

***Sutichay*: A solution to spot citizens' needs after humanitarian and natural disasters in Peru**

Jesús Gutiérrez

Kenji Moreno

Fabiola Ventura

Adrián Tamariz

Abstract

For a long time, failures of information systems in Peru have been hampering the response to crises and disasters, as well as the effectiveness of public interventions in non-catastrophic contexts. A recent example of this is the current SARS-CoV-2 pandemic. To contain the spread of the virus, the Peruvian government implemented strict social distancing measures. Due to the potential risk of such measures on the normal income perception by households, especially among the most vulnerable, the government provided different types of assistance to the population. However, poor information systems reduced the quality of their targeting and effectiveness, and contributed to a significant increase in the country's poverty indicators. To address this issue, we designed *Sutichay*, a live-updated geolocation-based tool for a timely and effective identification of vulnerabilities affecting a population after a disaster or crisis. By its design, *Sutichay* offers a cost-efficient solution using technology to a structural flaw such as the State's limited capacity to collect information. In this document we detail how *Sutichay* operates, as well as the necessary conditions to make it sustainable and make it work at its fullest potential. We also show that *Sutichay* would have been very supportive during the current pandemic and other most recent major disasters in Peru. With this initiative, we seek to contribute to a better management of disaster risks and consequences, as well as increase the protection of Peru's residents, especially to the more than 18 million people in vulnerable situations.

Keywords

Crises, disasters, public policy targeting, social vulnerability, basic needs, infrastructure gaps, emergency response, information systems, technologic-ended solutions, humanitarian aid, citizen-oriented solutions.

Acknowledgements

We warmly thank Eduardo Canales, Álvaro García, Hori Taneki and Patricia Pérez for their support and comments, which were key to increasing the quality of this project.

Team Description



Jesús Gutiérrez is a MSc in Economics candidate at Universidad del Pacífico in Peru. He also holds a Bachelor's Degree in Economics from the same university. He currently works as Research Assistant at the World Bank. He previously worked as a researcher at the Red de Estudios para el Desarrollo, and as an impact evaluation and data analyst at the Ministry of Education. His main fields of interest are education, health, poverty, and gender.



Kenji Moreno is currently pursuing a Master's Degree in Economics at Universidad del Pacífico in Peru. In addition, he holds a Bachelor's Degree in Economics and Finance from Universidad Peruana de Ciencias Aplicadas in Peru. He currently works as a Research Assistant at the Inter-American Development Bank (IDB). He previously worked performing economic and social analysis at the Ministry of Economy and Finance, and at the Ministry of Education. His main fields of interest are public finance and development policies.



Fabiola Ventura is currently pursuing a Master's Degree in Human Development at Pontificia Universidad Católica del Perú and a MicroMaster Program in Data, Economics and Development Policy at Massachusetts Institute of Technology. She holds a Bachelor's Degree in Economics from Universidad del Pacífico and a specialization in Poverty granted by Oxford University. She currently works as Public Affairs Deputy Manager in Azerta. She has previously worked for the Ministry of Economy, the Ministry of Industry, the Prime Minister's Office, and the World Bank. Her fields of interest are public management, development, and poverty.



Adrián Tamariz is a graduate from the Master in Public Policy at Sciences Po Paris, specializing in Politics and Public Policy. He also holds a Bachelor's Degree in Economics and Public Policy from Universidad Peruana de Ciencias Aplicadas in Lima, Peru, as well as a specialization on Sustainable Development and Corporate Social Responsibility by ESAN Graduate School of Business. He has previously worked on economic, political, and social analysis for public and private organizations in Peru and Latin America. He is currently Project Manager at the international CEO-led coalition Business for Inclusive Growth (B4IG).

Contents

Glossary	4
1. Introduction	5
2. Sutichay Design	7
What is Sutichay, and where does its name come from?	7
Who participates in Sutichay and what are their roles?	7
Why would the community participate in Sutichay?	8
How does Sutichay work?	10
What coverage would Sutichay have offered in previous disasters?	14
3. From idea to business	16
Governance	16
Project finance	18
Potential risks	19
Road map and timeline	20
4. Conclusions	21
5. Bibliography	23

Glossary

COVID-19: Coronavirus disease 2019

DGS-PCM: Digital Government Secretariat of the Presidency of the Council of Ministers

ECLAC: Economic Commission for Latin America and the Caribbean

FEN: “*El Niño Costero*” phenomenon

GDP: Gross Domestic Product

ID: Identity Document

INDECI: National Institute of Civil Defense

INEI: National Institute of Statistics

KPI: Key Performance Indicator

MEF: Peruvian Ministry of Economy and Finance

MIDIS: Peruvian Ministry of Development and Social Inclusion

MINEDU: Peruvian Ministry of Education

MINSA: Peruvian Ministry of Health

MTC: Peruvian Ministry of Transports and Communications

MVCS: Peruvian Ministry of Housing, Construction and Sanitation

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2

SBS: Peruvian Superintendency of Banking, Insurance and AFP

1. Introduction

The ongoing COVID-19 pandemic has triggered multiple development crises in all countries around the world, making governments face unprecedented challenges to protect people's health, as well as their economic and social well-being. This issue has been particularly complex in the Latin America and the Caribbean region, where more than 34 million infections and nearly 1.1 million deaths have been recorded to date¹, as well as a substantial drop in the regional Gross Domestic Product (GDP)².

In Peru, one of the region's and the world's most affected countries by the pandemic, the damage has not been minor. According to the national Ministry of Health, there are close to 200,000 deaths due to COVID-19³, meaning that, most probably, Peru is the country with the highest death rate in the world⁴. Moreover, its economy, largely praised for having had uninterrupted growth for more than a decade, suffered an important setback with a drop of 11.1% in the GDP in 2020.⁵ Consequently, social progress was also affected, with a setback on poverty reduction, and the index going from 20.2% in 2019 to 30.1%. This means that more than 3.3 million Peruvians fell into poverty⁶.

The country's social system has faced other crises before, mainly after natural disasters in one or multiple regions, such as floods, earthquakes, and landslides. One recent example is the *Fenómeno de El Niño Costero* (FEN)⁷, a climatological event that occurred in 2017, affecting more than 285,000 people in 13 of 24 regions.⁸ Another case is the 2007 earthquake in Ica region, of 8.0 magnitude, striking the country's central coast with 596 deaths, 1,294 severely injured people and more than 450,000 affected individuals.⁹ In both cases, transport and sanitation infrastructures were severely damaged, restricting families' access to food and essential goods, and forcing them to look for improvised shelters.

Whether it is by a natural hazard or by a pandemic, the Peruvian social system has proven to be highly vulnerable to fall into disaster, making authorities and social actors take important and urgent policy decisions based on poor information. An exemplary case was the ambitious Reconstruction Investment Plan in response to the FEN event, accounting for 7% of the GDP, and

¹ Reuters (2021). As of June 10th, 2021.

² ECLAC (2021).

³ MINSa (2021).

⁴ Fowks (2021). As of June 1st, 2021.

