The Role of ICTs in the Management of Citizen Initiatives led by Women from Vulnerable Communities of Bañado Sur de Asunción During COVID-19

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Abstract

The purpose of this paper is to analyze and describe the use and role of ICTs during the pandemic generated by COVID-19, in vulnerable communities led by women from Bañado Sur in Asuncion, Paraguay. We focus mainly on the citizen initiative called "ollas populares", which emerged as a response to the lack of food security that was exacerbated by the pandemic in vulnerable territories. Based on two case studies, we explore how ICTs helped (or not) in the resolution of the food security problem through community collective action, led by women, identifying criteria for the use and design of ICTs for collective action in crisis contexts. The theoretical framework of social capital, understood as the set of interpersonal and trust networks that are built around individuals and groups in society, and that influence collective action and community resilience, serves as a framework for analyzing and discussing the case studies. In the two cases studied, we observe how the use of ICTs allowed the expansion of the support networks of the women who led the collective action of the soup kitchens in these communities. This article discusses these results and the main lessons learned from the case studies we analyzed.

Keywords

ICT, Social Capital, Vulnerability, Community networks

1. Introduction and motivation

The crisis context generated by the pandemic caused by COVID-19 at the global level has mainly affected the most vulnerable areas. As the pandemic has progressed, governments have had to face new challenges. While countries initially focused on mitigating the effects of stringent health restrictions, as the weeks passed their attention shifted to a particularly serious threat: the economic and social crisis.

Particularly in Paraguay, the effects of the pandemic were exacerbated in the Bañados, areas located on the outskirts of the city of Asunción on the banks of the Paraguay River, which are characterized by a very precarious socioeconomic environment, with shortages that include the absence of public services and basic infrastructure necessary for community and human development. In these areas, people are mainly engaged in activities that are currently outside the formal economy, such as the collection and separation of recyclable materials directly from landfills. In this context of high vulnerability, one of the central problems during the pandemic was food insecurity, which led to the emergence of initiatives promoted by the government, religious, social and civil organizations, private

institutions, faculties, the citizenry and, mainly, collective community self-help action, the central expression of which was the soup kitchens[2].

Communities led by women, especially, started their activities driven by solidarity, promoting the organization of the soup kitchens, in order to mitigate the lack of food security.

Various ICT tools, such as instant messaging and digital maps, were some of the main means to articulate the supply and demand of aid. Understanding how they were used and what impact they have generated was one of the main motivations of this work, since the analysis led to suggestions, recommendations and proposals for the adoption of technology design or strategies that contributed to strengthen the networks and links of these communities. Due to the characteristics of the leadership of these initiatives, this work especially analyzed the role played by women in the use and interaction with ICTs, in the articulation of community initiatives and their relationship with their environment.

In this research, the theory of social capital is used because there is evidence of its positive impact on development and resilience, before, during and after moments of crisis caused by natural or unexpected events [1] [2] [3] [4].

Specifically, we integrate this concept in the analysis of the role of the use of ICTs as a means of expanding aid networks[3].

To learn how women leaders in vulnerable communities articulated aid during the COVID-19 pandemic and how they used ICTs to meet their food security needs, we sought to answer the following questions:

RQ1: What did the women's communities of Bañado Sur do, to meet their food security needs?

RQ2: How were women's solidarity networks from vulnerable communities in Bañado Sur mobilized during the pandemic?

RQ3: How were ICTs used by women leaders in mobilizing aid to meet food needs?

RQ4: What are some criteria or design recommendations to take into account when seeking to strengthen social capital and aid in times of crisis through ICTs?

The main objective of this project was to analyze and characterize the solidarity networks of women leaders in Bañado Sur, and the role that ICTs played in strengthening (or not) these networks, with a focus on the issue of food security, studied through the phenomenon of the soup kitchens during the period of the COVID-19 pandemic.

This objective is specifically disaggregated into three other objectives:

● To analyze the forms of ICT use by women leaders in Bañado Sur, for the articulation of aid in the popular pots.

● To analyze the use and role played by these media in two selected case studies.

● To formulate hypotheses and recommendations on this use and role.

In the remainder of this paper, we present in the second section the Conceptual Framework and Related Works, which defines the main elements of social capital theory, as an organizing framework for our analysis of results; then we present the State of the Art and related studies, regarding the role of ICTs as means of expanding aid and their relationship with community social capital, and how both contribute to the reduction of vulnerability. In the third section, we present the Context, materials and methods, where we describe the Methodology we used and the Design and research activities carried out. In the fourth section, we begin the Discussion of the Results obtained from the previous activities. In the fifth section, we continue with the Conclusions, Recommendations and possible Solutions that could be more sustainable in the long term, in order to achieve the proposed objectives. Finally, in the Acknowledgements section, we mention the collaborators who made this research work possible.

