



Social capital and community action

Have they contributed to the resilience of vulnerable territories in Paraguay during the COVID-19 pandemic?

An analysis of the Social Capital, Economic Vulnerability and Collective Action Survey

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Contents

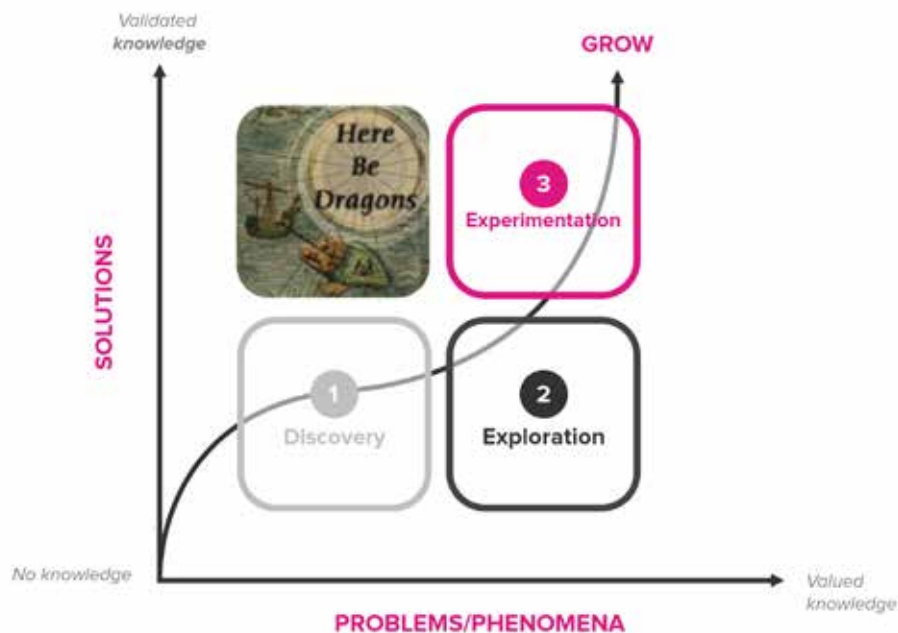
Preface: Innovation and Learning for Sustainable Development	7
Summary	9
Introduction	10
Conceptualizing Social Capital,	11
Collective Action and Vulnerability	11
Social Capital	11
Collective action	12
Vulnerability	13
Hypothesis	14
Summary of the discovery stage	16
Hot spots: prototype of a map of social capital vs. need in Paraguay	17
Survey Design	19
Unit of analysis and population	19
Sample distribution	20
Survey structure	21
Limitations of the study	22
About the indices	22
About the models	22
Other limitations or aspects to consider	22
Construction of Variables	23
Descriptive analysis	25
Econometric models and analysis of results	28
Determinants of the articulation of civic demands	28
What is the effect of social capital and trust on the articulation of civic demands?	29
Determinants of the articulation	30
of self-help resources	30
What is the effect of social capital and trust on the articulation of resources for self-help?	31
Determinants of public institutional response	32
Who receives an institutional	
response to their demands?	33
How does collective action affect household economic vulnerability?	34
Determinants of vulnerability reduction	34
Determinants of access to collective assets	36
What is the effect of social capital and trust on access to collective assets?	36
Determinants of participation	37
in collective asset management.	37
What is the role of social capital and trust in community participation associated with collective	
assets?	38
Conclusions and Implications for Public Policy	40
Bibliography	42

Preface: Innovation and Learning for Sustainable Development

The mission of the United Nations Development Programme (UNDP) Accelerator Lab in Paraguay (AccLabPY) is to generate and apply knowledge that accelerates our understanding of what works—and what does not—in the pursuit of sustainable development. To achieve

this mission, AccLabPY launches learning loops that methodologically guide our activities towards the discovery, exploration and experimental testing of innovative interventions and public policies for sustainable development (Figure 1).

Figure 1: Accelerator Labs Learning Loop.



Source: AccLabPY

The four phases of this process allow for the development and testing of interventions based on local evidence. In these phases we:

(1) **discover** challenges and innovations based on local experience in order to generate contextualized understandings of the problems and phenomena related to sustainable development issues we seek to intervene in;

(2) **explore** opportunities identified in the discovery phase with reference to lessons shared by our global network of laboratories or other relevant sources, and in alliance with strategic actors, ultimately generating in potential solutions;

(3) **experiment** and test proposed solutions in local context in order to generate evidence about what works, how and in which scenarios, and build portfolios of interventions that address complex challenges from multiple fronts, and finally;

(4) **grow**, by transferring knowledge generated to the appropriate actors, so that they can influence, based on the evidence, the final design and implementation of the solutions, taking into account their limitations and potentialities. The effective application of this knowledge represents the culminating moment in which the learning of a cycle or multiple related cycles becomes innovation to accelerate sustainable development.

In Paraguay, as in many other countries, the COVID-19 pandemic has been marked by the emergence of countless mutual aid initiatives. To better understand the articulation of these collective initiatives, and their impact on people's economic vulnerability, the AcCLabPY launched a learning loop on social capital, resilience and social protection during the COVID-19 pandemic that asks the following questions:

- (1) **Discovery:** What is the structure of social capital (bonding, bridging, and linking relations) in Paraguay and how mapping this structure helps us identify gaps between the demand for aid and available social capital?
- (2) **Exploration:** What is the relationship between 1) social capital networks, 2) norms of trust and reciprocity, 3) different forms of collective action, and 4) vulnerability in rural and urban Paraguay during the COVID-19 pandemic?

- (3) **Experimentation:** What interventions can we design, prototype and evaluate to increase social capital and reduce vulnerability, based on the analysis and results of the first two stages of the cycle?

This report focuses on the results obtained in the exploration phase and describes the process of constructing and analyzing the results of the Social Capital, Economic Vulnerability and Collective Action Survey administered between December 2020 and January 2021, and also includes a brief review of the results of the discovery phase. In this way, it seeks to identify experimental interventions and additional complementary activities that can generate meaningful and actionable evidence on the impact of social capital and its usefulness in the design of public policies for resilience and social cohesion.

Summary

Our learning loop pursues two objectives: (1) to measure the social capital of vulnerable households in terms of interpersonal networks and norms of trust, and (2) to analyze its impact on collective action and vulnerability during the first year of the pandemic. As a result of the first phase, we developed a hypothesis about the potential relationships between economic vulnerability, social capital and collective action, which was based on the learnings, concepts and empirical studies on social capital that resulted from that process.

In this report, we present the theoretical framework underpinning our hypothesis, review the key learnings from the first stage to contextualize the exploration phase, and describe the survey design that was the centerpiece of that phase. We then propose econometric models to analyze the aforementioned relationships, with a focus on vulnerable households in Paraguay during the pandemic. Finally, we discuss the implications of this evidence for the identification, design and evaluation of policies that promote social cohesion and resilience.

Data to measure and analyze these relationships were collected through an original survey on “Social capital, economic vulnerability and collective action,” which was administered between December 2020 and January 2021 to a representative sample of the vulnerable Paraguayan population, composed of 1,200 households in three sampling strata: (A) Asunción and its metropolitan area, (B) other urban agglomerations and medium-sized districts, and (C) small districts and rural areas.

A key finding is that collective action for the articulation of self-help resources (e.g., ollas populares) contributed to the decrease in economic vulnerability during the first year of the pandemic. In addition, we found that

this type of collective action is influenced by the presence of linking social capital, that is, with the relation that individuals have with people in power. On the other hand, one of the most important findings of this work relates to the role of collective assets in reducing economic vulnerability. Access to and participation in the management of collective assets, such as community water and sanitation systems, community public spaces, and other collective assets, reduced economic vulnerability during the pandemic. It is also important to mention that both access to and management of such collective assets are positively related to the presence of linking social capital. This suggests that linking social capital was one of the main determinants of the articulation of collective action during the COVID-19 pandemic in Paraguay.

How can we increase access and facilitate participation in the management of public spaces and other collective assets? How can we strengthen the networks of mutual aid and social capital that were activated during the pandemic to reduce vulnerability? How do these questions relate to territorial development dynamics? The results point the way towards the design of programmatic interventions that answer these questions as a nodal strategy for a sustainable development portfolio that increases the resilience of our communities.

Introduction

Solidarity has been the hallmark of the COVID-19 pandemic. Faced with the socioeconomic challenges of a pandemic that, in its first wave, reduced the income of more than 60% of Paraguayan households and left at least one third without food on at least one occasion (Ballon, Lara-Ibarra, Olivieri, & Rivadeneira, 2020), numerous and diverse initiatives emerged from all sectors, coalescing into collective action repertoires that responded to the needs of “food security, self-care (and mutual aid), sanitation and economic relief” (Duque Franco, Ortiz, Samper, & Millan, 2020).

For many vulnerable communities these initiatives became a way to survive the crisis by articulating community networks of mutual aid and channeling support from civil society organizations and government programs, such as cash transfers. However, the prevalence of these initiatives varied across the national territory and may not have reached all vulnerable communities.

Perhaps the most emblematic of these collective action initiatives in Paraguay were the “ollas populares”, a phenomenon that is not new in Latin America (Hardy, 1986), but which has gained unusual strength in the pandemic, representing the most frequent expression of collective action through the articulation of self-

help resources. These community managed soup kitchens, as well as similar initiatives such as community kitchens or solidarity raffles, are organized by neighbors and social organizations to respond to the needs of individuals and families who lost their source of income in the course of the pandemic and lockdown (Colmán & Yampéy, 2020). Out of these local initiatives, organizational networks emerged to channel coordinated collective action into civic demands, for example efforts to advocate for and mobilize citizens in favor of the approval and implementation of the law on soup kitchens, enacted in September 2020 in Paraguay.¹ Collective action also took the form of common digital spaces²³ to connect requests with sources of mutual aid, as well as other citizen initiatives to create or manage collective assets such as the installation of hygiene points or community vegetable gardens.

What was the effect of social capital in promoting these dynamics of collaboration and collective action during the pandemic? How did collective action affect access to state support for households? And how did collective action affect, directly or indirectly, household economic vulnerability during the pandemic? In this report, we present, analyze, and discuss the answers provided by our social capital learning cycle to these questions.

¹ Law 6603/2020, “De apoyo y asistencia a las Ollas populares organizadas en todo el territorio de la República del Paraguay durante la pandemia declarada por la Organización Mundial de la Salud a causa del COVID-19”. <http://silpy.congreso.gov.py/expediente/121632>

² AyudaPY (ayudapy.org), Mapa Social (elmapasocial.org), and Wendá (wenda.org.py) are digital platforms that emerged during the pandemic.

