing new instruments, practices and an organizational change around it.

#### Control process

The interviewees affirmed that there were monitoring, assessment, and control mechanisms, but that these must be strengthened in terms of competencies, resources, and instruments to



accelerate intervention and decision-making. In this sense, it is mentioned that there was a team in charge of the assessments, but the results were not shared with all the involved parties, but only with the Senior Leadership Management level (specifically, at the level of the Vice Minister of Development of Agricultural and Irrigation Infrastructure). Nevertheless, considering the information problem across the sector, this process was not easy.

Moreover, the interviewees remarked the obstacles generated from the control system of the Audit Office, which monitored that the delivered products were compliant with the plans, limiting their capacity to be reoriented to new areas that needed them (particularly in the case of materials for agricultural and livestock activities delivered by AGRO-RURAL). In the words of one of the participants:

The public sector is sometimes [...] very rigid. Of course, nothing is written in stone, but there are rules that we must respect. And the problem with the public sector is that if you deviate from the rule, just a little bit, you will have an audit procedure the next month, which does not mean you cannot do it—sometimes we do it—and just for that reason, we are here right now, in an audit prosecution, precisely, for correcting observations for this matter. Anyway, it is our responsibility and we have to do it; otherwise, we would not have been able to reach the people who really needed it (anonymous).

Finally, the officials added that one of the most recurring control mechanisms was the budget execution, which —according to the participants’ perception— should have a results approach across the sector and not only on the executed budget. In this way, efforts from the sector to prepare indicators and develop systems allowing monitoring that could be improved from baselines, surveys, and supplementary field information were written down.

## **Conclusions**

The study about organizational resilience shows that the resource with more impact in this experience was the information, coinciding with the investigations conducted by Barnett and Pratt (2000) and Weick and Sutcliffe (2001). The experience reveals the existence of many actors, within and outside the sector of agriculture and irrigation, who were information users





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and providers, but they used different parameters, measurement units, and standards. Thus, this multiplicity of actors and measurement parameters meant that this resource was not ideally provided during the FEN. This is essential to point out since two of the most important resources for resilient organizations are information and human resources. This is the reason why another important resource standing out in this experience was human resources, in tune with researches conducted by Sutcliffe and Vogus (2003), Lengnick-Hall and Beck (2003) and Cuotu (2002). Regarding them, it is stated that the sector had a multidisciplinary staff, but resistant to change. Likewise, the interviewees stated that the existence of different labor regulations for public officials made it difficult to motivate and retain key staff, generating a high staff turnover, which was an obstacle for the learning processes. In this sense, if the organization wants its employees to be able to solve problems, deal with difficulties in a creative way, be positive and formulate plans or make decisions by using knowledge of other organization members, it is necessary to provide them with particular context conditions to develop their resilience, for example, the psychological safety.

Likewise, the most relevant process found was knowledge management, similar to researches of Wildavsky (1991), Woods (2006), and Weick and Sutcliffe (2001). In effect, knowledge management involves the gathering of information, the codification of information in knowledge, documentation, and the dissemination of knowledge. Related to it, the study shows the difficulty to implement a monitoring and assessment system based on results, going beyond the legal compliance with procedures. In fact, resilient organizations require dynamic monitoring systems to know the situation and progress of the strategic and operating plans. Thus, in order to strengthen the sector's resilience, it is crucial to develop a monitoring and assessment system combining the administrative part with result-oriented programming in order to analyze organization's progress and exploit it for decision-making.



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