2. Conceptual Framework and related works

The study used social capital theory as a conceptual framework where we understand social capital as the relationships of trust and interpersonal networks that individuals build within society[4]. We used social capital as a theoretical framework because it is one of the factors that contribute to disaster

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[2]The cooking pots consist of preparing food for a large number of people collectively with food provided by the families themselves, or through donations made by individuals or public or private organizations (Flores, 2020; Benítez, 2020; Hardy, 2020). Source: "Research on Las ollas populares como una estrategia de resiliencia ciudadana". Ana Lucia Giménez, Cristhian Parra, Mónica Ríos, Gustavo Setrini.

[3] Social Informatics: Perspectives, Examples, and Trends Steve Sawyer Pennsylvania State University Kristin R. Eschenfelder. University of Wisconsin-Madison CHAPTER 10, Pág. 428. 2002

[4] https://www.conacyt.gov.py/sites/default/files/Tesis-Pabla_Frutos.pdf

resilience (Pelling, 1998; Pelling 2003; Nakagawa and Shaw, 2004; Adger et al., 2005; LaLone, 2012; Méndez, 2012), especially in peripheral or marginal environments, since it allows organized civil society to respond to their own needs and influence the city government according to their interests and not those of actors outside the problem [5] [6].

2.1. Conceptual framework

During the quarantine generated by COVID-19, the women of Bañado Sur constituted an extremely important available social capital, since they were the main drivers of the increase in community kitchens to mitigate food security needs. In this context, this paper considers that food security implies: having food available, that there is a way to get it (for example, money to buy food), that this food is sufficient, safe and nutritious so that the body can get the energy and nutrients necessary for a healthy life[5].

Social capital refers to trust, norms and networks that facilitate social coordination and cooperation for mutual benefit (cultural conception)[6]. From the structural conception (Burt, 2000; García-Valdecasas, 2011), social capital is associated with the resources to which an individual or collective can have access due to the relationships it has with the members of the social network, understanding resources as materials and information [6].

The literature conceptualizes three types of social capital linkages:

1. Filial (Horizontal) Social Capital: Filial social capital describes connections between members of the same community, such as friends or family, that result in close ties to a particular group[7].
2. Connective Social Capital (Horizontal): Connective social capital describes connections between dissimilar groups, which can occur with acquaintances (friends of friends) who are reached through social groups related to class or race[8].
3. Binding Social Capital (Vertical): Binding social capital describes connections between ordinary citizens and those in power. 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[9].

The issue of food security and its resolution through the organization of soup kitchens represents an example of resilience, in which communities mobilize their networks and trust, which represent their social capital, to mitigate the impact of the pandemic on food insecurity experienced by vulnerable individuals. In this sense, 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[10]. Finally, we understand resilience as "the ability of a neighborhood to cope with crises such as disasters and engage in effective and efficient recovery through coordinated efforts and cooperative activities" [1].

2.2. State of the art and related studies

The state of the art study was divided into two stages: in the first stage, articles were reviewed referring to the theory of social capital, vulnerability, resilience, related to ICTs. In the second stage, articles were reviewed to answer three research questions.

We then provide a brief overview of how ICTs are connected to the dynamics and concepts of social capital and resilience. As interactive and mobile ICT infrastructures become increasingly accessible, they transform how social capital is generated and allocated. This has enormous implications for society and the economy.

ICT can play an increasingly important role in social learning and the sharing of knowledge and knowledge-based resources within communities of practice, especially now that network infrastructures and network access are becoming more widespread. But all this will not happen automatically. It is necessary to go beyond and design a paradigm focused on functionality and external appearance. The

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[5] https://ayudaenaccion.org/ong/blog/sostenibilidad/que-es-la-seguridad-alimentaria/

[6] Putnam, R. D. (2000). Bowling Alone: America's Declining Social Capital. In Culture and Politics. https://doi.org/10.1007/978-1-349-62397-6_12

[7] Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. Academy of management review, 27(1), 17-40.

[8] Granovetter, M. S. (1973). The strength of weak ties. American journal of sociology, 78(6), 1360- 1380.

[9] Szreter, S., & Woolcock, M. (2004). Health by association? Social capital, social theory, and the political economy of public health. International journal of epidemiology, 33(4), 650-667.

[10] https://www.py.undp.org/content/paraguay/es/home/library/el-capital-social-durante-la-pandemia-en-Paraguay.html

use of ICTs in social practice and their challenges to traditional conceptions of time and space present new challenges to social organization, reorganizing those structures and processes that create social capital [7].

There are several studies on community organizations and social networks supported by ICTs, in relation to the process of social appropriation of ICTs as instruments of communication and social organization for local development [8]. Some studies place the Internet as a cost- and time-efficient way to generate or maintain social capital through connective or bridging relationships, regardless of the degree of isolation in which people live. However, the type of resources that can be accessed through these networks is still conditioned by geographic distance [9].