³ A map of ollas populares and other initiatives was created and maintained by the National Innovation Strategy and the AccLabPY, through Wendá: <https://mapa.wenda.org.py/>

Conceptualizing Social Capital, Collective Action and Vulnerability

Social Capital

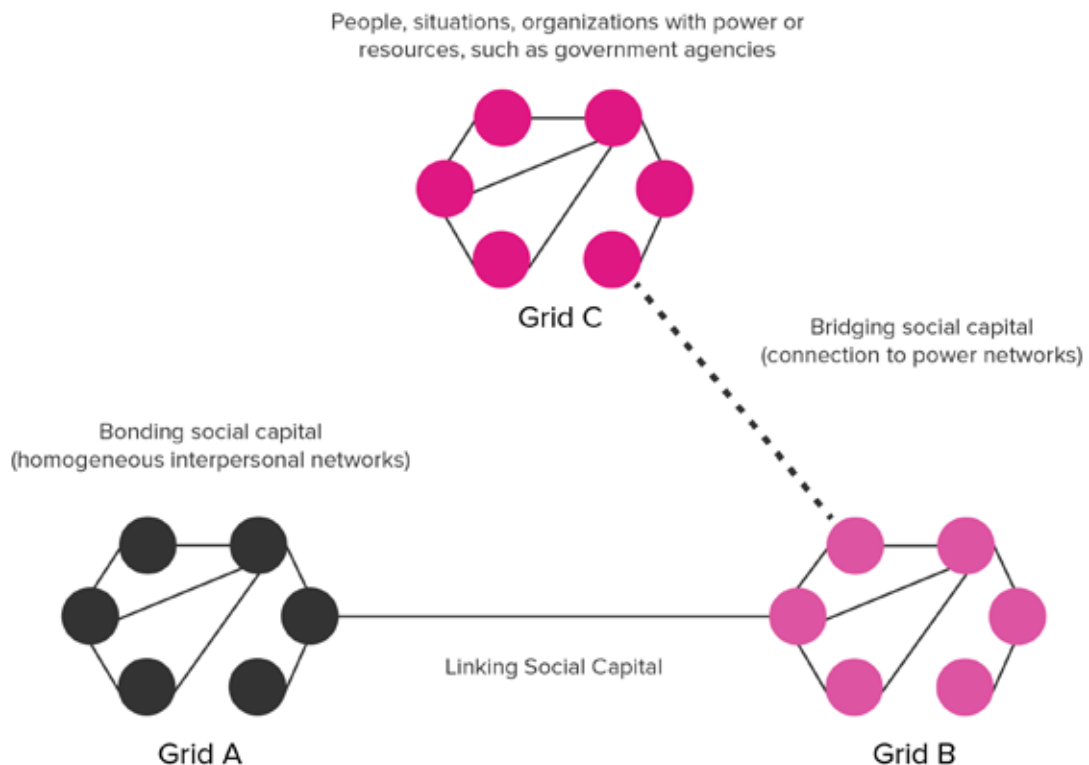
The concept of social capital addresses the importance of group life and sociability for cooperation, trust and social cohesion. It is defined in terms of the structure of the interpersonal networks of individuals in a territory and the norms of reciprocity and trust that exist among the inhabitants of the same territory (Helliwell & Putnam, 2004; Katz & Rotter, 1969; Oxendine, Borgida, Sullivan, & Jackson, 2003; Rotter, 1967).

Social capital has been widely studied and understood as a facilitator of coordination and cooperation for mutual benefit (Putnam, 2000), generating all kinds of positive externalities (Coffé & Geys, 2007) and, in particular, as an articulator for disaster preparedness, response,

and recovery (Hurlbert, Haines, & Beggs, 2000; Metaxa-Kakavouli, Maas, & Aldrich, 2018; Shoji, Takafuji, & Harada, 2020; Smiley, Howell, & Elliott, 2018). This growing body of evidence points us to the fact that a community’s resilience to crises, such as the COVID-19 pandemic, can be enhanced through the social ties that are generated through different types of networks (Aldrich, 2012; Reiningger et al., 2013).

To better understand the role of social ties, it is useful to distinguish three types of ties that people may have, as conceptualized by the literature on social capital and defined in terms of the structure of interpersonal networks (**Figure 2**).

Figure 2: Types of social capital according to the structure of interpersonal networks.



Source: Adapted from Figure 1 of (Adams, 2020).

1. Bonding Social Capital (Horizontal): describes connections between members of the same community, such as friends or relatives, resulting in close ties with a particular group (Adler & Kwon, 2002), and characterized by high levels of similarity between the people in the group. Often, they also share attitudes, information and available resources (Mouw, 2006). This strong connection can provide access to social support and personal assistance, especially in times of need.

2. Bridging Social Capital (Horizontal): describes connections between dissimilar or heterogeneous groups (Paxton, 2002). These connections may be with known people (friends of friends) who are reached through social groups with different characteristics in terms of class, race, or some other identity aspect. These ties tend to have more diversity and provide novel information and resources that can help people to advance in society, for example, by providing greater employment opportunities than bonding ties, even when they represent weak ties (Granovetter, 1973).

3. Linking Social Capital (Vertical): describes connections between ordinary citizens and individuals in positions of institutional power, which can occur through formal and informal means. This type of network embodies norms of respect and relationships of trust between people interacting across explicit, formal or institutionalized gradients of power or authority in society (Szreter & Woolcock, 2004).

In addition to this definition, which focuses on the structure of interpersonal networks, social capital is also defined in terms of trust as “the internalization at the individual level of norms

Collective action

Cooperation and collective action are fundamental elements of social cohesion (UNDP, 2020), and during the pandemic they have been a defining feature of responses to various challenges posed by the public health emergency (Hattke & Martin, 2020; Meinzen-Dick, 2020; Tittonell et al., 2021). In this sense, analyzing the collaborative capacity of the different groups that make up society is key to understanding processes of economic, political and social development.

We define collective action in simple terms as

of reciprocity, which facilitates collective action by allowing people to take risks and trust that fellow citizens will not take advantage of them.” (Oxendine et al., 2003). Trust conditions the ability of a group of people to solve problems together (Elinor Ostrom, 1998). However, different types of trust have been eroded by the pandemic (Bosancianu et al., 2020; Fell, 2021), from trust in others, or interpersonal trust (Rotter, 1967), to that in government and other societal institutions, or institutional trust (Cummings & Bromiley, 2012). This direct relationship with pandemic makes trust a key element of this theoretical framework.

From other perspectives, social capital is also defined in terms of the role of social relationships in achieving personal or collective interests (Siisiäinen, 2000). This conceptualization comes mainly from the work on different forms of capital by Bourdieu (Bourdieu, 1980), who also introduces concepts of civic demand that can emerge when mobilizing the relationships that define the social capital of individuals or groups (Bourdieu, 2000). Finally, although theory and empirical studies emphasize the positive effects, there is also literature that emphasizes their limitations or negative effects (Coleman, 1988; DeFilippis, 2001). We can argue that this more critical view is associated with the fact that, frequently, research on social capital tends to treat social relationships only as instrumental, and loses sight of the fact that many of the most trusted connections are precisely those that are not instrumental. Therefore, considering concepts of deeper trust in studies on social capital may be a way to better capture such a phenomenon (Parra, Nemer, Hakken, & D’Andrea, 2015).

collaboration or cooperation between members of a community to carry out joint activities for mutual benefit. We observe collective action when a group of individuals act in a unitary manner for some reason or in pursuit of an end (Manrique Hernández & Martínez Saldarriaga, 2019; Melucci & Treviño, 1989).

The causes or foundations of collective action are studied and theorized by different fields of the social sciences that variously locate these foundations in: the interests of individuals in response to material incentives; the institutional

rules that structure individual and group incentives (Olson, 1971; E. Ostrom, 1990); and the social norms that govern behavior beyond individual material rationality (Elster, 2010), including the cognitive and interpretative schemes that govern the collective rationalities of non-institutionalized social movements (Tilly, 1985). In this framework, social capital, as a structure of interpersonal relationships and as social norms of trust and reciprocity, is understood as a set of informal institutions that produce capacity for collective action for mutual benefit.

Efforts to respond to the COVID-19 pandemic generated all kinds of collective action dilemmas, in which meeting the need for food or medical aid has come from (1) initiatives in which people have participated voluntarily, (2) with outcomes that have been enjoyed by people beyond those directly involved in organizing or managing them, (3) ultimately creating public goods whose provision has depended on the successful cooperation of a large number of actors (Rompf, Kroeber, & Schlösser, 2017), coordinating their activities and working together (Nakagawa & Shaw, 2004). In this context, norms of reciprocity and trust, combined with the scope and nature of interpersonal networks, can enhance collective action for a community.

Vulnerability

The concept of vulnerability is widely studied in the literature, but rarely precisely defined, which makes it difficult to apply and measure (Delor & Hubert, 2000). In general, it “refers to the possibility of harm, finitude and the mortal condition of being human” (Feito, 2017) or to “exposure to contingencies and stress, combined with the difficulty of coping with them” (Chambers, 1983; Delor & Hubert, 2000). It is a phenomenon that has to do with conditions associated with each person, affecting them individually, and that can be seen as an essential characteristic of people in the sense that their existence is not “taken for granted” but depends on many factors, so that “we receive basic protections in the form of universal rights” (Kottow, 2003). Thus, as Feito (2017) argues, vulnerability has “a dimension of susceptibility to harm, conditioned by intrinsic and extrinsic factors, anchored in the radical fragility of the human being, but undoubtedly attributable in good measure to social and environmental elements.”

Franco et al. (2020), for example, analyzed collective action in seven different spheres (housing, income generation, food security, infrastructure, public health, human security and political participation) in Latin America during the pandemic, concluding that collective action was “diverse in its forms and resources, but limited in its scope”, which coupled with what they define as discordance with government action, points to “crucial spaces of informality, vital for cultivating the foundations of a healthy recovery, that are being neglected”.

Based on this theoretical framework and our observations through collective action mapping (Gustale Gill & Fernández de Castro, 2020), this paper focuses on three types of collective action that summarize the diversity of forms mentioned above: (1) collective action that mobilizes a community’s own resources to generate mutual aid (e.g., ollas populares), (2) collective action that mobilizes people to articulate civic demands (e.g., citizen mobilizations that led to the approval of a Ley de Ollas Populares), and (3) collective action associated with access to and management of collective assets (e.g., participation in neighborhood commissions or in the asset management of a producers’ committee).

The concept of vulnerability is often defined in relation to the susceptibility of people to fall into poverty or extreme poverty. The vulnerable are those who, despite not being officially below the poverty line, “are at relatively high risk of falling back” into poverty (Serafini, 2014). Economic vulnerability, then, is associated with levels of poverty, a concept that has evolved and is currently better understood from a perspective that defines it as a multidimensional phenomenon, which goes beyond having income below a certain threshold and also includes other types of deprivations that people face (UNDP & OPHI, 2019). From Kottow’s (2003) perspective, we can understand such deprivations as elements that increase people’s susceptibility to economic, social and political contingencies, resulting in their exclusion or “progressive distancing from a situation of social integration” (Laparra & Pérez, 2008) or in the “deterioration of aspects of people’s lives and of the spaces and contexts where they live” (Monti, 2017).