⁵ INEI (2021a).

⁶ INEI (2021b).

⁷ Climatic phenomenon that originates in the Pacific Ocean and periodically affects the coast of Peru and Ecuador. It is characterized by a sustained increase in sea temperature and by its impacts on the marine ecosystem and air temperature. Its consequences are, mainly, heavy rains, overflowing rivers and seas, leading to floods.

⁸ INDECI (2017). It is important to note that this was the third most intense "El Niño" phenomena in the last 100 years.

⁹ INDECI (2009).

with actions mainly based on unverified damage declarations issued by local governments. This led to high incongruencies such as having one region declaring damages as large as three times Peru's total stock of road infrastructure.

The consequences of having non-updated information systems were also evident during the COVID-19 pandemic. To reduce the impact of a strict quarantine, the Peruvian government implemented a cash transfer program for highly vulnerable households. This group was specially targeted due to its dependence on informal economic activities not adaptable to the new context. A low degree of financial inclusion,¹⁰ along with incomplete, outdated household records,¹¹ made the delivery of transfers very difficult. Moreover, the government was unable to know families' location and the magnitude of their needs.¹² These issues prevented 260,000 families from receiving transfers despite being eligible according to the established criteria.¹³ Also, it is likely that vulnerable households not receiving transfers, or doing so but late and/or insufficiently, broke the imposed lockdown to work and have earnings, exposing themselves to be infected by the virus.

The aforementioned experience leads us to believe that, with poor information systems, policy responses tend to be inappropriate, making disasters affect the poor and vulnerable¹⁴ larger than any other social groups, by reducing their already low levels of education and health - in summary, making them more fragile.¹⁵ According to the National Institute of Statistics (INEI)¹⁶, in 2019, 20% and 34% of Peruvian households were poor and vulnerable, respectively. Furthermore, the Venezuelan *diaspora* has brought more than a million migrants to the country, of which 90% have a job in the informal sector, without any type of social insurance benefits.¹⁷ All things considered, Peru's residents under a condition of fragility during the pandemic accounted for more than 18 million people.

It is clear that having the right information is crucial to design and implement appropriate policy interventions. While it is under the responsibility of local governments to do so, we believe that citizens can take a role to improve their actions. Following this philosophy, we propose the creation of **Sutichay**, a cost-efficient virtual platform aiming to collect information on the vulnerability conditions faced by households and its members after a disaster or crisis.

¹⁰ According to the Superintendency of Banking, Insurance and AFP (SBS), as of 2019, only 40.4% of adults had a bank account.

¹¹ The main source of information was the most recent Census, conducted in 2017 with some criticism regarding data recollection.

¹² Defensoría del Pueblo (2020).

¹³ Díaz-Cassou et al. (2020).

¹⁴ According to INEI (2020), households are considered vulnerable if they are not poor but are at risk of falling into poverty when a negative shock occurs on the economy.

¹⁵ Dayton-Johnson (2006).

¹⁶ INEI (2020).

¹⁷ INEI (2019).

2. Sutichay Design

What is Sutichay, and where does its name come from?

Sutichay is a technological solution aiming to address the multiple dimensions of vulnerability a household might be facing after a disaster or crisis. It will allow citizens under such a context to register their basic needs related to food, clothing, and housing; as well as difficulties in accessing basic services such as health, transportation, and education.

Sutichay takes its name from the Andean Quechua language, in which it means “to make visible”. Such significance is aligned to the solution’s main objective: serve as a technological tool for authorities and key actors to promptly identify the location and characteristics of vulnerable people after a natural or humanitarian disaster, helping them carry out timely and effective decision-making processes.

Who participates in Sutichay and what are their roles?

i) *Citizens* – Any person residing in Peru that faces needs, due to a natural or humanitarian disaster, and decides to log on the platform using its identity document (ID) number. Once logged in, the individual will be capable of registering its immediate needs on food, clothing, and shelter, specifying quantities and other characteristics needed for logistics planning (e.g., food storage capacity or access to a refrigerator). It will also be able to register damages affecting its community’s infrastructure of basic services. Photographic registers and georeferences can also be registered.

ii) *Facilitators* – Public and private institutions that will help Sutichay to be accessible to all its potential users. In a preliminary way, three categories of facilitators are identified: schools, telecommunications companies, and massive consumption enterprises.

- Firstly, for Sutichay to be an effective tool, it must ally with establishments that are: (1) easily identified by citizens, authorities, and social actors; and (2) located close to as many citizens as possible. Schools (private and public) satisfy both conditions. On one hand, since 2014, the Peruvian Ministry of Education (MINEDU) has been recording the georeferenced location (latitude and longitude) of all private and public schools in its territory. Those registries have been improved year by year in order to be as accurate as possible. On the other hand, in 2019, there were more than 53,724 public schools (primary and secondary) and, according to the National Households Survey, they covered almost 100% of children between 6 and 11 years old – and around 84% of children between 12 and 16 years old nationwide, respectively.

As part of the Sutichay project, schools will provide assistance on three main lines: i) offer training and information to use the platform correctly, ii) provide computers with internet connection to allow access to the platform, and iii) serve as delivery or collection points for families to receive the requested resources. Schools could also serve as warehouses or shelters during emergencies. However, it is important to note that this last option faces risks and limitations, as the school infrastructure could be damaged after a disaster (see Section 3 for

further details on potential risks). Overall, the main advantages of using schools are their easy identification and nearness, in benefit of citizens, authorities and social actors.

- Secondly, considering current gaps in internet access and quality, Sutichay will ally with telecommunications companies to ensure uninterrupted access to the platform during critical events. For this, Sutichay will rely on ongoing Governmental infrastructure projects that have already appointed private contractors for the provision of internet services. This, following the Peruvian Ministry of Transports and Telecommunications' (MTC) guidelines on regional connectivity networks, in favor of strategic public institutions (schools, health centers and police stations). Hence, Sutichay will partner with telecommunications companies deploying infrastructure on interest areas to release charges for navigating through the Sutichay's platform during these critical events.
- Finally, looking to guarantee a proper expansion, as well as a sustained use of the platform, Sutichay will ally with massive consumption enterprises willing to offer discount vouchers to active users (see next headline for further details on behavioral nudges and incentive schemes). In compensation for it, these will be allowed to subtly advertise and offer non-compulsory surveys in the platform. Overall, massive consumption enterprises are considered key allies as they concentrate relevant products and categories for household's consumption baskets, and because they manage decentralized distribution channels that assure its offer and presence nation-wide.

iii) Authorities – Local or regional leaders that will access information collected via Sutichay and use it to improve their first responses to the disaster or crisis, as well as the support needed to address further aftermaths. They will not be able to access the individual, personal information of reporting individuals, only aggregates at a community level.

iv) Social Actors – Other non-governmental organizations who will have access to the aggregated needs of communities and their location details, in order to provide humanitarian support, in addition to the delivered by authorities.

