

Building Inclusive Risk Management:  
Triggering Change Toward Community Resilience

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# Inclusive Evacuation Protocol for Colonia Palma Sola FOVISSSTE

May 2023

This report is part of the project “Building Inclusive Risk Management: Triggering Change Toward Community Resilience,” a joint initiative between SIA Consultoría para el Desarrollo, the project Catedra Conacyt 469 at the Development Management Center of Universidad Autónoma de Guerrero (CGD-UAGRO), and Instituto Integral para la Gestión Social de Riesgos de Desastres y Cambio Climático A.C. (Integral Institute for the Social Management of Disaster Risks and Climate Change) (IIGSRDYCC). This process and its results were obtained in the framework of the project “Gender-Responsive Resilience and Intersectionality in Practice (GRRIPP) - Networking Plus Partnering for Resilience” funded by the Economic Social Research Council (ESRC) and University College London (UCL), ESRC reference number, XXXX.

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## ● ● ● Foreword

Acapulco, like other cities in Mexico, is vulnerable to natural disasters and climate change. However, most of the actions related to risk management and climate change are thought from the top down, with little or no participation of social actors and without considering the multiple inequalities and diversity of communities. Although civil society is present and active in disaster response processes through solidarity and care networks, there is little social participation in prevention processes and in building long-term resilience. Addressing these gaps will make it possible to generate inclusive and relevant risk management and climate action processes for the diverse actors that form and transform cities, as well as to develop both response and prevention processes.

In order to address these gaps, a research and advocacy process has been carried out since 2017 through a project developed by Celia Ramírez Aguirre in the framework of the Master's Degree in Sustainable Development Management (MGDS) of the Center for Development Management of Universidad Autónoma de Guerrero (CGD-UAGRO), and in collaboration with a group of women from the Palma Sola community in Acapulco for risk and resilience management, considering gender disadvantages and discrimination, which are aggravated by their intersection with other conditions such as poverty, religion, and geography (Ramírez, 2019; Ramírez & Becerril, 2021). The formalization of the women's group into a civil association called Institute for the Social Management of Disaster Risk and Climate Change (IIGSRDyCC) has strengthened the aforementioned project. Likewise, this project has also been strengthened by two academic projects carried out by two members of the IIGSRDyCC, one developed by Dayanna Valente Ramírez in the framework of the MGDS program of the CGD-UAGRO, and the other by Celia Ramírez Aguirre in the framework of the Doctoral Program in Urbanism at Universidad Autónoma del Estado de México <sup>1</sup>.

On the other hand, since 2015, the research and advocacy program "Catedra Conacyt 469 - Public Policies and Innovative Technologies for Civil Protection in Acapulco" has been developed. Within this framework, between 2019 and 2021, the project "Smart Urban Resilience" was developed which generated the roadmap wCivil Society and Urban Resilience through Smart City Interventions." This document shares "10 messages that contextualize the encounter between urban digital technologies and disaster risk reduction (DRR) processes" seeking to "support stakeholders interested in both DRR and information technologies and recognize the potential of digital technologies while critically reflecting on their pros and cons, limitations and gaps, as well as risks and opportunities" (Smart Urban Resilience, 2021).

In order to intertwine the aforementioned research and advocacy work and the efforts of the IIGSGDyCC, the project "Incorporation of a Roadmap for Smart Urban Resilience" funded by the University of Newcastle was implemented. This project focused on a mentoring process for the IIGSGDyCC in Colonia Palma Sola based on the roadmap "Civil Society and Urban Resilience through Smart City Interventions." This process sought to exchange knowledge and explore the potential of using the roadmap, resulting in the identification of three lines of action for the IIGSGDyCC.

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<sup>1</sup> It should be noted that this project and the degree projects (master's and doctoral) are intended to nurture and reinforce each other.



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Based on this convergence, the project **“Building Inclusive Risk Management: Triggering Change Toward Community Resilience”** aimed to deepen the processes described above and contribute to the consolidation of transdisciplinary alliances, capacity building, and the construction of an inclusive risk management strategy that triggers change toward community resilience in Acapulco.

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## Abbreviations

**AGEB** Basic Geostatistical Area

**CONAGUA** National Water Commission

**CONAPO** National Population Council

**CONEVAL** National Council for the Evaluation of Social Development Policy

**INEGI** National Institute of Statistics and Geography

**IIGSRDYCC** Instituto Integral para la Gestión Social de Riesgos de Desastres y Cambio Climático A.C. (Integrated Institute for the Social Management of Disaster Risks and Climate Change)

**SCINCE** Census Information Consultation System

**COFEPRIS** Federal Commission for Protection against Health Risks

# 1. Introduction ●●●

The project “Building Inclusive Risk Management: Triggering Change Toward Community Resilience” was implemented between January and May 2023 in the communities of Palma Sola FOVISSSTE sector and Burócratas in the Acapulco Metropolitan Zone (AMZ). The communities Palma Sola and Burócratas belong to the amphitheater area of Acapulco characterized for being the most “consolidated” and oldest area of the city, due to the concentration of equipment, health, and education services (APDDU, 2015, p. 2-241). However, both neighborhoods are located in the upper part of the amphitheater and are formed by precarious and informal housing and lack public services. According to the National Population Council (CONAPO, 2020), the Palma Sola neighborhood has a high and medium degree of marginalization, while the Burócratas neighborhood has a medium and low degree of marginalization. Regarding the risks, the Palma Sola neighborhood has serious contamination problems, and the population is vulnerable to landslides and landslips in the event of heavy rains or hurricanes (PDDU, 2001, p. 53). On the other hand, Burócratas also has contamination problems due to solid urban waste and water from sewage pipes (García, 2019).