In the literature on social capital, vulnerability has been the focus of numerous empirical studies and theoretical analyses that treat it as a dependent variable, generally defined as susceptibility to a specific risk such as flooding (Malherbe, Sauer, & Aswani, 2020; Pelling, 1998) or gender-based exclusion from social capital networks itself (Thieme & Siegmann, 2010).

Hypothesis

How are social capital, collective action and household vulnerability related?

Our prior learnings, alongside the concepts and empirical studies in the literature, allowed us to develop a hypothesis about the potential relationships between economic vulnerability, social capital and collective action. Figure 3 plots this general hypothesis through three arrow diagrams that propose a causal relationship between these variables or social phenomena.

1. Bonding social capital (interpersonal networks between socially homogeneous individuals) generates capacity for collective action, given the presence of trust in that network.

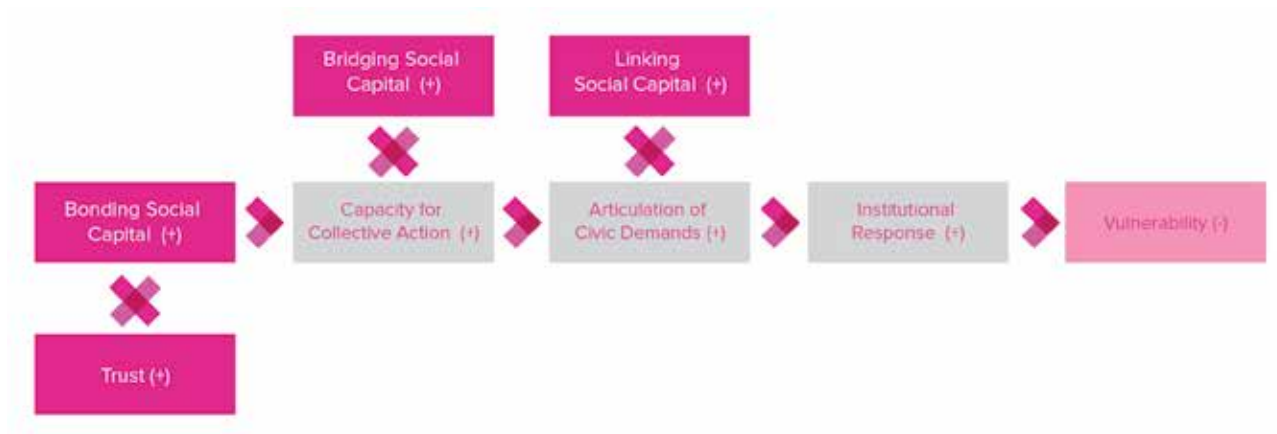
This broader conceptualization of vulnerability is our starting point, and in this paper, we use indicators of social exclusion as defined by Monti (2017) that measure the economic dimension of vulnerability, as a strategy to narrow our scope in the face of the complexity we encounter when exploring the concept.

2. The capacity for collective action, in the presence of bridging social capital (between socially heterogeneous individuals), can directly produce the articulation of community resources for self-help, an articulation of civic demands, or access to collective assets.

3. The articulation of civic demands, in the presence of linking social capital (interpersonal relationships with people in positions of institutional authority) produces a public institutional response.

4. Finally, public institutional response, self-help and access to collective assets reduce household vulnerability.

Figure 3: Three causal chains that represent our hypotheses and guide the survey design and analysis.



(a) The causal chain of vulnerability reduction through collective actions that articulate civic demands



b) The causal chain of vulnerability reduction through collective action linked to collective assets



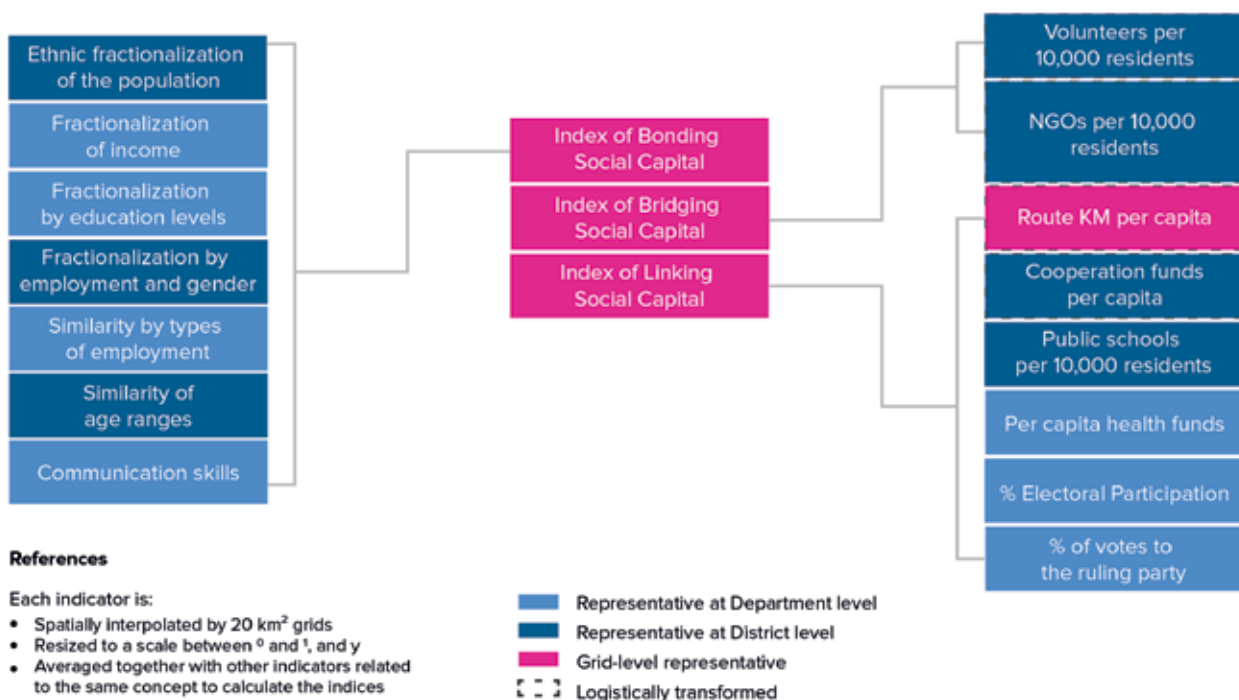
c) The causal chain of vulnerability reduction through collective action for the articulation of self-help resources.

Summary of the discovery stage

In Paraguay, we do not have much data on social capital at the district, departmental or national level, and there has not yet been much exploration of this concept. Therefore, we adopted a discovery strategy that consisted of using an approach previously used in Paraguay (Centro de Análisis y Difusión de la Economía Paraguaya, 2015; Rodríguez, 2017), where we constructed social capital indices from existing data in national databases infer levels of social capital. For example, using the Permanent Household Survey (INE, 2021) we use indicators of education or age as an approximation of bonding social capital, as these variables can reflect levels of homogeneity and similarity across territories. Thus, we constructed proofs-of-concept for the three social capital indices described in the pre-

vious section, using (1) demographic and employment variables to represent homogeneous or bonding networks, (2) variables relating to the number of civil society organizations and initiatives to represent heterogeneous or bridging networks, and (3) variables related to levels of public investment and political-electoral processes to represent vertical or linking networks with political power. Although the data sources presented different levels of geographic disaggregation, the indices were constructed in a standardized manner at the level of 20 km² grids. Each grid has a score from 0 to 1 for each index, indicating the abundance of social capital or the magnitude of demand for assistance in that area.

Figure 4: Indicators used for each social capital index in the proof of concept.



Source: AccLabPY

Additionally, we constructed indices to estimate **vulnerability** and **demand for aid** following the same procedure, with demographic and housing variables from the Permanent Household Survey to represent vulnerability, and the num-

ber of requests on AyudaPY, a free digital platform developed during the pandemic to publish and respond to requests for help, to calculate an indicator of demand for help.

Figure 5: Indicators used for vulnerability and demand for assistance indices



Source: AccLabPY

Hot spots: prototype of a map of social capital vs. need in Paraguay

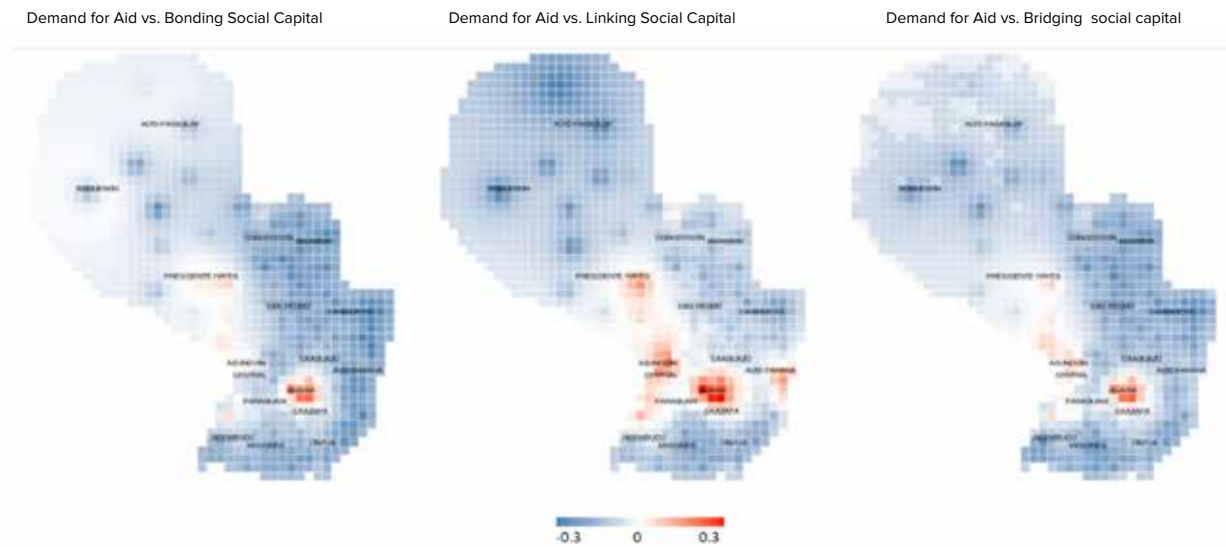
By comparing the values of these indices, we constructed a heat map, thus identifying **hot spots** where the gap between the level of social capital and the demand for aid is greater, and **cold spots**, where the gap is smaller. The largest gaps between these variables are visible in the departments of Guairá, Asunción and Metropolitan Area, and Presidente Hayes, where there is a higher level of demand for aid with respect to the social capital built in those territories. Estimating these gaps served as a **proof of concept** of the methodology for identifying territories that might need support to respond to all aid demands (see **Figure 6** and **Figure 7**).