The literature consulted indicates that there are close relationships between social capital and the impact of ICTs. What they have in common is that both are bridges that contribute to the development, increase and improvement of aid to vulnerable communities, especially in times of crisis [10] [11]. The first lesson learned from the literature is the importance of group association in any collective action. If people are associated, they can achieve a common good for the members belonging to the group [12]. It is important to expand networks and trust in any society by using technology to help each other and leave no one behind[11].

In the systematic analysis of the state of the art: we analyzed articles that answer the research questions, according to the problematic RQ1 and RQ2. We searched for articles to answer the specific objective of our study, RQ4. The database used where the keyword string was searched was the CICCO database. The inclusion criteria were articles in English and Spanish. The date range selected was from 2016 to 2021 and peer-reviewed articles. With this search we found 48 articles that were selected by country, category, topic and group.

Studies in Latin America were scarce with this search string, at the time of the search only one Latin American country, Argentina, was found among the 12 articles read [13].

2.2.1.   Brief learning of the state of the art based on the research questions.

RQ1: What did the women's communities of Bañado Sur do to meet their food security needs?

In relation to this question, we found that communities in similar situations of vulnerability carried out the following activities to address food security needs: community gardens to meet basic needs [14], community seed banks [15], fish hatcheries [16], seaweed farming [17], conservation farming practices as a way to boost the achievement of food and nutrition security using social capital [18].

RQ2: How were the solidarity networks of women members of vulnerable communities in Bañado Sur mobilized during the pandemic? The evidence found in similar situations within the literature was urban agriculture, which women have used as an alternative urban space, with or without government approval [19]. They were also creating linkages with food providers for food provision in such communities [20]. Through citizen participation [21]. The most relevant evidence observed in the communities studied was the use of social networks as an effective means of communication and the sharing of food supplies for the soup kitchens [26].

RQ4: What are some design criteria or recommendations to take into account when seeking to strengthen social capital and aid in times of crisis through ICTs? - Achieving decentralized records generated during transactions in the food supply chain, using blockchain technology (smart contracts) [22], to ensure more transparent and accurate management, meeting the objectives of providing food security, boosting good health and general well-being. - Importance of ensuring quality and food safety certification from the initial supplier to households (supply chain network [23]. - Precision agriculture, using blockchain infrastructure, generating new agricultural systems and e-agriculture schemes [24].

3. Context, materials and methods

The work presented focused on the communities of the Bañados de Asunción (specifically the San Cayetano and Tacumbú neighborhoods, Figure 1) and the women who actively participated in the coordination, support or management of the ollas populares, also known as community kitchens, during the COVID-19 pandemic between July 2020 and October 2021.

The communities studied, which represent the main unit of analysis of this work are: the "Organización Coordinadora Lucha por la Tierra", hereinafter (OCLT); "Jóvenes Voluntarios del

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[11] https://www.un.org/sustainabledevelopment/es/sustainable-development-goals/

Bañado Sur", hereinafter (JVBS), belonging to the San Cayetano neighborhood, including some areas of San Miguel, Caacupemí and San Ignacio. (Three smaller and locally defined neighborhoods that are part of San Cayetano); and the "Centro de Ayuda Mutua Salud para Todos", hereafter (CAMSAT) of the Tacumbú neighborhood.

The objective of the study was analytical, we sought to derive hypotheses to answer the question: How do women from vulnerable communities use ICTs? The timing of the study was retrospective since the phenomenon studied had already occurred at the beginning of the research.

This research analyzed the role of ICTs in the articulation of help and community action in vulnerable communities led by women, based on two case studies: the popular pots of San Cayetano and Tacumbú. The territories studied are those defined in San Cayetano and Tacumbú, by the National Social Pastoral, as communities or religious groups, to whom they provide aid, which are located south of downtown Asuncion; these neighborhoods resemble satellites forming rings between them, Figure 1.
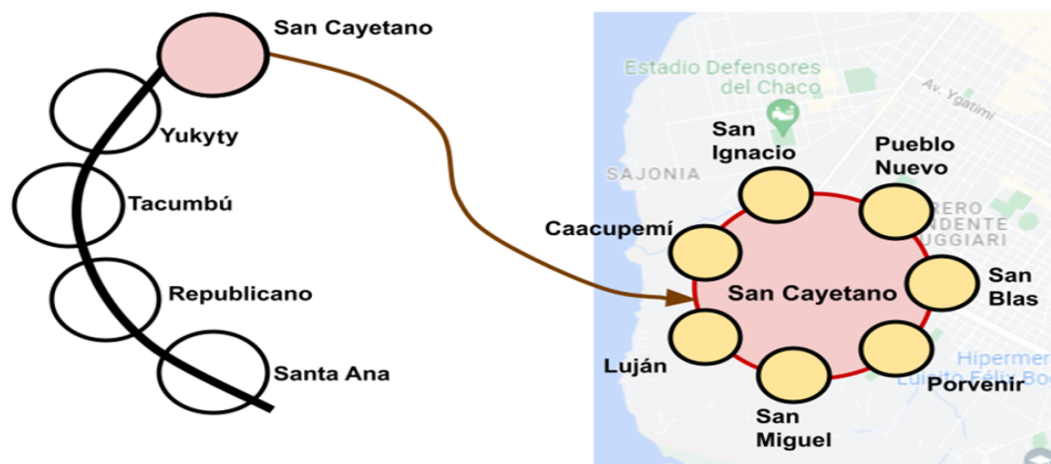