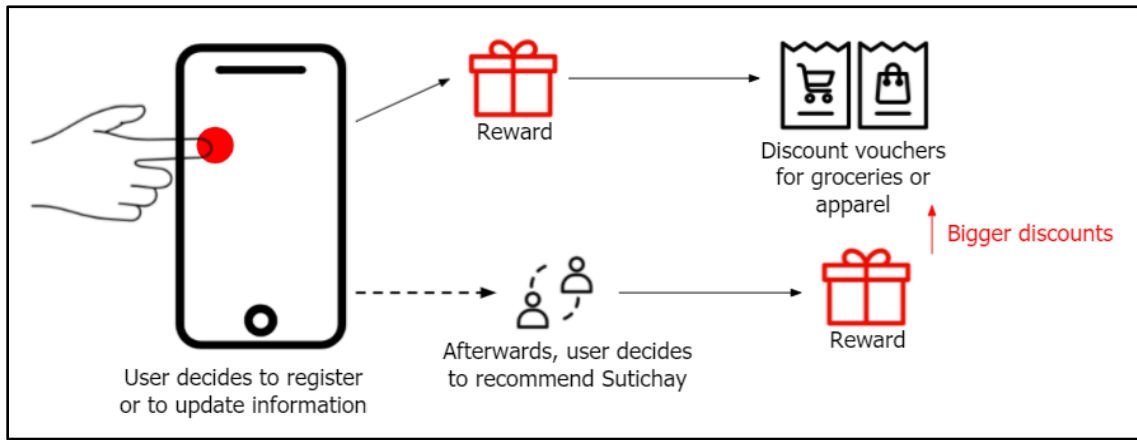
Why would the community participate in Sutichay?

After a crisis or disaster, citizens would be motivated to use Sutichay because they understand the platform as a prompt way to communicate their needs to authorities and social actors. However, to be more effective, it is necessary that people register themselves before an emergency occurs. Therefore, it is key to offer sufficient incentives to citizens, so they are motivated to register and upload information. Likewise, it is also essential to offer incentives to facilitators and authorities to perform their roles, as well as to provide sustainability to the digital ecosystem in general.

i) Citizenship – In a regular context (this is, before a disaster) any person residing in Peru will be allowed to register their current necessities (mainly related to access to basic services and infrastructure). To encourage citizens to nurture the platform in non-disaster contexts, those who participate will access a group of benefits (e.g., discount vouchers for grocery shopping). Also,

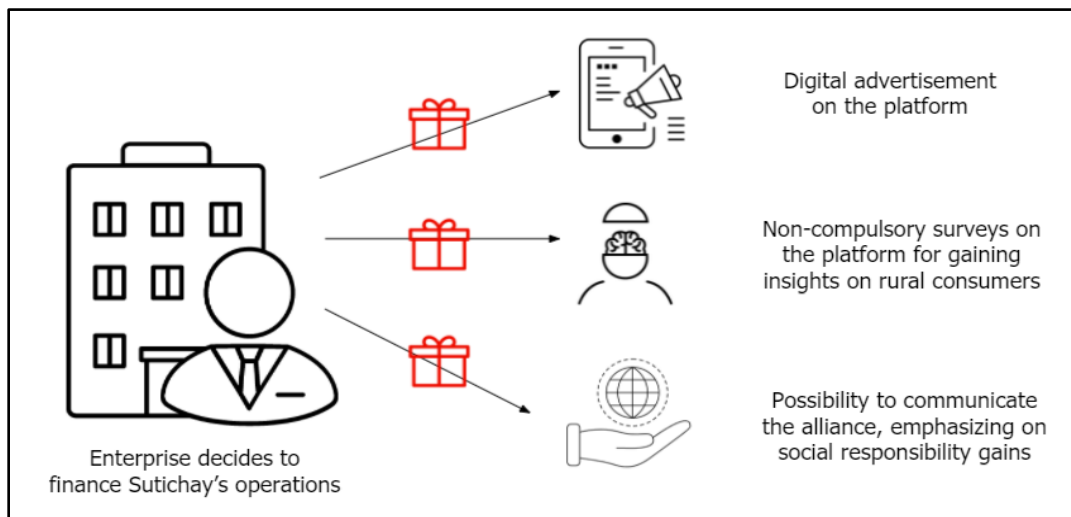
rewards for citizens will increase if new members sign up due to their recommendation. This incentive scheme is presented in Figure 1.

Figure 1. Incentive scheme for citizenship



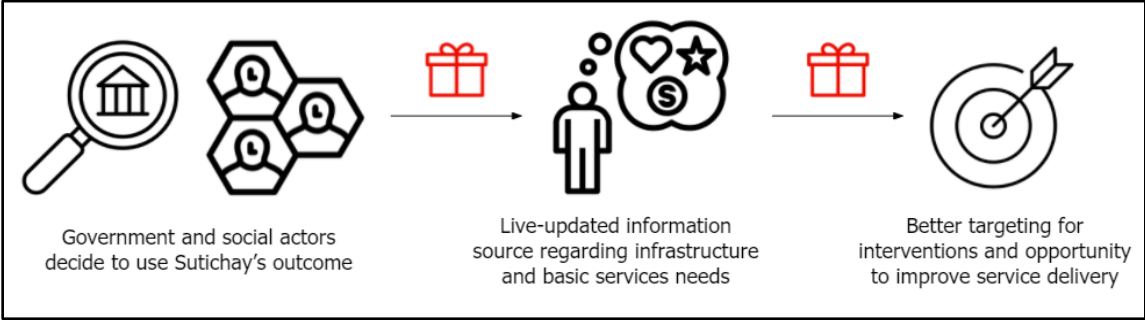
ii) *Facilitators* - In a non-disaster context, the platform will seek to partner with massive consumption enterprises so they can offer discount vouchers and partly fund the platform's operation. In return, facilitators will have the opportunity to place subtle advertisements and offer non-compulsory consumption surveys - this last will pioneer as a great part of users will be consumers living in rural areas, of which there's little evidence about consumption patterns. Finally, facilitators will be allowed to communicate their support on Sutichay, presenting it as a proof point of their social responsibility efforts. This incentive scheme is presented in Figure 2.

Figure 2. Incentive scheme for facilitators



iii) *Authorities and social actors* – In a regular non-disaster context, the platform will be expected to serve as a live-updated information source regarding infrastructure and basic services’ needs, and consumption patterns – as a result of citizens’ interactions. Although it is recognized that the declared needs would not represent an accurate calculation on access gaps related to basic services and infrastructure, it would give a notion of the urgency of some areas compared to others. Hence, it is anticipated that areas with less access to basic services and infrastructure report more needs than those with greater access. In this way, authorities and social actors could improve the quality of the targeting of their interventions; and therefore, their administration’s results on service delivery. This incentive scheme is presented in Figure 3.