However, this approach has its limitations. When the population is sparse, it fails to properly cap-

ture the size of the gaps. In addition, the level of disaggregation of many of the secondary data sources does not allow for a sufficiently localized analysis to guide public intervention. Finally, it is difficult to accurately distinguish the multiple cause-and-effect relationships between different indicators and indices.

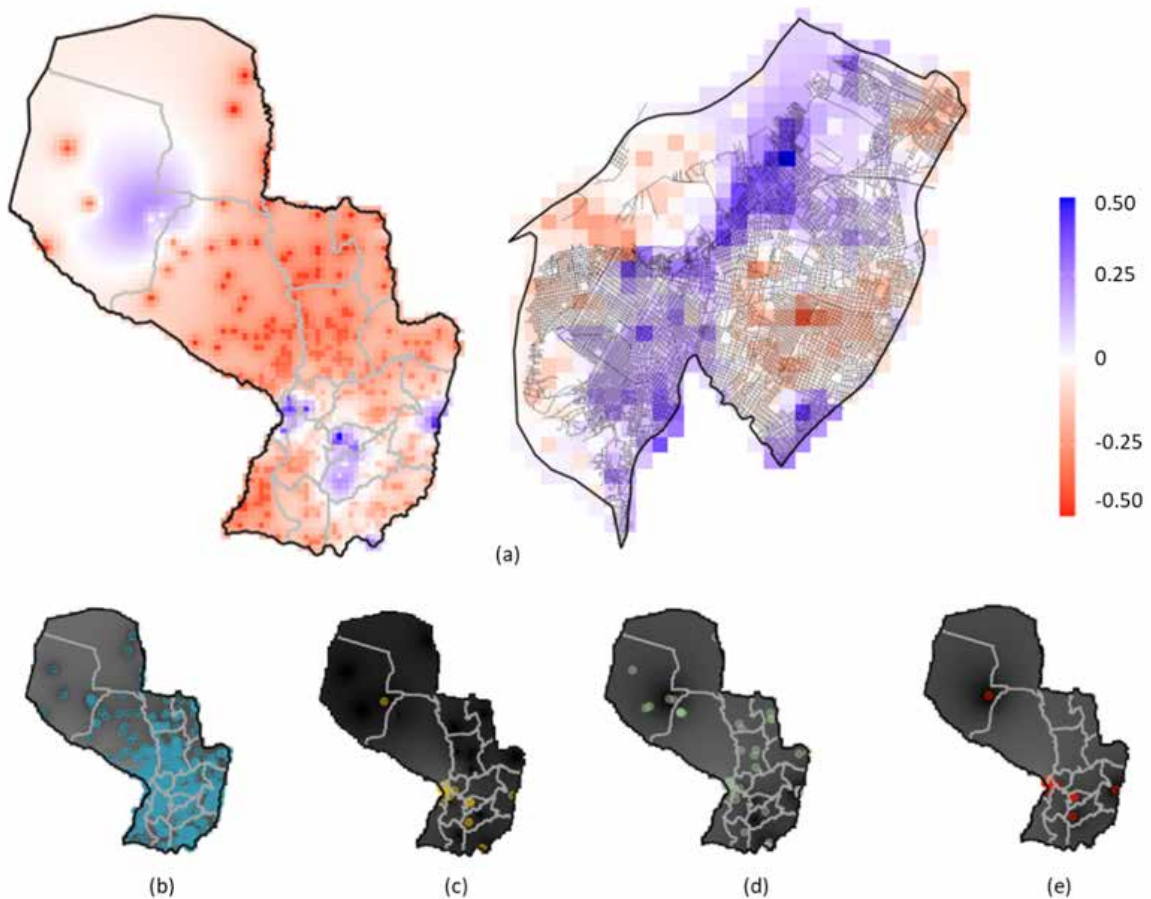
Fed more precise information or complemented with algorithms that improve estimates from primary measurement data on social capital, these maps can be useful for guiding institutional and civil response in the short, medium and long term. For this reason, and based on these lessons learned, the next phase of this cycle focused on **designing and conducting the survey on social capital, economic vulnerability and collective action**, representative for the entire country, whose results are the focus of this report.

Figure 6: Heat map indicating the hot and cold spots in relation to the gap between the demand for aid and the social capital available in the same territory.



Source: EPH, AyudaPY and Wenda data.

Figure 7: Other maps visualizing (a) gaps between demand for aid and social capital at the country level and in Asunción, (b) requests for aid, (c) solidarity organizations, (d) volunteer organizations, and (e) other citizen initiatives.



Source: EPH, AyudaPY and Wenda data.

Survey Design

Unit of analysis and population

The data for the analysis of the social capital - vulnerability relationship come from the Survey of Social Capital, Economic Vulnerability and Collective Action, administered between December 2020 and January 2021 to a sample made up of 1,200 households representative of the eastern region and three population strata: 1) the metropolitan area of Asunción (AMA), 2) large non-metropolitan urban agglomerates (Ciudad del Este, Encarnación and Pedro Juan Caballero and their agglomerates), 3) medium-sized districts (Tavaí of the Department of Caazapá and Concepción of the Department of Concepción) and small districts (Tacuaras of the Department of Ñeembucú, Juan de Mena of the Department of Cordillera and Yryvu cuá, of the Department of San Pedro).

The sample takes as the unit of analysis the population in households residing in neighborhoods and localities of the Eastern Region with the highest incidence of poverty. In accordance with the analytical requirements of the study (independent estimates for the domains Metropolitan Area of Asunción -AMA-; Urban areas of the Eastern Region and Rural areas of the Eastern Region), it was decided to create three main sample strata, of 400 cases each (fixed allocation); completing a total sample size of 1,200 cases. The sampling design was defined as quasi-probabilistic stratified multistage, with mixed allocation. The sampling units used in the

design were: Districts (Primary Sampling Units); urban neighborhoods and rural localities (Secondary Sampling Units); urban blocks (tertiary sampling units -only in urban neighborhoods-); and persons (Quaternary and final Sampling Units).

Under the proposed design, the sample allows the calculation of estimates of the variables considered in the study, representing the situation and opinions of the population in households residing in neighborhoods and localities of the Eastern Region with the highest incidence of poverty in general; and particular estimates of the reference population residing in the Metropolitan Area of Asunción; urban areas of the Eastern Region and rural areas of the Eastern Region. For the estimates on the total reference population, a theoretical sampling error of $\pm 2.83\%$ is assumed (for a confidence level of 95% and $P=Q$).

The sample has the potential for the development of high-precision estimates for the population to which the study was oriented; as well as standard precision level estimates in each of the sample strata mentioned, and aggregates of the same (for example, total urban areas). It should be noted that the development of estimates for particular sub-universes should be evaluated in each case in terms of the level of precision.⁴

⁴ It is recommendable to avoid estimates whose coefficient of variation exceeds the threshold of ^{0.20}, or - failing that - ^{0.25} for experimental approaches.

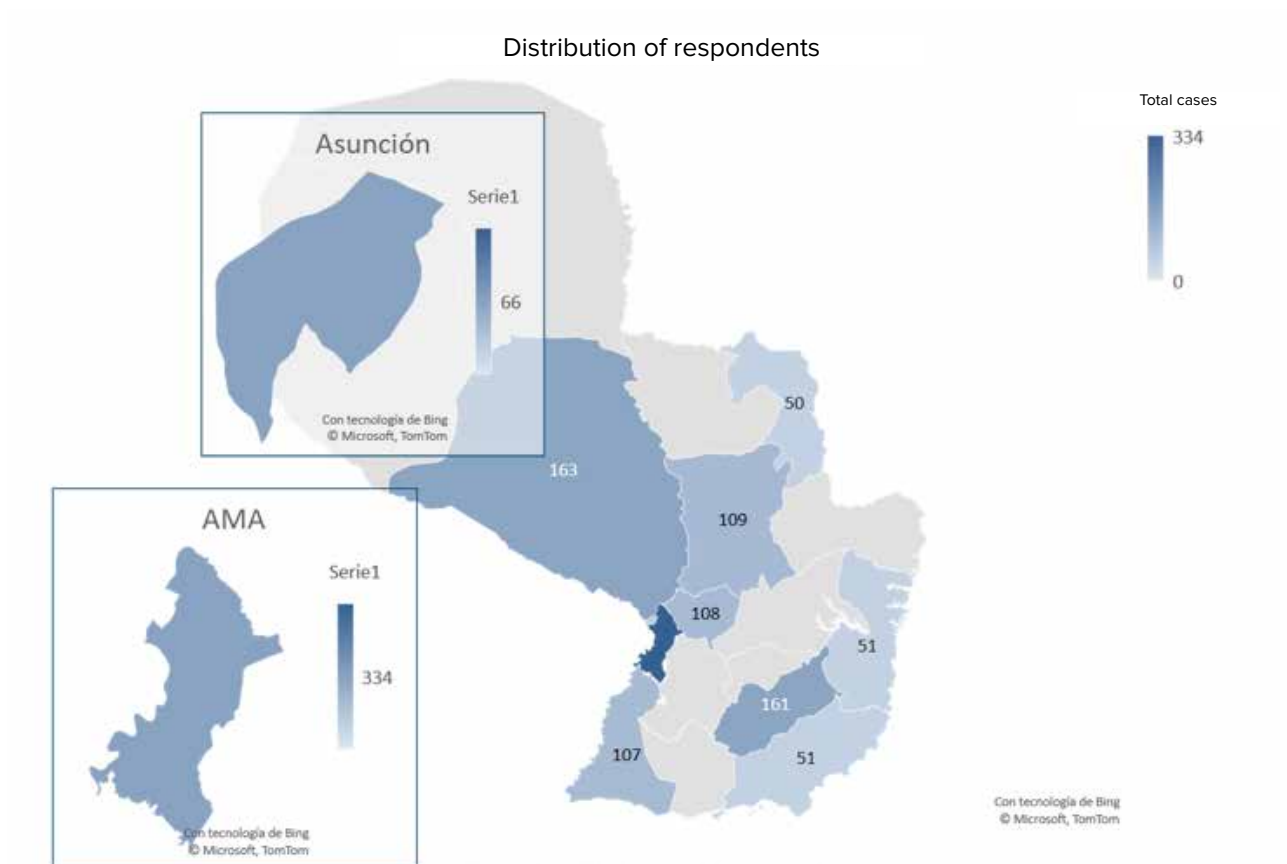
Sample distribution

Table 1. Distribution of the sample according to strata, substrata, districts and area (number of households)

Strata	Substrata	District	Zone		Total
			urban	rural	
Asuncion Metropolitan Area	Asunción	Asunción	66	0	66
	Central	Itá, Limpio, Luque, Nueva Italia, San Antonio	293	41	334
Resto of the Eastern Region	Large agglomerations	Gran Ciudad del Este, Gran Encarnación, Pedro Juan Caballero	134	18	152
	Medium-sized districts	Tavaí (Caazapá), Concepción (Concepción)	133	191	324
	Small districts	Tacuaras (Ñeembucú), Juan de Mena (Cordillera), Yryvu Cuá (San Pedro)	133	191	324
Total			759	441	1.200

Source: AcclabPY

Figure 8: Map of geographic distribution of the sample.