Figure 1: Location map of San Cayetano and Tacumbú. Source. Tekoha Renda Magazine. http://pastoralsocialnacional.org.py/category/tekoha-renda/

3.1. Methodology

We started from the premise that social capital, social relationships and interactions are key factors in improving collective support in the communities we work with.

We used an ethnographic design research approach, immersing ourselves in the context to conduct participant observations and using qualitative methods, combined face-to-face and remote interviews (via audio or text messages and phone calls) with key women from community kitchens. Focused on how canteen organizers and volunteers articulated and coordinated their activities and how they used ICTs (e.g. WhatsApp, social networks and other more traditional ICTs), to meet their food security needs. Key lessons emerged from these research activities, which will be the basic input for a series of future Participatory Design workshops.

In general, our design research approach uses Human Centered Design principles and tools, including the use of scenarios in a Scenario Based Design process. The final outcome of this study will be presented through "Design Scenarios", focusing mainly on the typical analysis and design stages of the framework proposed by Rosson & Carroll [25], which helps to generate design recommendations for future ICT prototyping and evaluation processes for vulnerable communities.

Finally, we used the "A day in the life" tool, to prototype technological designs. In this context, this research falls within the area of Social Informatics, providing an interdisciplinary design of solutions to understand and strengthen community social capital in vulnerable communities in response to crises supported by the role of ICT as a means to ask for and receive help [26].

Our study was based on 27 qualitative interviews with the beneficiaries of the 6 soup kitchens of San Cayetano and 1 soup kitchen of the Tacumbú community kitchen. We interviewed: 2 local residents; 7 women leaders, 4 young leaders, from the San Cayetano community kitchen; 1 university volunteer sympathizer from Juvensur (Sub-organization of OCLT). In Tacumbú, some members of the

CAMSAT[12] Organization were interviewed: 1 main leader of the Organization, 1 announcer of the Radio Tape Pyahu 87.9 "La voz de la Rivera"[13], 1 Coordinator of the Organization, 1 member of the organization, 1 member of the organization's board of directors. 1 Coordinator of the Organization, 1 Social Communicator, 2 cooks, 1 kitchen assistant, 1 security guard of the premises. In addition, some IT experts, such as 1 creator of the Wenda Platform[14] and 1 of the AyudaPy Platform[15]; 1 expert of the National Innovation Strategy (ENI)[16]; 1 Researcher of the CONACYT, project of legalization and realization of manuals of recommendations for the popular cooking pots[17]; 1 expert researcher of Human Centered Design; 1 volunteer who was part of the solidarity aid networks of the Office of the First Lady (ODP)[18]; 1 leader of the Guerrilla Verde Solidarity network, who won a UNDP award in Paraguay, in the creation of a vegetable garden in Bañado Sur[19].

3.2.   Research design and activities carried out

1. Systematic analysis of the state of the art: based on the research questions, the state of the art was conducted through a systematic search of articles based on the keywords associated with the three research questions.

2. Mapping and selection of cases: in the first stage, preliminary interviews, field visits and analysis of existing data and documents were carried out to describe the problem in general and then select two specific cases of cooking pots on which we delved into the questions of our study. The following methods were used:

a) Semi-structured interviews with key actors through a qualitative interview selection method.

b) Preliminary descriptive analysis of existing documentary resources on the ollas populares in Paraguay, such as the digital maps created during the Wenda pandemic and AyudaPy.

3. In-depth and detailed case studies: once the case studies were selected, the following activities were carried out to deepen the study of each case:

a) Mapping of actors and networks in each selected case through field visits and documentary review.

b) Semi-structured interviews and in-depth focus groups on the uses of ICTs with the women leaders of the pots.

c) Thematic content analysis of the interviews and focus groups.

d) Cultural probes and diary studies to systematically document the use of ICTs during the beginning of the quarantine from March 2020 to October 2021 in the management of the cooking pots.

e) Additional quantitative or qualitative analyses from existing documentary resources, including:

i) Digital maps created during the pandemic[20].

ii) Surveys conducted "as indicated by several studies [27], [28] ..."[21].

iii) Other studies that have been conducted [29].

4. Scenario-Based Design: in English "Scenario-Based Design" (SBD) [25], from the data and analysis generated in the previous activities, digital documents of each case and generation of abstract scenarios describing the activities, information, and interactions observed through the deepening activities. Figure 2.

