

Data ecosystems support for disaster risk reduction (DRR) and resilience at borders

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ABSTRACT

Data ecosystems represent a promising avenue to support Disaster Risk Reduction (DRR) and resilience. Especially in fragmented settings such as cross-border regions, data ecosystems can foster data sharing and regulation among DRR actors. However, recent research has suggested that the creation and maintenance of data ecosystems is challenging. Overall, DRR actors still lack a comprehensive overview of the nature of the impact that a data ecosystem can have on its members. Despite the scarcity of cross-border data ecosystems for DRR, a comprehensive examination of their impact is necessary to support future investments. This research addresses this lack by thoroughly examining the case of the Italian French border. Through a qualitative research design, our research team has been collecting and analyzing data from observations, interviews and focus groups. Drawing on the Theory of Change (ToC), we propose a comprehensive model of the support from a cross-border data ecosystem for its members' resilience. This research contributes to research on data ecosystem in the field of disaster management by highlighting the importance of nurturing data documentation, collaboration and trustful ties within data ecosystems.

Keywords

Data ecosystem, cross-border resilience, Disaster Risk Reduction (DRR), Theory of Change (TOC).

INTRODUCTION

In summer 2023, major mudslides occurred in the Italian city of Bardonecchia, located in the Alps at the Italian-French border, destroying buildings, roads and equipment. The mud waves were so destructive that the authorities were compelled to evacuate more than 120 people. Three years earlier, the Italian-French cross-border region had been struck by the Alex storm, which resulted in the deaths of more than 21 people and caused more than 2 billion euros of damage in Italy and France. As demonstrated here, cross-border regions are especially susceptible to disasters. To become more resilient, e.g. develop the capacity to absorb and bounce back from shocks (Reghezza-Zitt et al., 2012), cross-border regions can greatly benefit from Disaster Risk Reduction (DRR).

DRR aims to identify and prevent disaster risks in several ways. DRR not only allows for the identification of natural hazards and vulnerabilities, but also for the prevention of vulnerabilities and the development of capacities for response. DRR at borders is a major concern for national and international authorities, primarily because cross-border areas represent crucial gateways to global commercial activities. These regions are home to critical infrastructures (such as industrial facilities and transportation networks) that are vulnerable to natural hazards and disasters. The importance of DRR in cross-border regions has been globally acknowledged (Paquay et al., 2021).

Data represents a strategic resource to support DRR (Liverani et al., 2018; Toro et al., 2019). It is essential for identifying, understanding and predicting risks related to disasters, and for tracking collective responses to critical situations (Kothari et al., 2024). Data sharing is essential to DRR because one specific organization cannot produce all the data it needs to analyze situations and make predictions. Thanks to increased connectivity, organizations

can nowadays share data from geographically distant locations, which helps them check or produce information in a timely fashion. Especially across borders, data sharing can support the creation of an overview of disasters' manifestation that cross borders and support coordination of response at an international level (Liverani et al., 2018).

In the latest years, international institutions and organizations have acknowledged the need to support data sharing in a structured and regulated fashion. Data ecosystems represent a promising avenue to benefit from data sharing for DRR and resilience. A data ecosystem can be defined as a network of technologies and people that facilitates collaboration between independent actors to collect, manage, and use data (Oliveira et al., 2018). It is not merely a union of data from the actors, but rather a cohesive, new system, that can foster innovation (Harrison et al., 2012). In the DRR context, data ecosystems can help organizations better represent, identify and prevent risks. Joint Europe Research center has advocated the positive role of data ecosystems in resilience. In the same vein, a large spectrum of international organizations – including the United Nations (UN), the Open Data Initiative (ODI) and the World Economic Forum (WEF) – have been promoting the creation of data ecosystems.