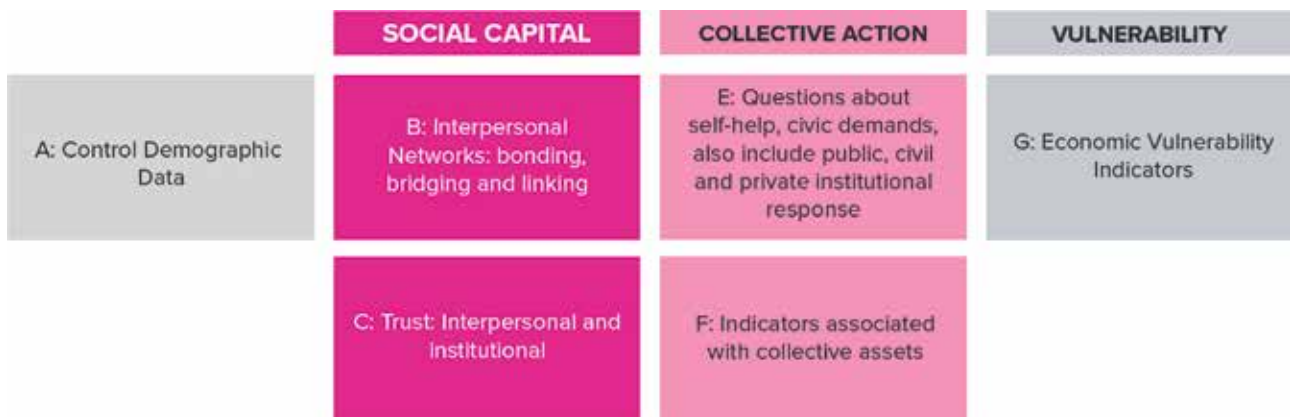


Survey structure

Data on social capital, trust, collective action and household vulnerability were collected using a questionnaire with six sections, designed to as-

sess the hypotheses listed above, and organized according to the three main concepts addressed in our theoretical framework (Figure 9).

Figure 9: Survey sections



Source: AcclabPY

1. Section A: collects sociodemographic characteristics and indicators of economic vulnerability. It includes questions on gender, age, level of education, and current and pre-pandemic employment status.

2. Section B: collects information on the structure of interpersonal networks. It incorporates questions based on individuals' social ties (Aldrich & Meyer, 2015), following the typology of ties defined in the theoretical framework (see Figure 2). For each type of bond, we capture two different levels to address some of the limitations we mentioned in the theoretical framework: those connections that may represent occasional or superficial trust, and those connections that represent bonds more stable or deep trust.

3. Section C: collects indicators on norms of reciprocity and trust, which is part of our theoretical framework of social capital. They combine aspects of interpersonal trust (Katz & Rotter, 1969) with others of institutional trust (Vidotto, Vicentini, Argentero, & Bromiley, 2008).

4. Section D: collects indicators of economic vulnerability, with questions that capture deprivation of goods or services related to housing, water and garbage, based on indicators defined by Monti (2017).

5. Section E: collects indicators of participation, collective action articulation and institutional response. It collects data for the characterization of a particular type of collective response, such as, for example, the ollas populares. It includes special questions on the organization of the initiatives and their organizers, their characteristics, the resources they have, and the support connections they receive from civil society organizations or the government. In addition, questions related to government support (public response), support from civil organizations (civil response) and support from businesses (private response) received by individuals during the pandemic are included.

6. Section F: collects indicators on collective assets. It incorporates questions on access to these assets, as well as participation in their management by the individuals surveyed.

The questionnaire was administered to persons 18 years of age and older from the households selected in the sample. All sections and questions of the questionnaire are available in Annex 1: Survey Instrument.

Limitations of the study

It is important to keep in mind the following limitations of our current study when considering our variables and models.

About the indices

To understand the reach of social capital, vulnerability and collective action, we calculate scores for each question associated with these variables, which are then combined to generate indices. In addition, each score is calculated by making decisions about the extent to which different components of a variable affect its magnitude, as explained in detail in Annex 2: Index Construction, where we also document the consistency of each index.

For example, when we talk about interpersonal networks, we have questions that capture casual connections and others that capture more trusted connections, and our indices give more weight to the latter. Other ways of combining the different scores or disaggregating the scores could be explored, seeking to significantly improve the consistency of the indexes, especially those where we have not yet achieved high consistency.

Additionally, the current version of the indices is not standardized so that they all have the same range (e.g., 0 to 1). This makes some aspects of the models difficult. For example, it is not feasible for all indexes to generate graphs that help us to better visualize the outcome of the models.

About the models

Our models and analyses focus on the indexes, and in that sense, a limitation of the study is that it leaves pending a more disaggregated analysis, which directly explores the relationships with important aspects of each variable.

For example, when we calculate institutional trust, we use an inventory of trust questions that capture trust in various institutions of the state and society in general. This could accommodate an analysis that considers only certain types of institutions.

Other limitations or aspects to consider

There are survey data that have not yet been appropriately considered in our analysis. We have the geographic coordinates of each respondent, which enables the possibility of expanding the analysis by incorporating some variables from their territorial context, which would allow us to broaden and improve our definition of vulnerability, which is currently limited to economic dimensions and does not yet capture other more complex aspects of people's social or environmental vulnerability.

We also have open questions for which we conducted an initial coding, but which could be refined to better understand, for example, the diversity of collective action.

Construction of Variables

We measured the main variables (vulnerability, social capital, and collective action) with indices constructed from responses to individual questions from survey participants.

Figure 10 shows how the social capital index is calculated for a fictitious case, in order to visualize an example that allows understanding the general calculation mechanics we used for all the indexes, detailed in Annex 2: Construction of Indexes, which describing the procedure and approach adopted for each of these indexes.

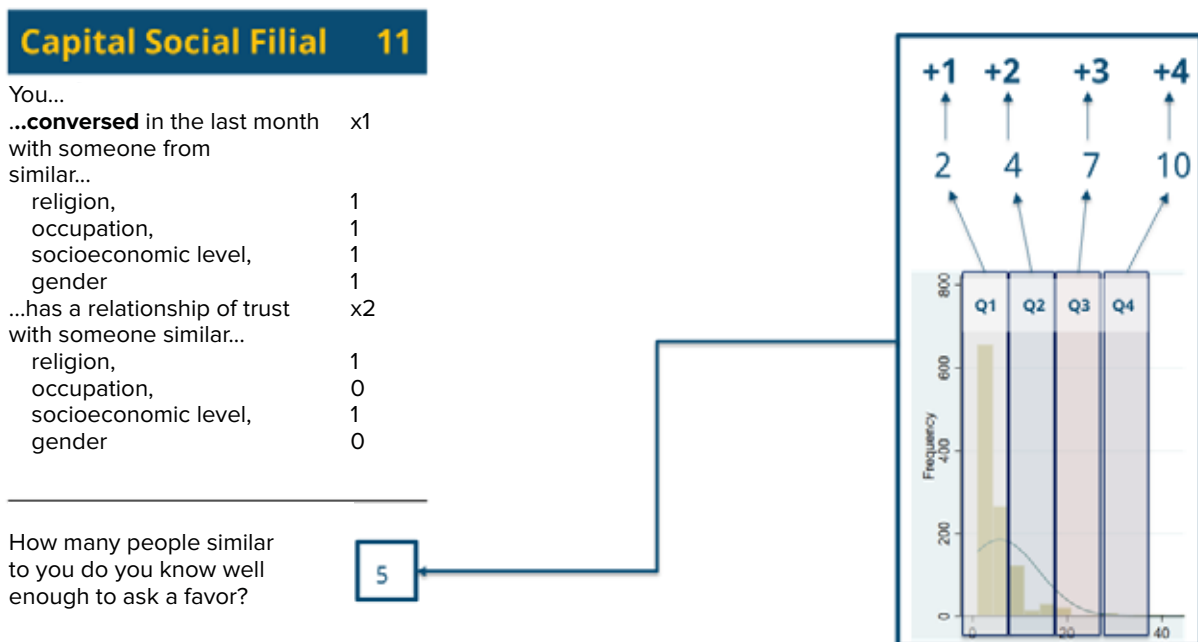
Table 2 shows all the indexes constructed with their respective definitions, as well as a summary of the theoretical values that they can take. These variables are used to perform the preliminary exploratory analysis. In this sense, first, the statistics of the most relevant variables within the analysis are described. Then, the main descriptive statistics of these variables are presented.

Table 2: Variables considered in the preliminary exploratory analysis

Index	Definition	Theoretical Value	
Bonding social capital	Defined as the score that results from combining the answers on interactions maintained during the last month, and the extent of interpersonal networks in terms of number of people, with people similar to oneself, in terms of religion, religious movement, gender, ethnicity, socioeconomic level, occupation and educational level.	0	30
Bridging social capital	Defined as the score that results from combining the answers on interactions maintained during the last month, and the extent of interpersonal networks in terms of number of people, with people different from oneself , in terms of religion, religious movement, gender, ethnicity, socioeconomic level, occupation and educational level.	0	36
Linking social capital ()	Defined as the score that results from combining the answers on membership in a political party, the influence of this party in the territory and the interactions maintained with leaders of the party itself and of other parties during the last 6 months.	0	51
Interpersonal trust ()	Defined as the score resulting from combining questions on trust in different institutions.	3	15
Institutional Trust ()	Defined as the score that results from combining questions about trust in other people in the community.	9	45
Articulation of self-help resources ()	Defined as the score that results from combining answers to questions about actions taken by the community, in a self-organized manner, to address needs or problems that arose during the pandemic (e.g., a soup kitchen).	0	3
Participation in collective resource management ()	Defined as the score resulting from combining answers to the questions on participation in the use or management of collective assets available in the community (e.g., participation in the coordination of a producers' committee).	0	18

Index	Definition	Theoretical Value	
Articulation of civic demands ()	Se define como el puntaje que resulta de combinar respuestas a las preguntas sobre acciones que tomó la comunidad para movilizar demandas cívicas al estado (por ejemplo, participar de manifestaciones o protestas ciudadanas)	0	3
Access to collective resources	Defined as the score resulting from combining answers to questions about actions taken by the community to mobilize civic demands to the state (e.g., participating in demonstrations or citizen protests).	0	19
Public institutional response ()	Defined as the score that results from combining responses that capture the assistance received by respondents from the public sector.	0	10
Civil society response ()	Defined as the score that results from combining responses that capture the assistance received by respondents from the civil society	0	1
Private sector response ()	Defined as the score resulting from combining responses that capture the assistance received by respondents from the private sector.	0	1
Economic vulnerability ()	Defined as the score that results from combining elements of economic vulnerability and includes the following indicators: housing situation, access to constant and quality water, household waste disposal situation, and occupancy status.	0	16.21

Figure 10: Example of calculation of the Bonding Social Capital index for an individual respondent



Source: AcclabPY

Descriptive analysis

By looking at the average value of the variables for the study population, we can describe presence of the different types of social capital and trust, collective action and vulnerability and how these vary between rural and urban areas. In general, we find higher levels of vulnerability, institutional trust, linking social capital and access to collective assets in rural areas compared to urban areas.