Figure 3. Incentive scheme for authorities and social actors

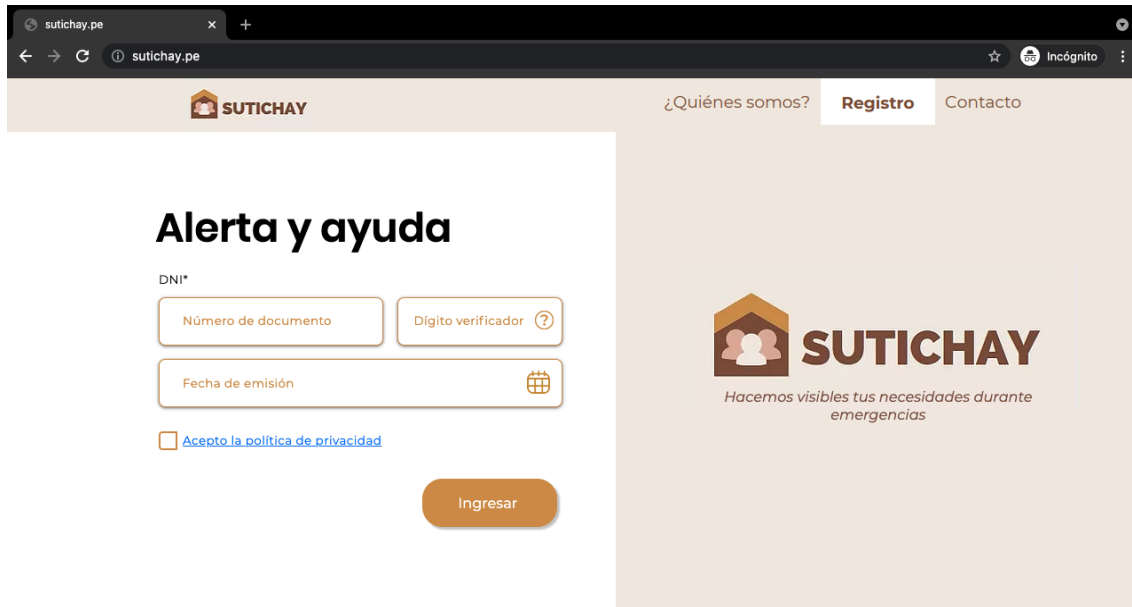


How does Sutichay work?

Sutichay aims to collect information about the conditions of vulnerability faced by households and its members, through an easy-to-use virtual platform, which will be firstly deployed as a responsive web page. It should be taken into account that many people, especially in rural areas, are not familiar with the use of this type of virtual tools due to the lack of basic digital skills and the scarce access to technology. For this reason, Sutichay would need support from the government and its allies to impulse several information and training campaigns on how to use it correctly. In urban areas, information campaigns on media (television, radio, social media, among others) could prove effective, while in rural locations, face-to-face workshops will have higher effectiveness.

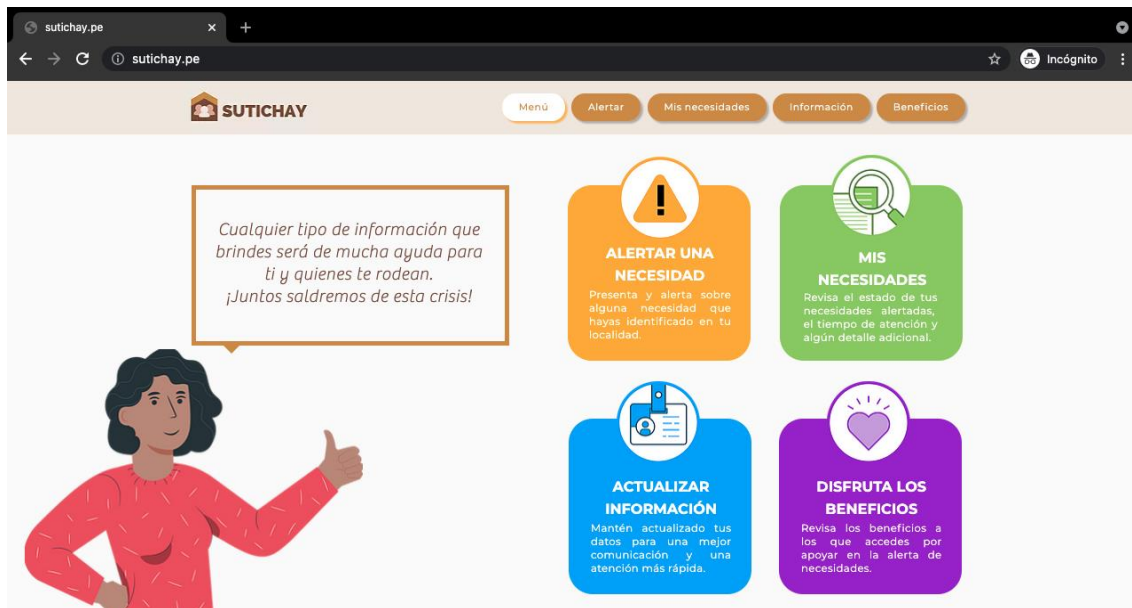
Below we include some illustrations on the steps required to sign up in the platform using the identity document, register a need, as well as other features. Note that registration would optionally require an email address, which would be useful for communication purposes.

Figure 4. Login visualization



Then, the following options will appear on the home screen: "Alert a need", "My needs", "Update information", and "Enjoy benefits".

Figure 5. Home visualization



If we select the option "Alert a need", the platform will request relevant information about the type of disaster that occurred (natural or humanitarian), as well as the requirements that need to be addressed urgently. Thanks to the school's geographic coordinates, Sutichay will automatically assign the nearest public or private school to serve as a collection point for the requested support.

Figure 6. "Alert a need" visualization



When selecting the option "My needs", the platform will list the alerts history, as well as its specific status. Each alert included geographical characteristics, and associated feedback by authorities and social actors.

Figure 6. "My needs" visualizations





When choosing the option "Update information", users will be able to register and update their personal information (date of birth, gender, location, etc.), as well as their current needs (mainly related to access to basic services and infrastructure).