Despite recent momentum, the impact of data ecosystems on their members' resilience, especially in cross-border regions, remains partially known. Given the scarcity of cross-border data ecosystems for DRR, our understanding of data ecosystems' support for resilience boils down to disparate expectations. Given the foregoing, this research intends to address the following research question: *“How do data ecosystems settled in cross-border region can support the resilience of their members from the various sides of the border?”*

To address this question, we have been working on a collaborative qualitative design based on the Italian French cross border case. The Italian French cross border region can be characterized by a strong tradition of collaborative projects, especially on data related to natural hazards. Nowadays, the cross-border region is still missing a data ecosystem, despite DRR actors' willingness to improve data sharing between Italy and France. This study has been relying on three major sources of qualitative data – namely observations, interviews and focus groups – to comprehensively forecast the contribution of a cross-border data ecosystem to its members' resilience. Drawing on Theory of Change (ToC) our analysis proposes a preliminary version of a comprehensive model.

This paper is structured as follows. In the theoretical section we account for the lack of understanding of the nature of the impact of a cross-border ecosystem on its members' resilience. We also argue for our rationale to rely on the ToC to analyze the impact of data ecosystems. The methodology section outlines the variety of data sources and details the research process. The findings section presents the preliminary model that stemmed from data analysis. Finally, we discuss the limitations and the expected contribution from this research.

THEORETICAL BACKGROUND

Data ecosystems for DRR at borders

Organizations involved in cross-border DRR face many challenges to share data in a structured manner. Not only they face interoperability issues (Liverani et al., 2018), but they also need to deal with fragmentation (e.g inconsistencies and overlaps between the two sides of the border) (Kratke, 1999) and lack of trust (Koch, 2018), possibly aggravated by conflicts' legacies (Adrot & Aguerre, 2023). In these settings, data ecosystems represent a promising opportunity to improve collaboration related to data across borders.

In the latest decades, data ecosystems have been developing in multiple sectors, ranging from agriculture (Tamene et al., 2021) to health (Aaen et al., 2022) or even the humanitarian sector (Haak et al., 2018). In the field of disaster management, reflection on data ecosystems is more recent and initiatives remain limited in number, despite their potential. Data ecosystems represent socio-technical sets of organizations that produce, share and intermediate various data sets (Oliveira et al., 2018). Data needs for DRR are particularly broad, which means that there are various type of data producers and users that are involved in such a data ecosystem. Building a data ecosystem for DRR and resilience requires identifying the various data-producing stakeholders, identifying existing data sets, understanding their relevance to DRR, organizing and establishing sharing mechanisms and usage rules for the different actors (Haak et al., 2018).

While there is no restriction about the nature of the data sets, the ecosystems usually share a common objective that defines the scope of data that can be shared. In the field of disaster management, data ecosystems can help DRR actors share and consume data related to all sorts of topics, including natural hazards (for instance real time

location of earthquakes), climate change (such as historical data on past temperatures), demographics (for instance the proportion of disabled individuals in a specific region) or even damages and weather forecast. The members of a data ecosystem can also combine and put into perspective multiple data sets to provide insightful maps and visuals.

Data ecosystems are beneficial to cross-border organizations in at least two ways. First, they help them identify and collaborate with each other (Oliveira et al., 2018), which help them overcome barriers against data sharing. In addition, data ecosystems allow and regulate access to diverse sets of data, fostering analysis capacities and decision-making (Welle Donker & Van Loenen, 2017). In the field of disaster management, the literature has been advocating the idea that data ecosystems can support disaster management (Berens et al., 2016; Haak et al., 2018). First, data ecosystems, by facilitating data sharing and use, can indirectly support decision-making and planning (Zuiderwijk et al., 2014). By sharing the same data sets, DRR actors can more easily co-construct common goals related to DRR, which fosters collaboration and trust among actors (Gelhaar et al., 2021; van Esch, 2021). Also, shared data governance and strategy lay ground for a clear ambition regarding DRR and can help align complex processes, which ultimately allows for more efficient data use (van Esch, 2021). Going further, one could safely assume that data ecosystems foster resilience.