It is important to mention that in addition studying the differences between rural and urban areas, we also separately analyzed data from urban areas belonging to Asunción and the Metropolitan Area (AMA) and urban areas outside the AMA with the objective of including in the analysis all the strata considered in the survey. However, no significant differences were found between individuals from urban areas that belong to AMA and those that do not, so these results are not reported in this report.

In the survey date, we observe that the surveyed population is composed of 47.9% men and 52.1% women, aged 18 or older. On average, they are 42 years old and more than half of the respondents (60.3%) reported having 6 years or less of education.

Figure 11 plots the results of the main indices calculated for the analysis. First, a low average degree of vulnerability can be observed in relation to the range of our index, which sums up all the possible conditions that make a person vulnerable, according to the indicators used. In other words, compared to the maximum level of vulnerability possible, i.e., 16.21 points according to the calculated index, we observe 4.61 on average. However, we can note that rural areas present higher levels of vulnerability compared to urban areas ($t=-14.94$; $p\text{-value}=0.000$).

To give an example, as part of the vulnerability index, we asked how household waste is managed. Only 24% of the surveyed population has a formal collection service, either public or private. It is important to note that when we analyze rural areas, access to a collection system reaches only 1% of the surveyed population in these areas.

With regard to the social capital indices (**Figure 11b**), we found that linking social capital is significantly stronger in rural areas than in ur-

ban areas ($t=-1.99$; $p\text{-value}=0.046$), which implies that individuals in rural areas tend to have higher levels of connection with individuals in positions of institutional authority, compared to what is registered in urban areas. Analyzing the questions that are part of this index, we can find that 74.6% of the population surveyed in rural areas is a member or is affiliated with a political party or movement, while 68.75% of respondents in urban areas report an affiliation.

In the case of bonding social capital (ties with individuals who share the same identity) and bridging social capital (ties with those who do not share the identity) no significant differences were found between urban and rural areas. The average social capital index we found is 28.63 (out of a maximum of 30 points). Bridging social capital reaches 18.96 out of a maximum of 36 points. When we look at the scores that make up each index, we find, for example, that the average number of bonding connections, that is, how many similar people are part of each person's network is 6.06, and in the case of bridging connections, how many different people are part of the network, it is 4.67, which is consistent with the higher levels of bonding social capital that we observe in the results.

The trust indices (**Figure 11c**) show a low level of trust both in relation to other members of the community, as well as towards formal institutions (government, civil organizations, political parties, private companies, the church and the police). Institutional trust is significantly higher in rural areas compared to urban areas ($t=-2.60$, $p\text{-value}=0.009$). Therefore, individuals living in rural areas tend to trust their institutions more. However, in the case of interpersonal trust, no significant differences were found between urban and rural areas.

Figure 11d suggests that in general, the capacity for collective action during the pandemic has been low. The average is well below the maximum score that each index can produce. However, this result is difficult to interpret without frames of reference (national, regional or international). The results by zone show that participation in collective asset management is higher in rural areas ($t=-7.79$, $p\text{-value}=0.000$), which is also associated with the significantly higher access of rural areas to collective assets ($t=-5.03$, $p\text{-value}=0.000$), reported in Figure 10e.

To give an example of collective assets in urban and rural areas, the survey collected that 80.2% of the urban population surveyed has a place to play sports in the community, relative to 82.99% in rural areas. The use of these spaces is also higher in rural areas, with 36.2% reporting use versus 32.17% use in urban areas.

On the other hand, the articulation of resources for self-help and civic demands is significantly higher in urban areas (both at 5% significance level). For example, this is evident in the question on the participation of individuals in community help actions: 22.45% of urban areas reported participating in such actions, while only 16.31% of respondents in rural areas did so. Likewise, 7.38% of respondents in urban areas organized or were part of the organizing team of a demonstration or citizen mobilization, compared to 4.22% in rural areas. Finally, although there is a great diversity of actions reported to the open-ended question on examples of these collective actions, an initial categorization analysis shows that about 53.49% of these initia-

tives were to address food problems (14.58% classified as collection or donation of food, and 38.91% as soup kitchens). The remaining initiatives include direct donations of money to neighbors in the community, installation of hand-washing stations, delivery of informative pamphlets, neighborhood collections of money for volunteer firefighters, among others.

Finally, we observe a low level of public institutional response, which does not vary much by zone, although it slightly favors rural zones (significant at 1%). In contrast, both private and civilian response was significantly stronger at 1% in urban areas.

A more detailed version with implications for public policy of this first descriptive analysis, including an initial look at possible relationships between variables through a correlation matrix can be found in the UNDP Development Futures publication series (Montanía, Parra, Setrini, & Ríos, 2021).

Figure 11: Indices of vulnerability, social capital, trust, collective action, access to collective assets and institutional response (sample averages).



Source: AcclabPY

Econometric models and analysis of results

What is the effect of social capital and trust on collective action and household economic vulnerability?

To answer this question, it is necessary to analyze how these variables vary jointly. For this reason, a series of regression models are proposed to test the hypotheses of each link of the causal chains in **Figure 3**. Together, the models seek to identify whether the presence of trust and social capital in a community determines the articulation of collective action and whether these actions decrease economic vulnerability. The estimation of the models was carried out with Ordinary Least Squares (OLS).

This section describes and discusses the main findings obtained from the estimations. It is important to mention that in addition to the results presented, we also performed estimations that included a variable to differentiate between urban areas belonging to Asunción and the Met-

ropolitan Area (AMA) and urban areas outside the AMA. However, we did not find significant differences between individuals from urban areas belonging to AMA and those not belonging to AMA, so we do not report those results in this report.

On the other hand, when estimating the relationship between social capital, trust and the other variables, we split the components of these concepts and applied them in separate models: the filial, bridging and linking social capital indices on the one hand, and trust on the other. This responds to the fact that our theoretical framework and preliminary results (Montanía et al., 2021) point to a close relationship between these elements, so that their endogenous variation makes them behave as the same variable, which in turn may cause the loss of accurate information about the specific impact of each of them on vulnerability.

Determinants of the articulation of civic demands

According to the hypothesis presented, the formation of social capital contributes to the articulation of collective actions for civic demands.

From there, and the inclusion of other variables that are considered relevant for the articulation of such demands, we propose the expression (1):

$$\begin{aligned} \ln ac_dem_i = & \beta_0 \\ & + \beta_1 \ln cs_f_i + \beta_2 \ln cs_c_i + \beta_3 \ln cs_v_i + \beta_4 educ_i + \beta_5 sit_ocup_i + \beta_6 rural_i \\ & + \beta_7 mujeres_i + \beta_8 edad_i + \varepsilon_i \quad (1) \end{aligned}$$

Where:

- $\ln ac_dem_i$ es el logaritmo natural⁵ del índice de articulación de demandas cívicas del individuo i .
- $\ln cs_f_i$ es el logaritmo natural del índice de capital social filial del individuo i .
- $\ln cs_c_i$ es el logaritmo natural del índice de capital social conectivo del individuo i .
- $\ln cs_v_i$ es el logaritmo natural del índice de capital social vinculante del individuo i .
- $educ_i$ es el nivel de educación del individuo i .
- sit_ocup_i es la situación de empleo en la que se encuentra el individuo i .
- $rural_i$ es una variable dummy que toma el valor 1 si el individuo i pertenece a zonas rurales y 0 si pertenece a zonas urbanas.
- $mujeres_i$ es una variable dummy que toma el valor 1 si el individuo i es del género femenino y 0 si es de género masculino.
- $edad_i$ es la edad del individuo i .

⁵ The logarithms of each type of index are calculated to explain the estimated effects resulting from the regression analysis in terms of percentage changes.

In addition, to explore the role of the different types of trust that individuals can develop in the articulation of civic demands, we propose the following model:

$$\ln ac_dem_i = \beta_0 + \beta_1 \ln conf_inter_i + \beta_2 \ln conf_inst_i + \beta_3 educ_i + \beta_4 sit_ocup_i + \beta_5 rural_i + \beta_6 mujeres_i + \beta_7 edad_i + \varepsilon_i \quad (2)$$

where all variables have been previously defined and:

- $\ln conf_inter_i$ es el logaritmo natural del índice de confianza interpersonal del individuo i .
- $\ln conf_inst_i$ es el logaritmo natural del índice de confianza institucional del individuo i .

What is the effect of social capital and trust on the articulation of civic demands?

Table 3 shows the estimation results of these first two models. First, the results of Model 1 show that the articulation of civic demands is not conditional on the index of bonding or bridging social capital, but are positively related to the index of linking social capital, suggesting that individuals organize to realize their demands when they have greater connections with people in power. For every 1% increase in the index, the index of civic demands increases by about 5.4%. This model also suggests that civic demands decrease as educational level increases and when individuals belong to rural areas.

Model 2, which seeks to estimate the impact of trust on the articulation of civic demands, indicates that a positive variation of 1% in the institutional trust index corresponds to a negative variation of approximately 16% in the index of articulation of civic demands. This decrease is also generated by an unfavorable occupational situation and by belonging to rural areas.

In summary, the results show that civic demands are stronger when there are links with those in power but decrease as institutional trust increases. This could mean that the mobilization of the community to make these demands occurs when there is a greater probability of having a response due to the connection with people with political power, such as leaders of community party organizations (e.g., section presidents or political committees). It could also mean that it is these leaders who mobilize the community to make such demands. At the same time, they indicate that people do not mobilize when they trust institutions, potentially because such trust is transferred to a perception that there is no need for mobilization for the response of these institutions to arrive. On the other hand, the effect of occupational status and rurality may be related to the fact that the less time available due to work or occupational issues, or the greater the distance from a locality with an institutional presence, the lower the capacity to mobilize to make demands.

Table 3: Determinants of articulation of civic demands

	ln ac_dem _i	
	Modelo 1	Modelo 2
ln cs_f _i	-0.073 (0.072)	-
ln cs_c _i	-0.006 (0.013)	-
ln cs_v _i	0.054*** (0.011)	
ln conf_inter _i	-	0.014 (0.038)
ln conf_inst _i	-	-0.159** (0.075)
educ _i	-0.014* (0.008)	-0.005 (0.008)
sit_ocup _i	-0.007 (0.005)	-0.010* (0.005)
rural _i	-0.060*** (0.019)	-0.041** (0.018)
women _i	-0.030 (0.019)	-0.026 (0.020)
age _i	-0.001 (0.001)	0.000 (0.001)
Const.	0.391 (0.270)	0.641** (0.249)
Obs.	1,200	1,200
R²	0.043	0.016
Reference Values		
<i>Robust standard errors in parentheses</i>		
*** p<0.01	** p<0.05	* p<0.1

Determinants of the articulation of self-help resources

The hypothesis presented indicates that the formation of social capital (bonding, bridging and linking), conditions the articulation of a territory's own resources for self-help. Therefore, we present the expression (3) to measure these relationships:

$$\ln ac_auto_i = \beta_0 + \beta_1 \ln cs_f_i + \beta_2 \ln cs_c_i + \beta_3 \ln cs_v_i + \beta_4 educ_i + \beta_5 sit_ocup_i + \beta_6 rural_i + \beta_7 mujeres_i + \beta_8 edad_i + \varepsilon_i \quad (3)$$

Where in addition to the previously defined variables:

- $\ln ac_auto_i$ is the natural logarithm of individual i 's self-help resource articulation index. i .