Figure 8. "Update information" visualization



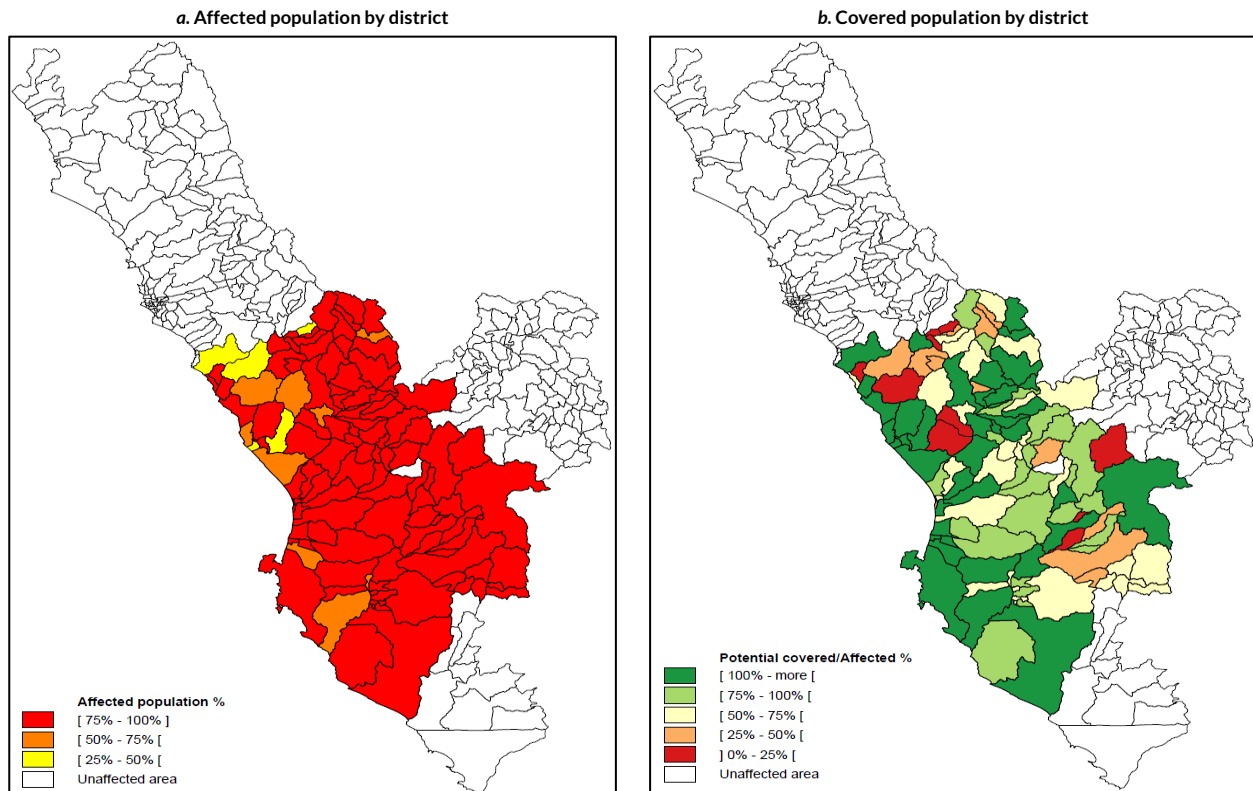
Finally, if we select the option "Enjoy benefits", Sutchay will show the number of accumulated points and all the accessible benefits offered by the aforementioned Facilitators.

What coverage would Sutichay have offered in previous disasters?

To establish some notion of Sutichay's effectiveness, we need to compare its potentially covered population with the population that was effectively affected by past disasters. We estimate the potential covered population for different years based on the maximum student capacity of each school and the regional average number of members per household. The actual affected population in real disasters is obtained from databases built by the National Institute of Civil Defense (INDECI). Our analysis was conducted considering the following past disasters that occurred in the country: Ica earthquake (2007), FEN (2017) and the beginning of the pandemic (2020). The results, shown in Figures 9-11, give us an idea of the areas that could have received aid in the aftermath's initial stage.

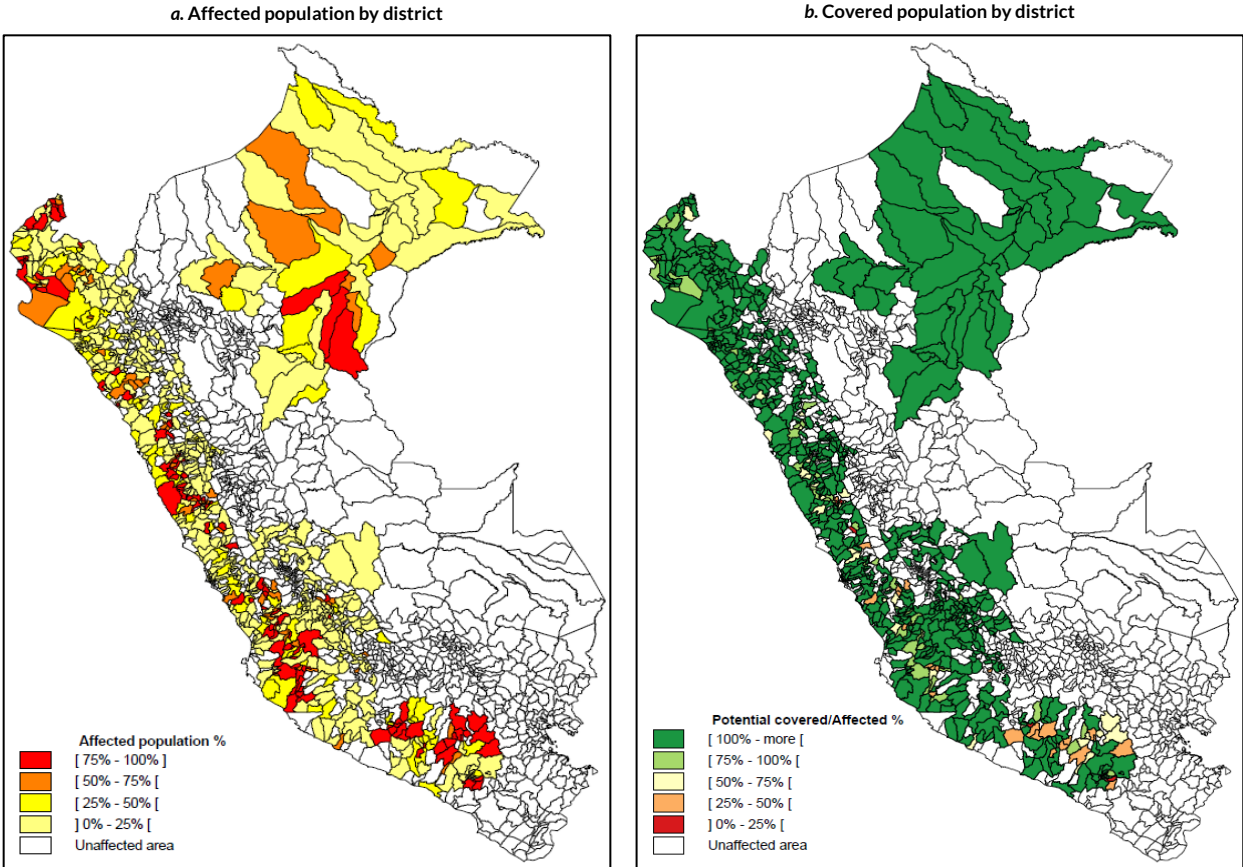
Firstly, panel *a* in Figure 9 shows that in 2007, in many districts of Ica and southern Lima, more than 75% of the population was affected by Ica's earthquake. In most cases, assistance was required in the form of temporary housing and basic necessities such as food, footwear, clothing, among others. Panel *b* shows how many people Sutichay could have helped through the use of schools as care centers compared to the number of people affected by that crisis. It can be seen that our platform could cover more than 50% of the affected population in most cases. There are few cases in which the coverage would have been low, for which it is recommended to add other support strategies.