However, support from data ecosystems to resilience cannot be taken for granted. Some data ecosystems, once created and internationally appraised, eventually decline (Aaen et al., 2022). This means that data ecosystems do not comprise positive features only. In addition to data interoperability and safety issues, data ecosystems can also generate conflicts and undermine trust between its members (Aaen et al., 2022). Such difficulties stem from the fact that data ecosystems are not purely technological objects but rather are socio technical (Heinz et al., 2022). Despite some ongoing research on the success of a data ecosystem (Welle Donker & Van Loenen, 2017), the literature disparately outlines promises, benefits and drawbacks from data ecosystems. As a result, we still lack a comprehensive understanding of the impact of data ecosystem on its members.

Going further, the literature on data ecosystems faces two kinds of limitation. First, it has predominantly considered the impact of data ecosystems in business settings. Studies on the impact of data ecosystem in non-economic settings do exist (such as Berens et al., 2016; Haak et al., 2018) but remains scarce and does not examine how data ecosystem support resilience. Second, the literature lacks explanatory power, meaning there is some lack of knowledge on the causality chains between a data ecosystem's features and its outputs. This is unsurprising given that few data ecosystems have been operating long time enough. This means that, practically, policy makers lack guidelines to settle data ecosystems that effectively support resilience. Likewise, organization lack practical guidelines to fully benefit from their investments into data ecosystems. This is a pity as disaster research has, for many years, evidenced the benefits from data sharing and data preparedness, which can be supported by data ecosystems (Van Den Homberg et al., 2017).

Theory of Change (ToC) as a valuable lens on a data ecosystem's impact

In this section, we account for the benefits from adopting the ToC lens to study the impact of data ecosystems on resilience. As explained earlier, existing knowledge does not provide enough theoretical grounds to predict nor manage data ecosystems' support to resilience. While the performance of data ecosystems has been assessed, existing research lacks explanatory power, leaving little explanation of the nature of the impact and its causality. For now, it is difficult to determine the impact of the data ecosystems. Data ecosystems do exist for decades in the industrial sector of activities. However, their relevance for public organizations is more recent. However, Multiple organizations have been promoting the creation of data ecosystems, including the Open Data Initiative, the United Nations (UN). The literature offers some insight on the effects of data ecosystems on their members.

In this work, we define impact as the effect or influence, in its multidimensionality and complexity, that an event (in this case the creation of a data ecosystem) has on people, organizations and other entities involved. That said, the impact itself is not static but can change over time. Data ecosystems are complex socio-technical networks. In our view, ToC represent a valuable approach to the grapple with the complexity of data ecosystems' impact over time.

The Theory of Change (ToC), "*at its most basic, (...) explains how a group of early and intermediate accomplishments sets the stage for producing long-range results*" (Anderson, 2004). In other words, the ToC implies that impact results from an intricated set of situated and temporal factors.

The theory of change can be used in a prospective mode (Connell & Kubisch, 1998) in order to forecast the impact

of a specific action. By breaking down the steps from activities to outcomes and then ultimate impact, this method allows us to reach our objective. It shows how constructing a data ecosystem can lead to a positive impact on disaster risk reduction at the Italian French border. We further detail in the Methodology section how we relied on ToC to produce the model.

METHODOLOGY

Based on a collaborative design, the research process followed four major steps, detailed in Figure 1. Figure 1 reveals that the model was iteratively produced and presents the sources of data used in this study. In this section we first present the case study we relied on and then detail data collection and analysis.