Also, we seek to test the role of trust in the articulation of community actions:

$$\ln ac_auto_i = \beta_0 + \beta_1 \ln conf_inter_i + \beta_2 \ln conf_inst_i + \beta_3 educ_i + \beta_4 sit_ocup_i + \beta_5 rural_i + \beta_6 mujeres_i + \beta_7 edad_i + \varepsilon_i \quad (4)$$

Where all variables were previously defined.

What is the effect of social capital and trust on the articulation of resources for self-help?

Table 4 reports the results obtained in the estimation of expressions (3) and (4). The results of Model 3 show that **the self-help resource articulation index** does not have a statistically significant relationship with either **the bonding or the bridging social capital index**, but is positively influenced by the **linking social capital index**. Specifically, it is found that, on average, an individual with 1% more ties with people in positions of institutional authority has a 15% greater capacity to **articulate community actions in 15%**. With respect to trust, we observe that **the institutional trust index is negatively related to the self-help index**.

In other words, people who trust institutions more tend to organize themselves to a lesser extent to articulate community self-help actions, such as the organization and management of a soup kitchen or a solidarity fundraising event (see Model 4). This may be due to the fact that trust in institutions generates confidence in the possibility of receiving a response from institutions, and therefore there is no need to articulate a local solidarity action.

At the same time, it is interesting to note that linking social capital has a positive and significant effect on the articulation of self-help. One way to understand this result could be that the connection with people of greater political power allows the articulation of self-help resources to also receive some external resources that fa-

cilitate their organization and management.

The absence of significant relationships with bridging social capital, both in these models and in the previous one, is remarkable. Organized civil society, and the volunteerism it traditionally mobilizes, are sources of potentially bridging ties for vulnerable communities, as has been documented in the literature. According to our theoretical framework, bridging ties have not been very active in organizing collective action during the pandemic. The reason why the index of bridging social capital does not appear in our results as a significant determinant of the articulation of resources for self-help is something that requires future exploration, but could be related to the low scope that these articulations have had according to Duque et. al. (2020).

Along the same lines, unfavorable occupational situations also contribute significantly to the decrease in self-help, which could be related to the lower capacity of these individuals to participate and contribute to these efforts. On the contrary, higher levels of education and older age have a positive and significant influence on the articulation of community actions for self-help, which may indicate that this articulation may respond to factors associated with management skills and available time of people living in a given community.

Table 4: Determinants of the articulation of self-help resources

	ln ac_auto_i	
	Modelo 3	Modelo 4
ln cs_f_i	-0.120	-
	(0.107)	-
ln cs_c_i	0.028	-
	(0.019)	-
ln cs_v_i	0.156***	-
	(0.015)	-
ln conf_{inter}_i	-	0.018
	-	(0.069)
ln conf_{inst}_i	-	-0.239**
	-	(0.119)
educ_i	0.024**	0.051***
	(0.012)	(0.013)
sit_{ocup}_i	-0.012	-0.025**
	(0.009)	(0.010)
rural_i	-0.069**	-0.015
	(0.031)	(0.033)
women_i	0.002	0.004
	(0.033)	(0.035)
age_i	0.001	0.004***
	(0.001)	(0.001)
Const.	0.397	0.871**
	(0.398)	(0.412)
Obs.	1,200	1,200
R²	0.126	0.032
Reference Values		
<i>Robust standard errors in parentheses</i>		
*** p<0.01	** p<0.05	* p<0.1

Determinants of public institutional response

Next, we seek to analyze the generators of public institutional response. To this end, we start from the hypothesis that the articulation of civic demands of people in vulnerable situations, together with linking social capital, generate public institutional response. Expression (3) captures this hypothesis in a model:

$$\ln R_{pub}_i = \beta_0 + \beta_1 \ln vuln_i + \beta_2 \ln ac_{dem}_i + \beta_3 \ln cs_v_i + \beta_4 educ_i + \beta_5 rural_i + \beta_6 mujeres_i + \beta_7 edad_i + \varepsilon_i \quad (5)$$

Where in addition to the previously defined variables:

- $\ln vuln_i$ es el logaritmo natural del índice de vulnerabilidad del individuo i .
- $\ln R_{pub}$ es el logaritmo natural del índice de respuesta institucional pública correspondiente al individuo i .

Who receives an institutional response to their demands?

According to the hypothesis posed, when civic demands are combined with linking social capital, public institutional responses increase. However, **Table 5** reveals that **institutional response during the COVID-19 pandemic was positively and significantly influenced by individuals' vulnerability** and not so by demands for help or ties to people in power. This result is an indicator that institutional policies of targeting state aid in vulnerable territories were mainly guided by the levels of vulnerability of those

territories during the first year of the pandemic. In addition, it can be observed that belonging to rural areas, being a woman and of advanced age, increases the public institutional response. This suggests, once again, that the assistance provided by public institutions is more focused on meeting the needs of certain vulnerable sectors of the population than on civic demands or the connection of individuals with people in power.

Table 5: Determinants of the public institutional response

ln R _{pubi}		
	Modelo 5	
ln vuln _i	0.014*** (0.004)	
ln ac_dem _i	-0.006 (0.080)	
ln cs_v _i	0.003 (0.003)	
educ _i	-0.008*** (0.002)	
rural _i	0.027*** (0.007)	
women _i	0.024*** (0.005)	
age _i	0.001*** (0.000)	
Const.	1.068*** (0.013)	
Obs.	1,200	
R²	0.144	
Reference Values		
<i>Robust standard errors in parentheses</i>		
*** p<0.01	** p<0.05	* p<0.1

Determinants of vulnerability reduction

Following the line of causality proposed in **Figure 3**, the articulation of resources for self-help in a territory decreases vulnerability. Expression (6) captures this relationship, together with other variables that can condition vulnerability:

$$\ln vuln_i = \beta_0 + \beta_1 \ln ac_auto_i + \beta_2 educ_i + \beta_3 sit_ocup_i + \beta_4 rural_i + \beta_5 mujeres_i + \beta_6 edad_i + \varepsilon_i \quad (6)$$

Where all the variables have been previously defined.

In addition, expression (6) studies the relationship between vulnerability and access to collective assets, in addition to other variables of interest:

$$\ln vuln_i = \beta_0 + \beta_1 \ln commons_i + \beta_2 educ_i + \beta_3 sit_ocup_i + \beta_4 rural_i + \beta_5 mujeres_i + \beta_6 edad_i + \varepsilon_i \quad (7)$$

Where in addition to the previously defined variables, $\ln commons_i$ represents the natural logarithm of the index of access to collective assets.

Also, we seek to analyze the relationship between vulnerability and participation in collective asset management:

$$\ln vuln_i = \beta_0 + \beta_1 \ln part_commons_i + \beta_2 educ_i + \beta_3 sit_ocup_i + \beta_4 rural_i + \beta_5 mujeres_i + \beta_6 edad_i + \varepsilon_i \quad (8)$$

Where in addition to the previously defined variables, represents the natural logarithm of the index of participation in collective asset management. i

How does collective action affect household economic vulnerability?

Table 6 collects the results of the estimations to identify the drivers of the decrease in vulnerability. As suggested by the hypothesis, the results of Model 6 show a significant and negative relationship between the **articulation of self-help resources and individual vulnerability**. A positive difference of 1% in the participation of individuals in collective self-help actions such as soup kitchens and the collection of food for donation corresponds to an 8% lower value in their vulnerability index. This result is one of the most striking findings of this study: **local initiative and solidarity played a key role in addressing the various needs that arose during the pandemic and that directly impacted the vulnerability levels of Paraguayan communities**. A detailed analysis of some of the questions related to this variable shows that 47.1% of the aid initiatives were led by neighborhood groups or grassroots organizations such as neighborhood committees. The role of the

church in this type of initiative was also important, as 17.28% of respondents reported that the leadership of the initiatives was provided by the church, parish, chapel or local priest. The remainder are divided into a diversity of actors that include sports clubs, cooperatives, committees or organized groups of people who are not necessarily neighbors, and an important number of political leaders, mayors, school principals, and other people who have, in some way, some linking power. These results are complemented by the positive and significant role of linking social capital in the articulation of self-help indicated in Table 4, since they show that a significant number of initiatives were articulated by people with political power or influence who participated in their organization and management.

On the other hand, Model 7 yields the second most striking result of this work: a **1% increase in access to collective assets than the average**

is associated with a 15% lower value in an individual's vulnerability index.

Access to and participation in the management of collective assets, such as community water and sanitation systems, community public spaces, among others, reduced economic vulnerability during the pandemic. Model 8 shows that not only does access to collective assets reduce vulnerability, but that **participation in their management** is also an important factor. In other words, when people access and participate in the management of community water and sanitation systems, community public spaces, producers' committees, neighborhood commissions, among others, they decrease their eco-

nomical vulnerability in a pandemic context. This result indicates a potential avenue for programmatic intervention **through direct investment in building and strengthening these types of common community resources.**

Finally, the three models presented yield similar results for the other variables, i.e., they suggest that **education level contributes to decreased vulnerability, while belonging to rural areas and being female increase it.** These results are intuitive and also guide us towards possible programmatic actions that focus on rural collective assets, with greater participation of women.

Table 6: Determinants of vulnerability

	ln vuln _i		
	Modelo 6	Modelo 7	Modelo 8
ln ac_auto _i	-0.087*** (0.031)	-	-
ln commons _i	-	-0.157*** (0.035)	-
ln part_commons _i	-	-	-0.112*** (0.023)
educ _i	-0.083*** (0.014)	-0.086*** (0.014)	-0.085*** (0.014)
rural _i	0.477*** (0.031)	0.503*** (0.032)	0.514*** (0.033)
women _i	0.308*** (0.033)	0.288*** (0.033)	0.306*** (0.033)
age _i	-0.001 (0.001)	-0.002* (0.001)	-0.001 (0.001)
Const.	1.475*** (0.081)	1.654*** (0.086)	1.485*** (0.081)
Obs.	1,200	1,200	1,200
R ²	0.250	0.258	0.254
Reference Values			
<i>Robust standard errors in parentheses</i>			
*** p<0.01	** p<0.05	* p<0.1	

Considering that our estimates revealed that collective assets play a key role in reducing vulnerability, we propose to explore the factors

that encourage or discourage access to these assets and the community participation they generate.