Figure 9. Affected population by Ica earthquake and potential covered population by Sutichay (2007)



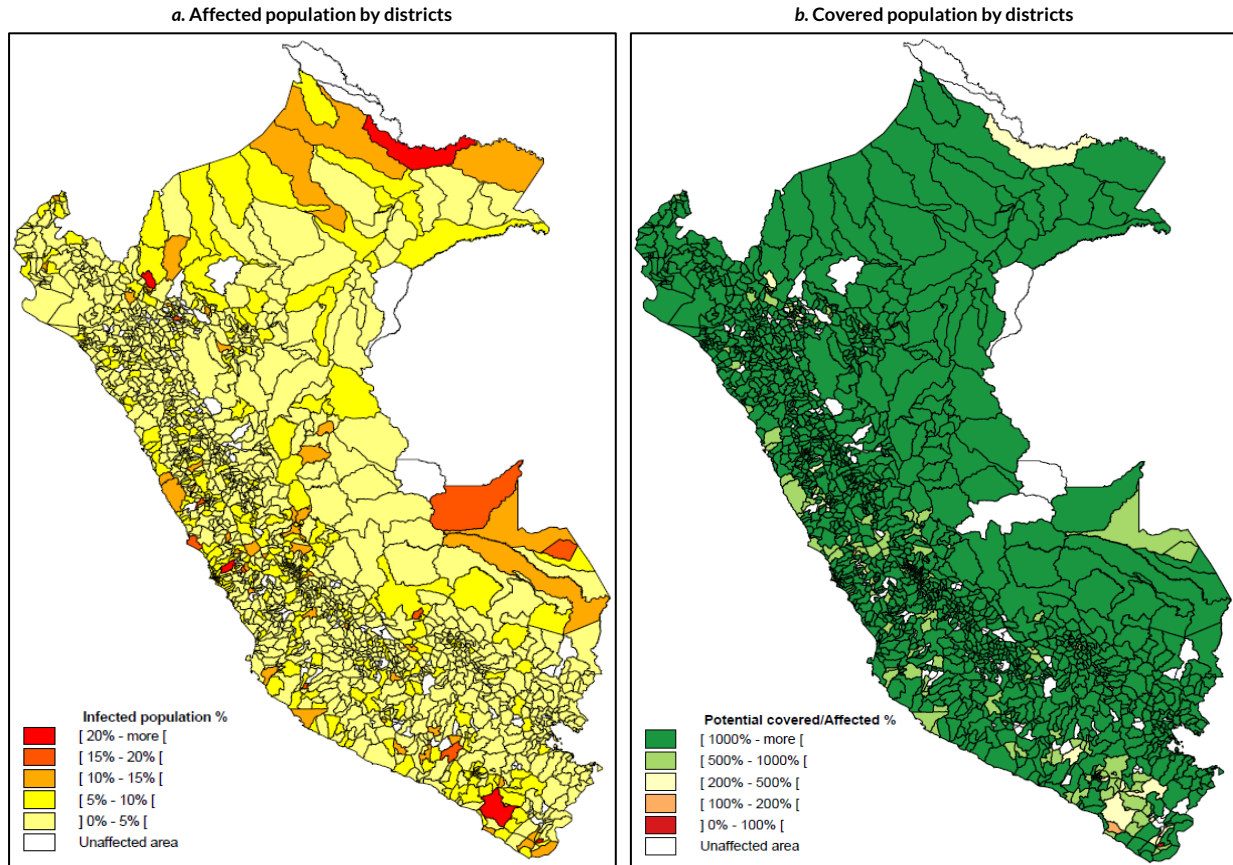
Secondly, Figure 10 shows a similar dynamic for the case of the FEN (2017). Panel *a* shows some heterogeneity in the affected rate by the FEN at the national level. However, Sutichay’s coverage would appear homogeneous and above the total affected people in most districts. In this case, the type of assistance required was similar to Ica’s earthquake, which means Sutichay could have been very helpful in this type of crisis as well.

Figure 10. Affected population by the FEN and potential covered population by Sutichay (2017)



Finally, Figure 11 shows how Sutichay could help in the most recent crisis: the COVID-19 pandemic. We define the affected rate as the number of infected people divided by the total population in each district. It can be seen that a great percentage of people were affected due to the pandemic. However, if we assume that a larger number of infected people in the household reduces household income, Sutichay could be helpful in order to send food and other types of assistance to individuals. As we can see in panel *b*, Sutichay could cover more than ten times people affected in most districts.

Figure 11. Affected population by the COVID-19 and potential covered population by Sutichay (2020-2021)



3. From idea to business

Governance

Sutichay aims to be a simple, easy to use platform, relying on technological infrastructure rather than a big group of professionals. However, since it addresses a multifaceted problem such as social vulnerability, it would be pertinent to have it managed by a governmental entity capable of coordinating intersectoral actions. Considering the high-level and inter-sectoral mandate the Presidency of the Council of Ministers (PCM) has accounted during the last three disasters or crises, addressed on this proposal (COVID-19, Fenómeno de El Niño Costero and Ica's earthquake), we believe Sutichay should be directly attached to it. Moreover, bearing in mind that Sutichay represents a technological-ended solution, we consider a prominent role from the Digital Government Secretariat of the same institution.

This secretariat would manage the technological deployment of Sutichay, along with its financial needs and the coordination with other relevant Ministries, such as Development and Social Inclusion, Health, Education, Transports and Communications, among others. Moreover, DGS-PCM

is legally entitled to define guidelines under which data collected by Sutichay will be accessed and used. It also is in charge of defining and deploying all the authentication mechanisms under which citizens would be able to access the platform.¹⁸

Having Sutichay under the management of an entity at the Presidency of the Council of Ministers is also convenient for the coordination of policy responses, between different sectors of the Cabinet of Ministers, and different levels of government. Other relevant entities for Sutichay's development are:

i) *Ministry of Economy and Finance (MEF)* – In charge of managing public resources and ensuring appropriate funding for the deployment of national policies. Our platform could help the different sectors and levels of government to better target their expenses and investments when responding to a disaster or crisis. In that sense, it is aligned to the MEF's goal of effectiveness and quality in public spending. Additionally, Sutichay would not significantly increase public spending, since it would be coupled with existing public policies focused on disaster risk management and care for the vulnerable population.

ii) *Ministry of Education (MINEDU)* – In charge of the database including the location of all schools in the country's territory. Through the 246 Local Educational Management Units (known as UGEL in Spanish) all over Peru, it can ensure that schools provide free support for the correct use of Sutichay; as well its transformation into delivery points for communities who need aid.

iii) *Ministry of Health (MINSA)* – In charge of acting towards the benefit of the population's health and well-being, it could use Sutichay's information to improve the first response after an emergency.

iv) *Ministry of Development and Social Inclusion (MIDIS)* – In charge of programs to improve the quality of life of the population in vulnerable situations. Since it coordinates interventions to bridge the gaps in the access to public services and opportunities for economic growth, this ministry would be very interested in the information collected by Sutichay both in regular and emergency situations.

v) *Ministry of Transports and Communications (MTC)* – In charge of integrating the country through the development of transport, communications and telecommunications systems and infrastructure. Thus, the importance of MTC within the Sutichay project would be directly related to its ongoing guidelines on regional connectivity networks, in favor of strategic public institutions (schools, health centers and police stations). Overall, the platform could ease the path for assuring school's connectivity nation-wide, as it will prove in favor of potential outcomes due to uninterrupted internet services.

vi) *Ministry of Housing, Construction and Sanitation (MVCS)* – In charge of promoting sustainable territorial development within the country. Faced with a disaster that affects the housing and sanitation of citizens, this ministry could also take advantage of Sutichay's information to improve the targeting of its measures and financial resources.