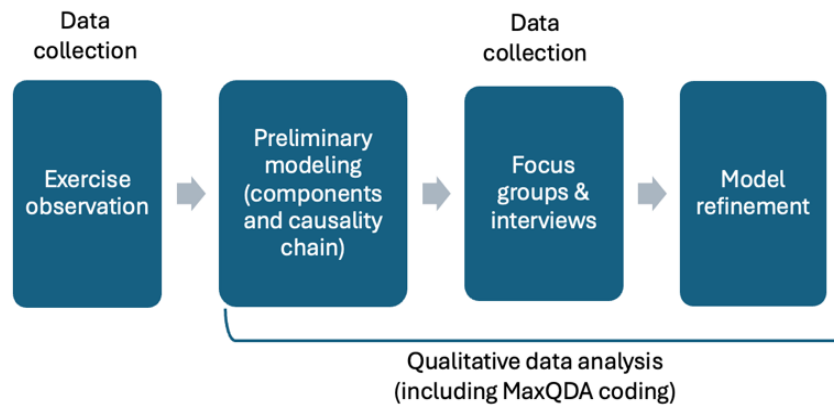


Figure 1. Research process

The Italian French cross-border region as a case study

This work is part of a larger project funded by the European Commission (EC). This project is led by the French Red Cross (FRC) and aims at providing to DRR actors tools and means to improve the Italian French cross border resilience by relying on data. Part of the project aims at anticipating and measuring the impact of a future data ecosystem at the Italian French border.

The case of the Italian French cross-border region is relevant to address the research question for multiple reasons. First, Europe has settled data as a strategic priority. The Data Act and the Data Governance Act reflect a common willingness among the European countries to strengthen their sovereignty over data and modernize their data infrastructures. Moreover, the European Commission has been promoting the notion of data space, which refers to a consolidated data system with shared resources and governance rules. Practically, this means that an increasing number of organizations in Europe (including the Italian French border) have been developing tools and investments in data.

At the Italian French border specifically, the local DRR actors have pursued significant efforts to improve data access and data sharing since a decade. Among the organizations involved in cross-border DRR, some organizations have modernized their use of data in the latest years. In addition, several projects at the Italian French border, including RiskPaca, ConcertEaux and Amis well illustrate the involvement of various public and private into a common search for collaboration over data.

Data collection

We collected data from three primary sources: i) passive observation of an emergency exercise, ii) semi-structured interviews from professionals and experts, iii) focus groups led during an international workshop organized by the team. All the data collected from the three sources was iteratively analyzed.

Cross-border exercise observation

First, we passively observed a simulation exercise organized by the Italian and French Red Crosses. The exercise simulated a critical situation generated by a medicane, a violent climate event that is typical of the Mediterranean Sea and coasts. As in many disasters, the medicane ignores the Italian French frontier. This means that according to the scenario of the exercise, both French department and two Italian provinces are affected by flash floods, like

storm Alex. Preliminary to the exercise, the participants received a short training about data usage, tools and ecosystems. Once the exercise initiated, the participants received instructions to produce, share and exploit data related to the simulated event across the border. The exercise was a relevant opportunity to observe the difficulties experienced by the participants in relation to data production and sharing.

To collect data during the exercise, a shared observation grid has been set up. During this exercise, we observed how the participants used the data and coordinated. This was meant to help track data use and issues that undermined the resilience of the emergency response. It also helped collect data about how information and data was produced, processed and shared.

Transcripts of the practices and interactions related to data as well as the difficulties that were experienced in relation to data collection and sharing were produced. Data analysis section explains how the data collected during the observation was processed.

Semi-structured interviews with experts and practitioners

In 2025, we conducted 5 semi-structured interviews of the stakeholders of the future data ecosystem. We also included 6 other interviews that had been conducted previously in 2024. We used a theme dictionary and an interviewer guide to structure these interviews. We included the key concepts of the Theory of Change (ToC) to complete the second round of interviews. The objective of these interviews was to understand the links between the features of the future data ecosystem and data sharing practices and resilience.

Finally, we used secondary data collected in previous rounds of the research project between 2022 and 2024. A total of 25 interviews on various aspects of the future data ecosystem preliminary to this research were used. Of these interviews, 8 concerned the potential expectations of DRR actors towards a data ecosystem. 17 other interviews explored the obstacles that can prevent the establishment and adoption of the data ecosystem. Indirectly, these 17 interviews helped identify what impact the DRR actors expect from data sharing and, possibly, from a data ecosystem.