Determinants of access to collective assets

To answer this question, we propose models (9) and (10), which explore the role of social capital, trust and other variables of interest in access to collective assets.

$$\begin{aligned} \ln \text{commons}_i = & \beta_0 \\ & + \beta_1 \ln \text{cs}_f_i + \beta_2 \ln \text{cs}_c_i + \beta_3 \ln \text{cs}_v_i + \beta_4 \text{educ}_i + \beta_5 \text{sit_ocup}_i \\ & + \beta_6 \text{rural}_i + \beta_7 \text{mujeres}_i + \beta_8 \text{edad}_i + \varepsilon_i \quad (9) \end{aligned}$$

$$\begin{aligned} \ln \text{commons}_i = & \beta_0 \\ & + \beta_1 \ln \text{conf_inter}_i + \beta_2 \ln \text{conf_inst}_i + \beta_3 \text{educ}_i + \beta_4 \text{sit_ocup}_i \\ & + \beta_5 \text{rural}_i + \beta_6 \text{mujeres}_i + \beta_7 \text{edad}_i + \varepsilon_i \quad (10) \end{aligned}$$

Where all variables have been previously defined.

What is the effect of social capital and trust on access to collective assets?

The estimation results of models (9) and (10) can be found in Table 7. Model 10 shows that **linking social capital positively influences access to collective assets, while the presence of bonding social capital decreases this access**. Thus, power ties generate greater access to collective assets. This could be due to the fact that people with influence and political power have the capacity to mobilize resources that are then invested in these types of assets, while in the absence of these types of ties, it becomes difficult for vulnerable communities to mobilize these types of connections or resources.

In addition, the increase in networks with people of the same type, bonding social capital, contributes to the decrease in individuals' access to collective assets. This is supported by the results of Model 10, which shows that there is a negative relationship between interpersonal trust and access to collective assets. In other words, **where there is more trust between individuals and interpersonal networks are formed between them, there is less access to**

collective assets. This is an unexpected result, but one that could be related to the argument that the most trusting relationships, which are probably those associated with bonding ties, are not necessarily instrumental in the sense of resulting in coordinated collective action, such as articulating self-help or generating access to collective assets. On the contrary, it could be that these links are activated in a more personal way, that is, they mobilize mutual aid directly between individuals, without necessarily constituting a collective group action, a variable not contemplated in our survey. In this sense, the activation of more personal aid circuits could condition the amount of time and resources available to devote to generating access to collective assets.

Finally, both models indicate that belonging to rural areas is positively correlated with access, while being a woman and of advanced age decreases it, again pointing the way for public policies that focus on strengthening access and participation of rural areas and women.

Table 7: Determinants of Access to Collective Assets

	ln common _i	
	Modelo 9	Modelo 10
ln cs_f _i	-0.092 (0.010)	- -
ln cs_c _i	-0.008 (0.018)	- -
ln cs_v _i	0.084*** (0.014)	- -
ln conf_inter _i	- -	-0.139** (0.061)
ln conf_inst _i	- -	-0.004 (0.105)
educ _i	-0.001 (0.011)	0.010 (0.011)
sit_ocup _i	-0.006 (0.009)	-0.012 (0.009)
rural _i	0.132*** (0.028)	0.157*** (0.029)
women _i	-0.130*** (0.031)	-0.129*** (0.031)
age _i	-0.004*** (0.001)	-0.002** (0.001)
Const.	1.501*** (0.371)	1.505*** (0.354)
Obs.	1,200	1,200
R²	0.088	0.060
Reference Values		
<i>Robust standard errors in parentheses</i>		
*** p<0.01	** p<0.05	* p<0.1

Determinants of participation in collective asset management.

Models (11) and (12) seek to capture the relationship between participation in collective asset management, and social capital and trust, respectively:

$$\begin{aligned}
 \ln part_commons_i &= \beta_0 \\
 &+ \beta_1 \ln cs_f_i + \beta_2 \ln cs_c_i + \beta_3 \ln cs_v_i + \beta_4 educ_i + \beta_5 sit_ocup_i \\
 &+ \beta_6 rural_i + \beta_7 mujeres_i + \beta_8 edad_i + \varepsilon_i \quad (11)
 \end{aligned}$$

$$\begin{aligned} \ln part_commons_i & \\ & = \beta_0 \\ & + \beta_1 \ln conf_inter_i + \beta_2 \ln conf_inst_i + \beta_3 educ_i + \beta_4 sit_ocup_i + \beta_5 rural_i \\ & + \beta_6 mujeres_i + \beta_7 edad_i + \varepsilon_i \quad (12) \end{aligned}$$

Where all variables have been previously defined.

What is the role of social capital and trust in community participation associated with collective assets?

Finally, Table 7 shows the estimation results of (11) and (12). The results reveal that participation in the management of collective assets is positively correlated with linking social capital and institutional trust. In other words, **people engage in the management of collective assets within their territories when they trust institutions more and when they are more connected to people in power.**

These results are broadly related to those obtained when exploring the determinants of access to collective assets: again, connection with actors who have influence and political power increases community participation. In addition, however, there is the positive and significant

influence of institutional trust: one participates more when one is more confident that such participation will have a result.

Both models show that this participation is also positively influenced by the fact of belonging to rural areas. In other words, people living in rural areas are more involved in the management of collective assets. This could be linked to the fact that there are more collective assets in rural areas. On the other hand, it could be connected to limitations of our survey: the diversity of public spaces, community use resources, and other types of collective assets in urban areas was not sufficiently considered in our design.

Table 8: Determinants of participation in the management of collective assets

	$\ln part_commons_i$	
	Modelo 11	Modelo 12
$\ln cs_f_i$	-0.094 (0.121)	- -
$\ln cs_c_i$	-0.023 (0.021)	- -
$\ln cs_v_i$	0.126*** (0.016)	- -
$\ln conf_inter_i$	- -	-0.044 (0.072)
$\ln conf_inst_i$	- -	0.423*** (0.117)
$educ_i$	0.004 (0.012)	0.019 (0.012)
sit_ocup_i	-0.014 (0.010)	-0.021** (0.010)
$rural_i$	0.283***	0.307***

	(0.035)	(0.035)
women _i	-0.024	-0.028
	(0.033)	(0.034)
age _i	-0.001	0.001
	(0.001)	(0.001)
Const.	0.516	-1.106***
	(0.447)	(0.407)
Obs.	1,200	-0.044
R²	0.123	(0.072)
Reference Values		
<i>Robust standard errors in parentheses</i>		
*** p<0.01	** p<0.05	* p<0.1

In summary: our models indicate that **collective action for the articulation of self-help resources (e.g., *ollas populares*) contributed to the decrease in economic vulnerability** during the first year of the pandemic. In addition, we found that this type of collective action **is influenced by the presence of linking social capital**, that is, with the connection that individuals have with people in power. On the other hand, **collective assets make it possible to reduce economic vulnerability**, through access to them as well as participation in their management. These assets include community water and sanitation

systems, community public spaces, among others. Moreover, both access to and management of these collective assets are positively related to the presence of linking social capital. This positions **linking social capital as one of the main determinants of collective action articulation** during the COVID-19 pandemic in Paraguay. Finally, the articulation of self-help and participation associated with collective assets are, in essence, forms of **citizen participation**, so we could aim to strengthen participation processes and capacities as a resilience strategy.

Conclusions and Implications for Public Policy

The most salient findings are listed below, followed by some implications for public policies and future studies

1. The articulation of collective actions for civic demands is not correlated with bonding or collective social capital, but has a positive relationship with the existence of linking social capital. That is, people organize to realize their demands when they have greater connections with people in power.
2. The growth of institutional trust decreases the capacity to articulate civic demands.
3. The increase in people's links with individuals who are in power (linking social capital) increases the community's capacity to articulate community actions by 15%.
4. Institutional trust decreases community action, indicating that individuals with a higher degree of trust in institutions tend to organize themselves to a lesser extent to carry out community actions.
5. The public institutional response during the COVID-19 pandemic was positively and significantly related to the vulnerability of individuals and not to demands for help or links with people in power. In addition, it can be observed that belonging to rural areas, being a woman and of advanced age, increases the public institutional response. This suggests that aid from public institutions responds to the needs of certain vulnerable sectors of the population.
6. Community action decreases the vulnerability of individuals in a statistically significant way.
7. Access to collective assets decreases the vulnerability index of individuals by more than 15%, which suggests that when people have access to collective assets within the community, they are less likely to be in situations of vulnerability.
8. Not only does accessing collective assets decrease vulnerability, but participating in community activities to manage them is also an important factor in decreasing vulnerability.
9. Institutional trust and linking social capital influence this participation.

10. A higher level of education contributes to a decrease in vulnerability, while belonging to rural areas and being female increase it.

How can we increase **access and facilitate participation in the management of public spaces and other collective assets**? How can we **strengthen the networks of mutual aid and social capital** that were activated during the pandemic to reduce vulnerability? How do these questions relate to **territorial development dynamics**? The path to which this work leads us seems to point towards the design of programmatic interventions that answer these questions as a nodal strategy of a sustainable development portfolio that increases the resilience of our communities.

Based on the observations of the study, a possible mechanism to reduce vulnerability from public policies and development interventions stands out as a possible answer to these questions: the activation of interpersonal relationships with institutional authorities for the construction and strengthening of collective assets that reduce vulnerabilities. Two implications can be considered for the design of interventions.

First, generating greater access and connection with institutions specifically designed to channel support for investment in collective assets can be a very effective mechanism for reducing vulnerability. For this reason, strengthening existing citizen participation, such as neighborhood commissions, district development councils and public hearings, is fundamental. Currently these instances involve little of the population and usually in a consultative manner. Broadening the participation and incidence of these spaces in local public policy can have an important impact in enabling greater collective action for self-help and the construction of collective community assets.

Second, processes could be designed specifically for the participatory financing and design of community infrastructure (e.g. green spaces, sports and leisure infrastructure, community educational services, etc.) to be promoted by public institutions to strengthen community resilience. This approach would easily integrate

with the emerging “social innovation” approach to resilience and health that public institutions such as the National Innovation Strategy (ENI) and the National Council for Science and Technology (CONACYT) are adopting in Paraguay.

In this context, a possible follow-up to the present study could be a social innovation process aimed at neighborhood commissions for the participatory design of community spaces, in which the decisions of the commissions are linking in terms of the use of a designated budget for the

construction and operation of some community space or service with the potential to reduce vulnerability. This type of intervention, with an experimental or mixed (qualitative-quantitative) impact evaluation methodology, would allow us to evaluate causal relationships that are difficult to interpret from cross-sectional data such as those presented in this study. Specifically, we could observe the effect on the process of building new community assets and their operation on the levels of trust, social capital and vulnerability.

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