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[12] https://camsatorg.wixsite.com/camsat/about

[13] https://www.facebook.com/pages/category/Radio-station/Radio-Tape-Pyahu-879-FM-La-Voz-De-La-Ribera-367958453686866/

[14] Wenda: plataforma articuladora que integra y potencia iniciativas locales valiéndose de ser una trabaja colaborativo público privado. https://wenda.org.py/acerca-de

[15] AyudaPy: plataforma donde la gente que necesita ayuda puede realizar sus pedidos de ayuda y quiénes quieren ayudar pueden hacerlo de una manera sencilla y geolocalizada. Marcelo Elizeche. https://ayudapy.org/

[16] https://innovacion.gov.py/

[17] https://www.conacyt.gov.py/

[18] http://www.mujer.gov.py/index.php/noticias/ninez-mujer-economias-creativas-y-voluntariado-seran-prioridad-de-la-odp

[19] https://www.py.undp.org/content/paraguay/es/home/blog/2021/Conoce-a-los-ganadores-de-Moiru--Guerrilla-Verde.html

[20] See map.wenda.org.py for an expanded map of COVID-19 related initiatives.

[21] AccLabPY   (2020).   Aprendizaje   para   el   Desarrollo: ¿qué   funciona   y   qué   no?.   Blog. https://www.py.undp.org/content/paraguay/es/home/blog/2020/Aprendizaje-para-el-Desarrollo-que-funciona-y-que-no.html
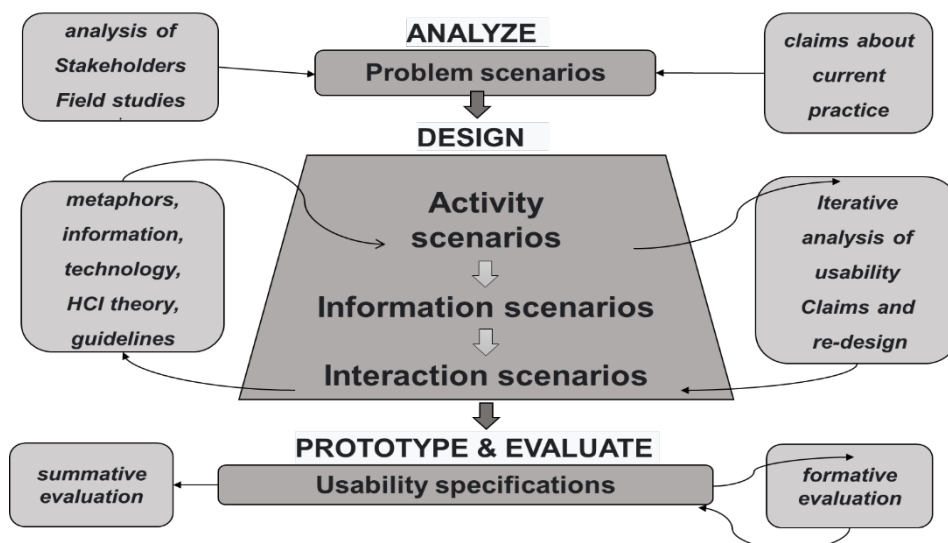
Figure 2: An overview of the scenario-based design (SBD) framework. Scenarios serve as a central representation throughout the development cycle, first describing the goals and concerns of current use, and then being successively transformed and refined through an iterative design and evaluation process (from Rosson & Carroll, 2001b).

4. Results discussion

In this section we describe the main results, organized into themes and categories, which emerged from the analysis carried out.

1. Needs exposed by the COVID-19 Pandemic in Bañado Sur

One of the main needs visible during the beginning of the quarantine that affected the most vulnerable sector, was the lack of daily income for sustenance, when they stopped receiving the daily income that covered food, mothers and young people decided to increase the already existing soup kitchens and ask for donations from citizens while waiting for money transfers from the State. In this regard, the lack of access to smartphones and internet represented a barrier to request state aid. In addition, actions to mitigate the spread of the coronavirus was hand washing. However, one of the problems faced by the community of San Cayetano is access to drinking water.

2. General problems in the San Cayetano neighborhood

The problems surveyed were: lack of good nutrition, deficient water supply, lack of opportunities to excel, lLack of decent work, fair remuneration, Poor infrastructure (flooding, no sewage drainage, etc.), shortage of public transportation, environmental problems, starting with sparse vegetation and intense heat, very poor education, lack of technology, digital divide, health system and service scarce, deficient and difficult to access, prevalence of social insecurity: robberies, crimes, etc., lack of trust.