Focus groups

Finally, we also conducted focus groups with 12 international experts and practitioners of DRR in 2025. The participants were of 6 different nationalities (Brazilian, Austrian, German, Greek, Italian and French). Workshop's participants were exposed to fictitious scenarios that depicted the output and the short-term impact of a fictitious data ecosystem at the Italian French border. The purpose of the focus groups was to challenge our initial model. By observing the discussions among the participants and leading a collective discussion, we collected data on the likelihood of each stage of the components of the model and the causality between the components.

To build the scenarios the team relied on the data collected from the cross-border exercise observation. The two scenarios used for the focus groups were consistent with each other. This first scenario mentioned the situation that resulted from the creation of the data ecosystem (labeled as 'output' according to the ToC). The second scenario considered the development of the data ecosystem some years after its creation and its short-term effects on its members (labeled as 'short term outcomes' according to the ToC).

The participants were distributed in three multi-cultural groups. Each group gathered experts and practitioners, from various nationalities. Each group was designed to mix the participants and avoid any biased view on the scenarios. Practically, the participants were asked to identify what was likely and unlikely in each scenario. For the first scenario, the participants had to explain what features of the outputs were likely (given that the inputs necessary to the functioning of the data ecosystem existed).

Data analysis

We drew on the Theory of Change (ToC) to analyze the data collected and propose a model of a data ecosystem's support for its members resilience. The components of our model are based on the ToC, namely the inputs, outputs and outcomes of a specific change (change in this work corresponds to the development of the resilience of the members of the data ecosystem). In the model, the inputs correspond to the resources needed to create a functional data ecosystem, the outputs correspond to the features of the data ecosystem, the short-term outcomes correspond to the support from the data ecosystem to data sharing. Finally, the long-term outcomes correspond to the increase of resilience thanks to data sharing, supported by the data ecosystem itself.

We followed several steps to produce the model. First, from the observation, we identified the (short-term and long-term) outcomes of the model. We identified the issues that the participants of the exercise experienced in relation to data and how these issues undermined their resilience. We triangulated the data from the observation

with the literature to infer how data ecosystems inputs and outputs can help mitigate these issues. For instance, we observed during the exercise that the participants did not know who was responsible for accessing and processing the data, which prevented them from using the data on the spur of the moment (lack of data preparedness). We put this observation into perspective with theory to infer that the data ecosystem, by supporting data accessibility (short term outcome) can improve data preparedness (long-term outcome) (Haak et al., 2018). Repeatedly, we produced a first model of a data ecosystem's support to resilience.

We then refined the model into a second version, in particular the causal links between the inputs, outputs and outcomes. We also distinguished short- and long-term outcomes. The long-term outcomes are more uncertain than the short ones and represent a less likely part of the impact.

We challenged this model thanks to the scenario-based focus groups. Based on the insights provided by the participants of the workshop (as well as the notes taken during the workshop), some causality links were deleted from the model or refined. For instance, the team had preliminarily reviewed in the literature that data ecosystem could support the emergence of shared standards related to data. However, the participants of the focus groups questioned this causality link.

The final round of analysis corresponds to the coding of the interviews on MaxQDA. MaxQDA is a software that helps code qualitative data. The coding started after the observations. The coding was collaborative, meaning that each member of the team had access to the empirical data and could create or edit memos. From the qualitative data, we created two types of codes: i) the components of the model, ii) the causality links between the inputs, outputs and outcomes. At each meeting, we challenged our coding through systematic comparison between the model and the empirical data. By doing so, we deleted the causal links between the components of the model that were insufficiently supported by empirical data. The following section describes our preliminary findings.

PRELIMINARY FINDINGS

In this section we present the preliminary findings of this research: an exploratory model of the support from a data ecosystem at a border for their members' resilience. The recapitulative model is presented in Figure 2 at the end of the section. It is important to note that the model still requires refinement, and that coding is still ongoing. Because of space limitations, no verbatim is provided in this WIP version.