¹⁸ Presidencia del Consejo de Ministros (2021, February 19).

vii) *National Institute of Civil Defense (INDECI)* – Key actor within the National Disaster Risk System as it holds an immediate mandate to collect and distribute first-aid donations at the event of national crises or disasters. This institution would be strongly interested in Sutichay as it could serve as a tool to improve its intervention’s targeting.

We trust that the authorities will be able to make appropriate respectful use of the information for the purposes of the platform. In the scenario in which it is not possible for a government entity to administer Sutichay, we would carry out prototypes with NGOs. In this second case, the objective will be to develop tools that ensure the appropriate use of the information generated by Sutichay.

Project finance

Sutichay’s financial projections are developed based on expected incomes and expenses. Three categories are considered as income sources: 1) financial support obtained directly from facilitators, with an annual basis growth goal; 2) fundraising supported on donations, to be channeled through facilitator’s consumer and supplier networks; 3) potential consulting business line, to be developed on findings from infrastructure and basic services’ needs. This last to be offered starting from the second year of operations onwards.

In addition, two categories are considered as expense sources: 1) platform development, which contemplates initial and additional investments, plus expenses related to general operations and maintenance; 2) administrative expenses based on a constantly growing team. This considers annual expansions on team salaries’ budget, increasing office expenses as well. Finally, an item for tech consultants or experts is reserved, foreseeing any technological demand.

Overall, a break even, considering accumulated expenses, would be reached in the fourth year of operations.

Table 1. Project finance based on annual incomes and expenses

Concept	2022	2023	2024	2025	2026	2027	2028	2029	2030
INCOME (in USD)									
<i>Financial partners (or facilitators)</i>	500,000	550,000	600,000	650,000	700,000	750,000	800,000	850,000	900,000
<i>Fundraising in partnership with allies</i>	120,000	140,000	160,000	180,000	200,000	220,000	240,000	260,000	280,000
<i>Business line (consulting services)</i>		50,000	80,000	110,000	140,000	170,000	200,000	230,000	260,000
EXPENSES (in USD)									
Platform development									
<i>Initial investment</i>	1,000,000								
<i>Additional investments (based on feedback)</i>		50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
<i>Operations</i>		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
<i>Maintenance</i>		30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Administrative expenses									
<i>Team salaries</i>	90,000	120,000	150,000	180,000	210,000	240,000	270,000	300,000	330,000
<i>Office expenses</i>	27,000	36,000	45,000	54,000	63,000	72,000	81,000	90,000	99,000
<i>External tech consultants</i>	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
RESULTS (in USD)									
GROSS RESULTS	- 597,000	304,000	365,000	426,000	487,000	548,000	609,000	670,000	731,000

Potential risks

In order to ensure the proper implementation of our proposal, we have identified some potential risks that could jeopardize the success of Sutichay. These risks are listed below:

Table 2. Sutichay’s potential risks

Type of risk	Risk	Description	Mitigation
	People do not want to share their personal information	There may be mistrust regarding the actual use of the information.	Inform through awareness campaigns on social networks, radio, television, and newspapers. Use some techniques based on behavioral science, like offering coupon codes.
Ethical	People misreport themselves as affected by a crisis / disaster	Expecting to receive some kind of aid, individuals might report themselves as affected when they are not.	Request evidence of affectation. Since every registry is associated with an individual's personal information, the platform could notify when an alert of needs is not verified by authorities. When an individual persists in this behaviour, the platform can ban its participation. Other soft coercitive measures could be included, such as physical notifications, or limitations in the access to other public services.
	Misuse of personal information	We work with very confidential information about people's needs.	Individuals will be told that the information will only be used for political intervention purposes in times of crisis. Also, access to such information will only be allowed after signing confidentiality agreements.
	Unaligned expectations	The government's ability to provide assistance may not be what families expect.	Discussion among the stakeholders (mainly authorities and social actors) about which measures would be the most appropriate. Publicly report the action plans prepared for the different types of disasters.
Political	Unaligned political interests	Some politicians may not prioritize strategies such as the one proposed because they respond to their own agendas.	Assign the administration of the platform to entities (public or private) whose institutional objectives include the objectives of the project. Establish a private group to serve as an auditor.
	Political uncertainty	In recent years, Peru has had many political problems that affected the effectiveness of public policy.	Ensure legal autonomy in the use of the platform.

Table 2. Sutichay’s potential risks (continue)

Type of risk	Risk	Description	Mitigation
Operative	Connectivity problems (access)	The low degree of connectivity in some areas of the country may affect the functioning of Sutichay.	Establish agreements and / or contracts with telecommunications providers.
	Disaster-related interruptions on internet services	The crises or disasters may temporarily affect the networks’ infrastructure	Promote temporary solutions (wireless connection) with telecommunications providers.
	Barriers in the use of the platform	Sutichay can be difficult to understand for people in rural areas because they are not familiar with technology given its scarce access.	To promote several information and training campaigns through national and local governments. We also suggest implementing differentiated strategies between rural and urban areas due to the different level of access to technology.
	Vulnerable school infrastructure	The infrastructure of many schools would not withstand a natural disaster.	Joint work between MINEDU and other authorities to reduce the infrastructure gap in the education sector.
	Inadequate attention from schools and / or social actors.	The quality of care that citizens receive from schools and / or social actors may not be as expected.	Establish training plans at all levels. Implement a support center for complaints or doubts regarding the service.

Road map and timeline

i) Stakeholder’s mapping - As part of the initial stage, an exhaustive analysis looking to identify key actors from i) citizenship, ii) facilitators, iii) authorities and iv) social actors will be set in place. This phase will aim to classify them based on their experience and influence, two key variables that will ease the selection of potential allies for Sutichay.

ii) Stakeholder’s engagement strategy - Based on the previous outcome, a results-oriented strategy will be developed. Preparatory and training actions will be carried out looking for Sutichay’s spokespersons to present a strong and attractive pitch during the roadshow.

iii) Early alliances - Based on the interest shown, priority alliances will be offered aiming to seal at least one relevant ally from the citizenship, one facilitator to serve as the financial partner, one current or former authority and one strategic social actor. These will be invited to co-create a joint pilot.

iv) Design - As part of a participative dynamic, key allies will receive operative details of Sutichay, looking forward to identifying a target population and initial goals related mainly to access and use of the platform in non-disaster contexts – among other Key Performance Indicators (KPI).

v) *Non-disaster context pilot* - Sutichay will be launched for the target population previously elected, in a non-disaster context. Findings on access and use will be followed closely to determine if any major change is required.

vi) *Scale up* - After the correspondent adjustments, Sutichay will look for new partners with the aim to scale its reach at a national level, but also, to prepare the required capacity for attending disaster contexts. Both challenges will certainly face larger financial demands. Findings of the non-disaster pilot will be strategically advertised in the media, as a proof point of Sutichay’s potential.