3. General problems of the Tacumbú neighborhood

In the context immersion and participant observation in the Tacumbú neighborhood conducted in the month of May 2021, during the field visit at the facilities of the CAMSAT Organization, the problems mentioned by the actors interviewed are: the abundance of informal workers, such as recyclers, car caretakers, weed remedy sellers, etc. of low profitability, the lack of funds or money to continue to maintain the ollas populares, the social exclusion of these groups by society, there is an Internet connectivity point of MITIC[22], but it does not work well, the signal is very bad, Internet connection is insufficient for 80% of school-age children and adolescents living in these communities, hindering their access to virtual classes, little help from the state.

4. Solutions provided by community action

In the San Cayetano neighborhood, the Coordinating Organization Fight for the Land was studied, some sub-organizations such as: the grandparents' dining room, Father Pepe Marangatu Balpuesta,

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[22]MITIC: Ministerio de Tecnologías de la Información y Comunicación de Paraguay.

Juvensur, Organization 1811 Youth Independence and the Organization "Young Volunteers of Bañado Sur", led almost entirely by women fighters and leaders of vulnerable neighborhoods.

During the quarantine, the Coordinating Organization Lucha por la Tierra, from the San Cayetano neighborhood and its sub-organizations, distributed food for approximately 3,000 people, including lunches and/or snacks. The Young Volunteers of Bañado Sur, distributed 1700 meals per day for 195 people and co-helped 4 soup kitchens.

The CAMSAT organization, from the Tacumbú neighborhood, started distributing 750 plates of food per day at the beginning of the pandemic, then decreased to 350 plates. In addition, they followed and disseminated the rules of access protocol of sanitary hygiene and use of masks, for the entrance to the community dining room using ICTs. The cooking pot initiatives, from both neighborhoods.

5.   Community organizations and initiatives

As part of our preliminary field visits and the interviews conducted, an abstraction of the social capital network that came into play in Bañado Sur emerged after several iterations, based on the actual evidence observed. In Figure 3, we made the conceptual diagram showing different aspects of social capital: bonding (union, filial or social bond, horizontal), bridging (bridge, social connective link, horizontal) and linking (linking, social binding, vertical). Trust and help are shown as elements of bonding social capital between the leader, volunteers, coordinators and residents. Social capital can be linked with different parties interested in offering help, such as other similar communities, NGOs and/or universities. The linkage of social capital is usually with the local government or administration [30]. Stakeholders are represented by the white ovals among which are several groups of residents from different neighborhoods, one or several volunteer groups, one or several coordinators, and key leaders, painted yellow. Private entities are represented by rounded rectangles. Non-governmental organizations (NGOs) are represented by hexagons. Local government entities are represented by shaded squares. Interactions and helping relationships are represented by purple bidirectional arrows and trust between actors are represented by blue bidirectional arrows. Finally, the green unidirectional arrow represents the aid coming from outside the country.
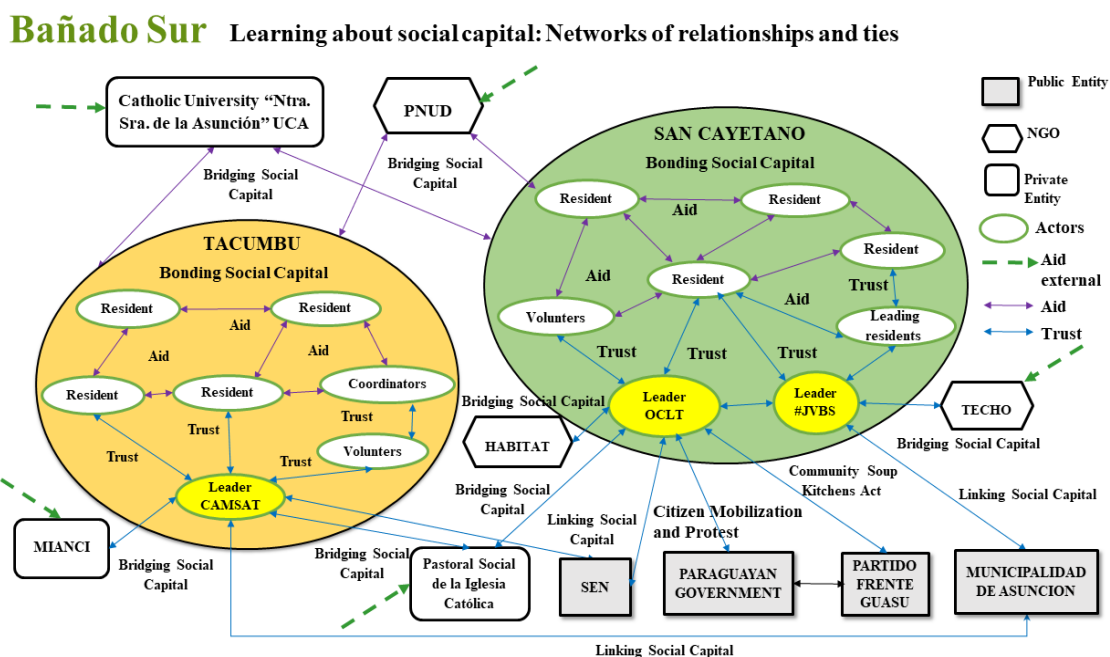

Figure 3: Type of relationship: Bonding, Bridging and Linking of social capital. Own elaboration based on the model of Nakagawa & Shaw, 2004.