Inputs of the data ecosystem

The inputs correspond to the resources necessary to create a functional cross-border data ecosystem. The inputs comprise technological resources (including data sets, but also infrastructure to store data and grant access to APIs), as well as organizational resources (data sharing processes, responsibilities definition, agreements and data governance plans) and human (Chief Data Officers, data analysts, data users, etc.) resources. These three resources are interdependent. For instance, the data ecosystem requires recruitment of employees in charge of maintaining the shared infrastructures and monitoring data quality and accessibility. Finally, a major resource to the ecosystem is the co-construction of shared objectives between the members of the ecosystem, as well the members' agreement on shared rules.

From inputs to outputs of the data ecosystem

The outputs correspond to the features of an "ideal" cross-border data ecosystem. The outputs can become tangible once the data ecosystem is created and functions based on the inputs of the model. The outputs first comprise the access to consistent and well documented data sets. Access to consistent data sets is not easy to achieve and depends on multiple variables, including the DRR actors' willingness to share their data. As a second output, the ecosystem provides cross-border data sets through a shared infrastructure. By cross-border data set, we refer to a specific data set that includes both Italian and French data. The consistency of cross-border data requires the creation of a catalogue of translated and harmonized sets Italian and French data. Third, to grant access to relevant and good-quality data, rules, policy and accountability mechanisms about quality and usage should be effective. This illustrates well the sociotechnical dimension of the outputs in the model. Fourth, as an output, the data ecosystem's employees propose collaborative activities, including webinars, regular meetings and even exercises that allow the data ecosystem members to meet each other and collaborate.

Empirical data suggests that the inputs are crucial to the effective functioning of the data ecosystem. It also reveals that the positive effect of the combination of both technological and organizational inputs on the outputs of the data ecosystem. While the sharing of technological resources supports the creation of new cross-border data sets, the definition of common objectives and the recruitment are also important to the functioning of the data ecosystem. More precisely, collective agreement on rules between the future members of the ecosystem supports

the co-construction of policies, rules, and helps the data ecosystem account for the quality of the data and its usage within the ecosystem. The recruitment of employees supports a regular monitoring of the consistency of the data sets that are accessible in the data ecosystem, as well as the settling and animation of collaborative activities.

From outputs to short term outcomes

The short outcomes correspond to the situation that can materialize thanks to the existence of the outputs. They represent the direct effects of the existence of a functional data ecosystem at the border. First, as outlined by the interviewees and participants to the workshop, the settling of policies, rules and accountability within the data ecosystem positively contributes to the development trustful ties to the ecosystem. By trustful ties, we mean that the members believe in the data ecosystem's capacity to implement its rules and regulate itself. Trustful ties also means that the members of the data ecosystem have little doubts about data usage and quality within the ecosystem. This implies that trust does not restrict to data but rather concern the ecosystem itself. Collaboration and integration of the members within the ecosystem is a second outcome. By integration we refer to shared knowledge of the ecosystem members and a shared vision of the cross-border region. This means that integration goes beyond mere participation into collaborative activities and data sharing. Both collaboration and integration represent major drivers of cohesion within the data ecosystem. A third short-term outcome from the data ecosystem is data literacy. As a third outcome, data literacy refers to the capacity to produce, to understand the data sets produced by other members, but also to put into perspective several data sets (Annika Wolff et al., 2016).

This practically corresponds Regular attendance of the members to collaborative activities not only train them to interact and collaborate. Regular attendance also promotes mutual knowledge between the members and supports a common vision of the cross-border region as a liminal space rather than a separation. Regular collaboration among the members can also ease data usage by helping the members understand the differences in semantic and vocabulary. Finally, both documentation and regular collaborative activities within the ecosystem support data diversification and the diffusion of competencies within the ecosystem.

From short term outcomes to long term outcomes

The long-term outcomes of the data ecosystem correspond to indirect effects on its members, driven by the ecosystem's long-term functionality and the members' continuous integration. This means that the long-term outcomes are more uncertain than the short-term ones.

As illustrated in Figure 1, trustful ties to the ecosystem enable members to remain informed about data usage and the quality of data, as well as the rules and policies within the ecosystem. These ties support long-term compliance with the data ecosystem governance. Collaboration and integration within the ecosystem can foster situational awareness and mutual trust, two complementary drivers of resilience. Finally, the ecosystem members' mutual understanding of data formats and vocabulary supports data preparedness.