The project’s overall objective was to strengthen community risk management processes and associated capacities from an intersectional perspective that considers the intersection of the various categories of domination, including gender and class, for the creation of urban resilience. To achieve this, the project proposed three lines of action as a result of the 2022 mentoring process: (i) to collaboratively create an inclusive evacuation protocol in case of tropical cyclones or earthquakes in the Palma Sola neighborhood; (ii) to address psychological impacts related to previous disasters that disproportionately affected women who are caregivers through art therapy, providing tools to face future events; and (iii) to explore the scalability of the processes carried out in Palma Sola, reflecting on “infusion” processes in the Burócratas neighborhood, also in Acapulco, and the collaboration with the public sector and academia.

This report describes the methodology and results of the first line of action, **“Create an inclusive evacuation protocol for Colonia Palma Sola FOVISSSTE,”** and concludes by outlining a reflection on its implementation regarding gender-sensitive resilience and intersectionality in policy and practice.

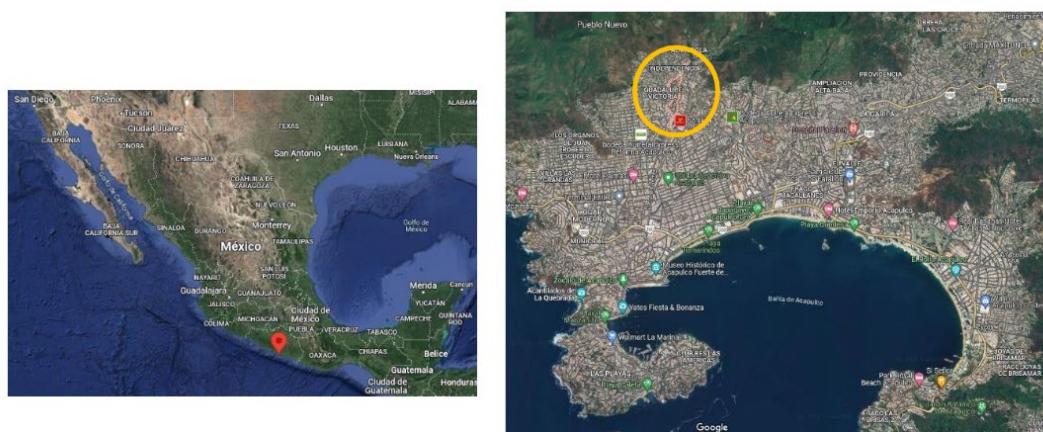


Figure 1. Map of Acapulco and Colonia Palma Sola

## 2. Methodology ●●●

The methodology used for the inclusive evacuation protocol for Colonia Palma Sola was adapted to the needs of the project. It is based on a method for participatory analysis developed by Observatorio del Derecho a la Vivienda, also called CO-MAPP. This methodology is a tool for resilience, empowerment, and information to promote people's rights by doing participatory analysis in communities in Latin America (Vázquez et al., 2017). The main characteristic of the CO-MAPP methodology is that it is a study done by the people living in the community oriented by civil or public organizations on threats, capacities, and vulnerabilities that they face or have, and is complemented with existing official information. It should be emphasized that it is not a risk atlas, but a tool that complements the atlases because it provides more in-depth information on a specific area (Vázquez et al., 2017). This information is also used to apply knowledge and protocols in the event of an emergency in order to safeguard the physical integrity of the population and activate disaster prevention measures.

The relevance of this tool makes it possible to raise awareness and empower a community about the threats to which they are exposed, and it is also inclusive because it considers pregnant women, women, men, young people, children, and people with disabilities.

The method analyzes four variables within the community:



Table 1. Variables of the Co-Mapp Participatory Analysis.  
Source: CO-MAPP Implementation Manual, 2017.

The main users of the methodological proposal were the population of Colonia Palma Sola FOVISSSTE and the IIGSGDyCC, who jointly developed and managed strategies to mitigate the impacts of hydrometeorological events. The implementation of the research was qualitative in nature, which allowed for an in-depth and dynamic analysis in a participatory manner.