6.   Requests for Help

Faced with the lack of resources to cover basic needs, the women leaders of Bañado Sur made their requests for help in the form of donations of food supplies such as milk, fruits, vegetables, dry goods and utensils for cooking pots. These requests were made to friends, fellow students, citizens in general, Catholic and Evangelical churches, social organizations, Non-Governmental Organizations (NGOs), volunteer groups, the State, schools, universities and the Municipality of Asunción, among others.

Thanks to the dissemination of these initiatives through ICTs, they requested the Government to recognize the "Ley de ollas populares", which was enacted by the Legislative Power under Law No. 6603 (Support and Assistance to the popular pots organized throughout the territory of the Republic of Paraguay during the pandemic declared by the World Health Organization by the COVID-19). The movement of Young Volunteers of Bañado Sur, in coordination with the women, before any situation of vulnerability, evaluates the needs looking for sponsors and organizations that can help. To do so, they use computers, phone calls, social networks, etc. They draw up a list of beneficiaries, with personal data and follow up with them through WhatsApp and Facebook. In the case of CAMSAT, in the Tacumbú neighborhood, the help received was mainly from religious associations and groups of anonymous entrepreneurs, etc.

7. Perceptions about ICTs and the platforms for articulating the demand and supply of help

The perceptions of the women leaders of the soup kitchens on the use of ICTs, the social networks they have used and on the use of the Wenda and AyudaPy platforms were: In the San Cayetano neighborhood, the perception was: "It has to be facilitated so that most people have access to the Internet. The platforms exist and I believe they are very efficient and effective... but the difficulty is the medium through which it is transmitted, the Internet, the lack of accessibility to the Internet due to the cost and the low signal that exists in the sectors of the Bañados". Interviewed Juvensur leader. "Technology has been very useful during the pandemic", is the conclusion reached by the leader of the grandparents' dining room. Interviewee.

In Tacumbú, a very interesting conclusion is reached in the interview with the leader of the organization. "The virtual environment is fundamental today; I think it is a human right. Just as today a government has to guarantee that people have water, that people have electricity, I believe that today the government has to guarantee that all citizens have access to technical means of communication, many things today are solved and done by these means, that is my perspective." Leader of the CAMSAT Organization.

In Tacumbú, the broadcaster of the radio station Tape Pyahu 87.9 FM "La Voz de la Rivera", said that they made great use of technology, received training and used the radio as a means of disseminating community news. Regarding the exploration of the Wenda and AyudaPy platforms, the CAMSAT social communicator said, "I found it quite interesting and that we can take advantage, we had no knowledge about this tool, I could see that it is a map where you can search by people's needs, see the area, see the water, and we could use that, for example, with our coastal strip project.... ".

Based on this, there is room to explore the use of specific platforms such as the ones mentioned and analyze their potential impact on empowering social capital and obtaining more sustained support over time.

8. The role of ICTs

For the dissemination of the requests for assistance, in general, the women leaders contacted the press to present their requests and claims. They made flyers, videos or audio messages and disseminated them through the technological tools described below:

1. WhatsApp: Women in both neighborhoods frequently used WhatsApp. They obtained positive responses in the first place, with the use of WhatsApp, to organize paperwork, ask for help, make calls to meetings, channel communication with solidarity networks and/or the press, followed up on their activities, and accounted for donations received and distributed.

2. Instagram: The women leaders of the JUVENSUR organization, initially made their requests through WhatsApp and Facebook, asking for help from their friends and colleagues, however on Instagram, was where despite having fewer followers and contacts, they got more response to their requests for help.

3. Facebook: San Cayetano organizations headed by women, made flyers and posted them on Facebook. It is important to mention that in the case of the leaders of the Juvensur organization, although they have many followers on this network, the response to the publications was low. In San Cayetano and Tacumbú, the women used Facebook to publish photos of the donations and to follow up on the beneficiaries; as a channel of accountability to their solidarity networks or sponsors who provided them with aid.

4. Radio stations: The organizations of popular cooking pots led by empowered women from San Cayetano communicated, according to their needs, with the community radio stations available in the Bañados and with those with the largest audience in Asunción and the Metropolitan Area. In

Tacumbú they used the radio Tape Pyahu 87.9 FM "La Voz de la Rivera", as the main means of communication.

5. Television channels: In San Cayetano, women leaders and referents called the press to make their requests for help or complaints. Were interviewed by several media outlets to channel their requests. The use of traditional media, such as television, was supported by volunteers, faculty students, parents or friends of the young people from all the organizations.