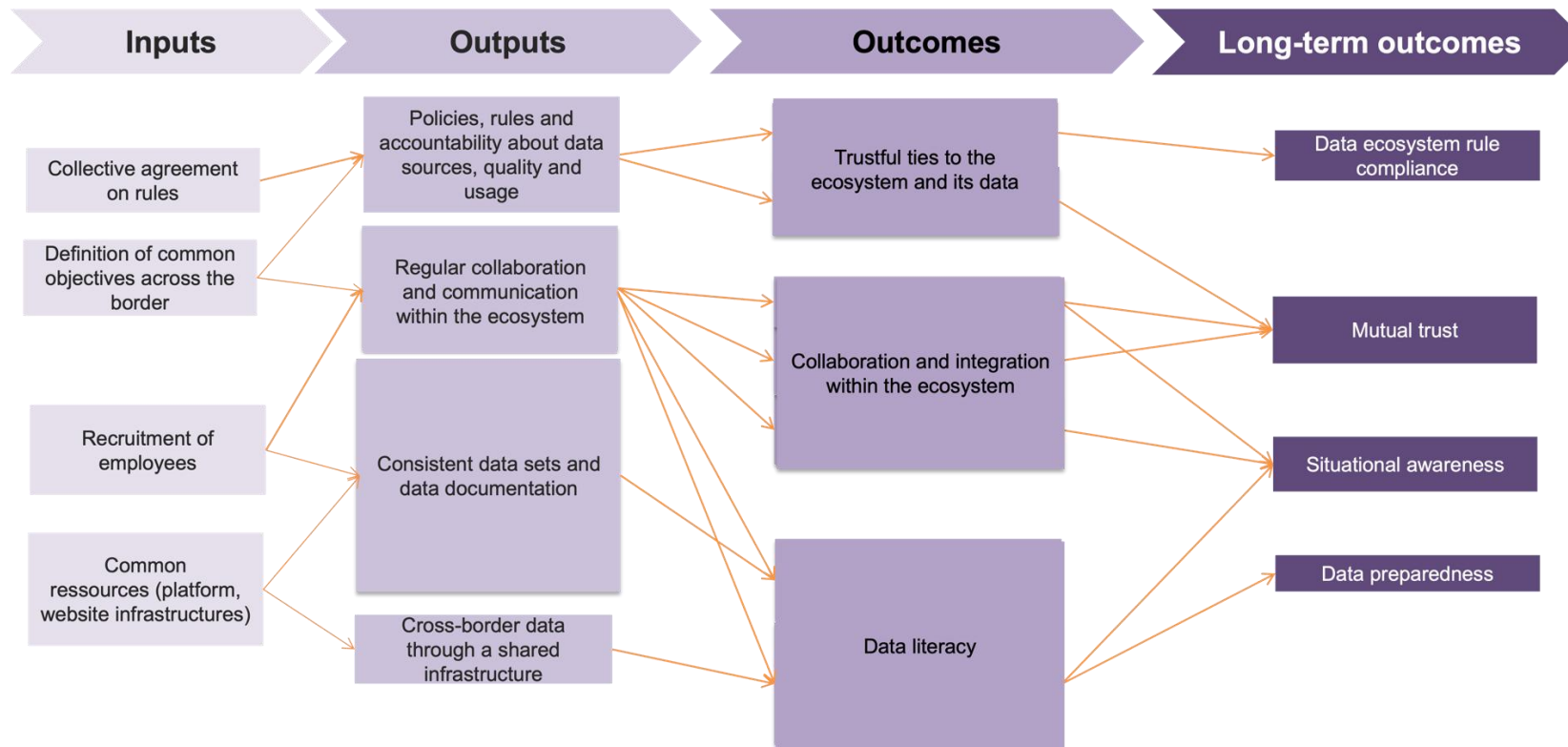


Figure 2. Impact of the data ecosystem on its members resilience

DISCUSSION

Limitations

This work in progress presents some limitations. Primarily it still requires further data analysis and coding, which will help refine the model. In particular, the causality links between the inputs, outputs, short term outcomes and long-term outcomes require further comparison with the empirical data. Also, in a longer temporal horizon, the model should be tested through statistical data and analysis. Two strategies could be adopted. First, one could focus on a specific cross-border data ecosystem and collect longitudinal data. Second, one could compare multiple cases of cross-border data ecosystems at various level of development. Also, further analysis should take into consideration how cross-border data ecosystems negatively impact resilience.

Despite our efforts to refine the model, the research design does not take into consideration the technical features of the data ecosystem, which is due to the absence of such a data ecosystem. The DRR actors have not yet reached a consensus on the data sets they will share in the ecosystem, but they are already aware of the type of data that could be shared and the technical issues related to data, such as access, integrity and maintenance. This oversight has the potential to introduce bias in the model by overlooking critical technical aspects. On the other hand, technical issues related to data have been predominantly documented, on the contrary to the socio-technical side of data usage for disaster management (Petrenj et al., 2013).

Finally, it should be noted that our reliance on ToC implies an idealistic view on data ecosystems. The long-term outcomes depend on the existence of the short-term outcomes, which in turn depend on the outputs, and the outputs depend on the inputs. However, it should be emphasized that the proposed model does not imply that input, outputs, short-term and long-term outcomes always occur. Rather, the model outlines how its various components favor each other. From this perspective, inputs and outputs should be viewed as drivers for outcomes.

Practical expectations

This research is part of a larger project that aims at providing a tool to baseline the impact of a data ecosystem on its members. In practice, this means that the model will be translated into a form that will be regularly completed by ecosystem members. This form will help track the effective impact of the data ecosystem on its members over time. Over time, consistent and comprehensive data collection enables the evaluation and comparison of long-term outcomes among members.