Table 3. Annual planning - Timeline

Road map	Stage	2022											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SET	OCT	NOV	DIC
Stakeholders mapping	i)	█											
Stakeholder’s engagement strategy	ii)												
<i>Preparatory actions</i>		█											
<i>First pitch</i>			█										
<i>Roadshow</i>			█	█									
Early alliances	iii)												
<i>Citizenship</i>					█								
<i>Facilitator</i>					█								
<i>Authority or relevant social actor</i>				█									
Design	iv)												
<i>Targetting and initial goals</i>						█							
<i>Operative and financial model</i>						█	█						
Non-disaster context pilot	v)												
<i>Launching</i>							█						
<i>Constant feedback and adjusts</i>								█	█				
Scale up	vi)												
<i>Launching</i>									█				
<i>Constant feedback and adjusts</i>										█	█	█	█

4. Conclusions

In Peru, poor information systems have undermined the effectiveness of public interventions. This dilemma has been particularly critical in periods of crises or disasters, since it makes it even more difficult for state aid to reach the neediest populations, at the timeliest moment. In order to improve the speed and quality of targeting of policy measures during a disaster or a crisis, we propose Sutichay: a technological solution that facilitates the identification of vulnerability demands from households and their members.

Sutichay is a word from the Andean Quechua language that means “to make visible”. This philosophy is considered core in this project, as the proposed solution will allow every resident in Peru to register its needs in terms of food, clothing, housing and access to basic services (health, transportation, education, among others). Such information will be transmitted in real time to authorities and social actors, so that they can carry out their support actions in a timely manner.

The logistical support of the proposal will be carried out through schools, which will function as assistance centers and collection points for the requested aid. This operative model will be of utmost importance in rural areas of the country, where the scarcity of information and geographic complexity are more critical.

If the appropriate incentives are established, Sutichay will offer a participative solution. In other words, the interaction will not be limited to citizens, authorities and social actors; but will also consider public and private institutions. In order for these agents to actively participate in Sutichay, we propose different incentive schemes. With this, we trust Sutichay will be a relevant initiative for a large number of stakeholders, as well as financially sustainable.

We also estimate the potential covered population by Sutichay and contrasted it with the actual affected population in the last disasters that occurred in Peru. Our analysis reveals that Sutichay could have impactfully contributed during those crises. In detail, through Sutichay and the support of schools nationwide, the proportion of localities that could have received complete essential aid would have been 34.2% after the 2007 Ica earthquake, 84.3% after the 2017 FEN, and 99.9% during the first months of the current COVID-19 pandemic.

Similar to other public policies, the proper development and operations of Sutichay include some risks. These are mostly of ethical, political and operational types. However, the proposal includes a set of actions to mitigate them.

It is important to note that Sutichay offers a cost-efficient solution. Sutichay would not represent a significant increase in public spending, since there are already public policies focused on disaster risk management and care for the vulnerable population. Sutichay would be incorporated as a complement to these public policies and could even improve their quality of spending.

As next steps, we consider working on the final design and implementation of Sutichay during 2022. The first stage will be triggered with an exhaustive stakeholders mapping, accompanied with strategies, to generate commitments out of these. Subsequently, we will prioritize alliances that allow us to start the development of a pilot platform - to identify opportunities for improvement. We will iterate the tuning process to end with the official launch of the digital tool.

Finally, we consider that it is possible to reinforce the impact of Sutichay if the location of other types of establishments is available. We emphasize that such establishments must be (1) easily located by citizens, authorities, and social actors; and (2) located near many citizens. Establishments other than schools that would meet these characteristics could be medical centers, churches, police stations, among others.

5. Bibliography

- Dayton-Johnson, J. (2006), "Natural Disaster and Vulnerability", *OECD Development Centre Policy Briefs*, No. 29, OECD Publishing, Paris. <https://doi.org/10.1787/202670544086>.
- Defensoría del Pueblo. (2020). *Entrega de bonos a hogares en el contexto de la emergencia por la COVID-19: Dificultades y recomendaciones*. Lima.
- Díaz-Cassou, J.; Deza, M. C.; & Moreno, K. (2020). *Perú: Desafíos del Desarrollo en el post COVID-19*. Inter-American Development Bank. Document for Discussion N° IDB-DP-00790.
- ECLAC. (2021, January 25). *In Latin America and the Caribbean: Fragile and Uneven Economic Recovery Expected, Warns New UN Report*. ECLAC. <https://www.cepal.org/en/pressreleases/latin-america-and-caribbean-fragile-and-uneven-economic-recovery-expected-warns-new-un>
- Fowks, J. (2021, June 1). Perú registra la mayor tasa de mortalidad del mundo por la covid. El País. <https://elpais.com/internacional/2021-06-01/peru-eleva-de-68000-a-180000-los-muertos-por-la-pandemia-de-la-covid-19.html>
- INEI. (2019). *Condiciones de vida de la población venezolana que reside en Perú*. Lima.
- INEI. (2020). *Informe técnico Perú: Estimación de la vulnerabilidad económica a la pobreza monetaria. Metodología de cálculo y perfil sociodemográfico*. Lima.
- INEI (2021a). *Producción Nacional. Informe Técnico*. Lima.
- INEI (2021b). *Evolución de la pobreza monetaria 2009 -2020. Informe Técnico*. Lima.
- INDECI. (2009). *Lecciones aprendidas del Sur - Sismo de Pisco, 15 agosto 2007*.
- INDECI. (2017). *Compendio estadístico del INDECI 2017 - Gestión Reactiva*. Lima: Instituto Nacional de Defensa Civil.
- MINSA (2021). *Sala situacional COVID-19 Perú*. https://covid19.minsa.gob.pe/sala_situacional.asp
- Presidencia del Consejo de Ministros. (2021). *Decreto Supremo que aprueba el Reglamento del Decreto Legislativo N° 1412, Decreto Legislativo que aprueba la Ley de Gobierno Digital, y establece disposiciones sobre las condiciones, requisitos y uso de las tecnologías y medios electrónicos en el procedimiento administrativo*. Lima, Peru.
- Reuters. (2021, June 10). Reuters Covid-19 Tracker. <https://graphics.reuters.com/world-coronavirus-tracker-and-maps/regions/latin-america-and-the-caribbean/>
- Superintendency of Banking, Insurance and AFP (SBS) (2020). *Perú: Reporte de Indicadores de Inclusión Financiera de los Sistemas Financiero, de Seguros y de Pensiones. December 2019*. Lima.
- UNICEF. (2020). *COVID-19: Impacto en la pobreza y desigualdad en niñas, niños y adolescentes en el Perú. Estimaciones 2020-2021*. Lima: UNICEF.