On the other hand, the television press contacted the CAMSAT coordinator by telephone. They took notes and live links that have allowed them the diffusion and reach of the community kitchens and the activities they carried out. In this sense, the impact achieved thanks to the diffusion on television is greater, although the help obtained through this media is also ephemeral and short-lived.

6. Specific platforms: in response to the COVID-19 pandemic, we used specific platforms such as Wenda and AyudaPy, to promote articulation between various sectors in the country. However, the organizations in the neighborhoods under study did not use them.

In both territories studied, regardless of the means by which they learned about the soup kitchen experiences and the work carried out, different people communicated with the organizers to offer their donations. It should be noted that in both neighborhoods, poor Internet connectivity made it difficult to receive help.

5. Conclusions, recommendations and solutions

The different activities and interventions we developed through this research helped us shape four potential design challenges based on the insights we found:

1.   Solutions to expand and improve community connectivity

The use of WhatsApp as the main tool to coordinate activities in each of the cases indicates that these communities have a need for constant connectivity. However, the San Cayetano neighborhood does not have a connectivity point nearby and although in Tacumbú there is one in the organization's facilities, the Internet connection is very poor. To solve this problem, the actors resorted to Internet packages that cost approximately U\$ 1.5 per day, a very high cost considering the degree of vulnerability we found in these communities. In this context, designing interventions that help to expand and improve community connectivity could have a positive impact on increasing food security in these communities, given the importance of ICTs to build social capital and thus generate collective actions to mitigate vulnerability [26].

The solution to get ahead economically is for every household to have Internet connectivity, and consequently vulnerability will be highly reduced, especially in vulnerable communities [31].

2. Solutions to improve local logistics and mutual assistance coordination

Regarding the local logistics of the organizations we studied, we found two different realities. On the one hand, although the organization Coordinadora Lucha por la Tierra has been operating for 12 years, the logistics are mainly emergent, since meals are prepared in some canteens or precarious houses of those who coordinate the actions. On the other hand, CAMSAT has a long history of 32 years of operation and is organized according to a horizontal leadership, where the actors and partners of the organization are volunteers who avoid clientelism. The organization has its own infrastructure that helps coordinate activities in a more centralized manner. In both cases, ICTs serve as a communication channel to organize efforts. They use Whatsapp and community radio to communicate the locations where social canteens are concentrated each day, and Microsoft Excel to organize the stock of donations. They also use Facebook to report on the status of donations and, notably, CAMSAT also uses emails to communicate with its stakeholders. These observations suggest the key role of both a physical infrastructure and an integrated system that could address all the interaction needs that initiatives have with all beneficiaries, donors and the community. Thus, interventions with a focus on building collective assets, such as community kitchens, or a community platform that systematizes the donations and needs of each soup kitchen, could significantly improve the efficiency and reach of the collective actions articulated in Bañados [26].

3. Solutions to expand the reach of soup kitchens and meet their needs in a more sustainable way.

The press, and specifically television, is the most effective tool for publicizing soup kitchen initiatives and, therefore, generating public interest in donating more resources. However, as mentioned by some interviewees: "the help lasts a short time... only 3 days", indicating that this massive diffusion and the solidarity it generates in the citizenship is ephemeral. Although both agree that the supportive

response generated by the press audience is ephemeral, it is interesting to note the difference between San Cayetano and CAMSAT. In San Cayetano, the community "goes looking for the press", while in CAMSAT, the press comes looking for them. This difference is mainly explained by the connective social capital that CAMSAT leaders have developed over the last 32 years. The results show that building social capital is a very important issue that should be addressed by public interventions or policies aimed at ensuring food security in these communities. In other words, although initiatives could count on the press to reach households, a more sustainable network of support and donations would be available if these communities [26].

4. Solutions to make better use of existing community resources and collective assets.

One of the most striking findings is that there is an Internet connection point offered by MITIC, but it did not emerge as a relevant resource used by the interviewees. This opens a door to analyze the reasons why this resource is not being used effectively while one of the needs most mentioned by the organizers of the community kitchens was the lack of Internet access. Therefore, exploring what other resources such as public spaces, community radios, parks, among others could be better utilized to propose interventions in these communities. This is particularly important as access to and management of community commons could improve the level of trust by increasing the likelihood of articulating collective actions. Moreover, as the production and maintenance of community commons can be a vehicle to decrease territorial vulnerability [28], [29], addressing this issue could be a very interesting strategy to improve food security levels in these communities [26].

5. Future Work

In the next steps of this research, we will seek to extend the preliminary findings that describe the social capital of Bañado Sur to other similar or dissimilar groups. In this way, we will be able to make an in-depth analysis of the networks that exist in the communities and how they generate collective initiatives to overcome adversities articulated through ICTs. Part of this future research will also include the analysis of data collected at the country level in the Objetivo Paraguay investment map (Wenda and AyudaPY platform).

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