Theoretical contribution

By relying on Theory of Change, this research presents a prospective and comprehensive model of the impact of a data ecosystem on its members' resilience. This approach is helpful in that it considers time not only as a limiting factor, but also as a revealer of various impacts. It reveals that the effect of data ecosystems on resilience is not monochromatic and static but, rather, multidimensional and dynamic.

The model also enhances the socio-technical dimension of data ecosystems. This dimension was enhanced in previous research (Petrenj et al., 2013). However, a technical understanding of data sharing and data ecosystems remains predominant in the literature. The proposed model highlights how the technological and social resources intricately interact to shape collaboration and data usage within a data ecosystem.

Our contribution also lies in our examining a cross-border region. Cross-border regions are well known as fragmented territories (Kratke, 1999), in which collaboration can be particularly difficult and fragile. Taking these settings into consideration allows us to reveal some factors of sustainability that operate but might remain underestimated in less fragmented settings.

CONCLUSION

This paper is a prospective study of the conditions under which a cross-border data ecosystem can support resilience at borders. It aims at explaining the necessary conditions for, in the short term, better data sharing, and, in the long term, resilience at borders. Despite the recent momentum of data ecosystems, our understanding of their impacts remains limited. The presented work addresses this lack. It explores the case of the Italian French cross border and relies on qualitative data collected through observation, interviews and focus groups with experts, practitioners and academics. Drawing on the ToC, the study proposes a model – still in progress – that outlines the short term and long-term benefits from a data ecosystem running in a satisfactory way. The model, once refined, is expected to enrich our knowledge and, in the long term, support the establishment of sustainable data

ecosystems for disaster management.

ACKNOWLEDGMENTS

This research has been financially supported by the European Commission (EC) and is part of the ECHO Red Roses project (101101221). We also thank Lucas Eustache and the following master students who participated into the research project: Alice Boeffard-Dossier, Selma Benboubker, Letizia Caielli, Lila Caldas, Anna Haberkorn, Hawa Kane, Alice Serra, Salome Ritouret.

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