### 2.1. Operational Framework

Between February and April 2023, three face-to-face activities, three follow-up meetings, and an online survey via WhatsApp were carried out. The participatory process included different profiles such as women, men, adults, children, people with disabilities and their caregivers. The activities strengthened links and interest for the elaboration of the participatory protocol. The activities were as follows:

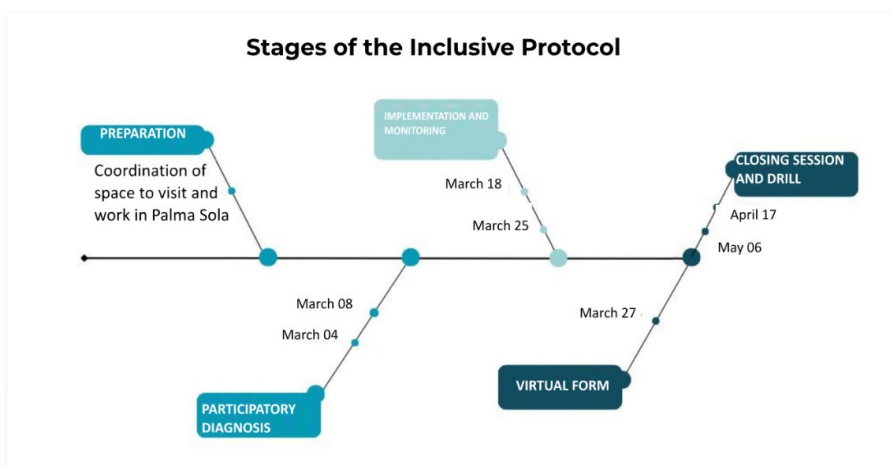
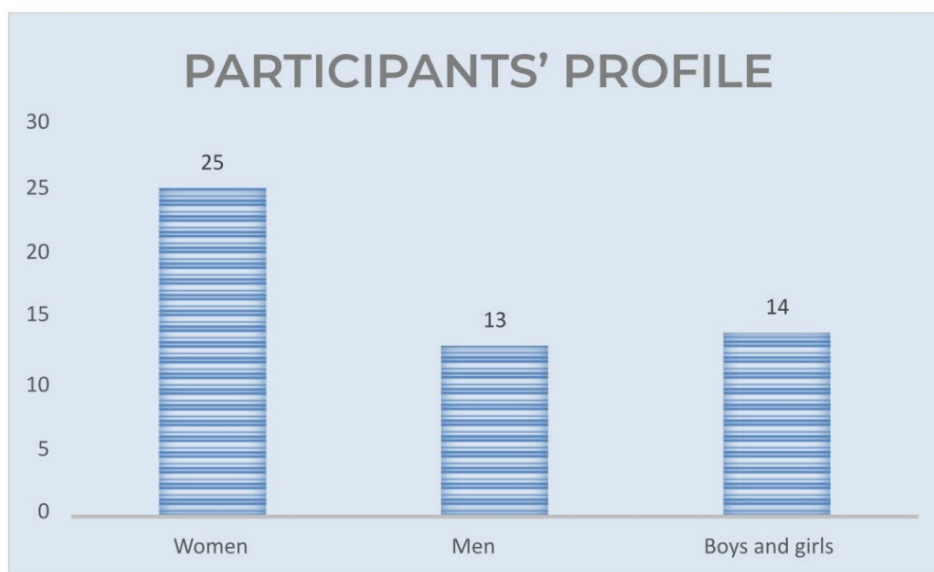


Photo 1. Stages of the Inclusive Protocol Process

The interventions were guided by SIA Desarrollo, members of IIGSRDYCC, the Center for Development Management-UAGro, the technical team specialized in Risk Management, and inhabitants of the neighborhood. The following is a profile of the participants, based on the attendance and participant observation lists:



Graphic 1. Participants' Profile

### 2.1.1. First Visit (March 4, 2023)

On March 4, the first visit was made to the Palma Sol neighborhood, with the participation of seven women and four men. A talk was held with the group of women to learn how they act in an emergency, what authorities intervene, and how they act in the event of a situation as a community. They also shared their personal experiences during past rainy seasons.





Photo 2. Talk with Women.

Afterwards, the participatory tour began, which was led and guided by the women. The starting point was the Capilla del Señor del Calvario chapel, until reaching the bed of the Camarón River and joining the Abasolo walkway. During the tour, the women pointed out the risk areas and expressed some of the problems they have during the rainy season: rain runoff from the hillside and damage to the main access to their homes due to water coming down a ravine during the rainy season. They also showed an area where they remembered the people who died during Hurricane Pauline 1997 and told the technical team where the lifeless bodies were located during that disaster. The women also led the team to the altar with crosses or the monument to the victims that was made to honor and remember those people, which still has traces of candles.





*Photo 3. Participatory Tour.*

Afterwards, we visited the Camarón River and took advantage of the moment to take some photographs with the use of a drone. On the banks of the river, houses bordering the river and close to its bed were observed. This process was enriched with a visit to a house and a talk about how they built their house, which belongs to a family of bakers from another region of the state of Guerrero who argued that they observe how their region of origin is improving in terms of infrastructure and water storage systems, unlike their current home in Palma Sola, where they perceive that the neighborhood fails to improve in terms of utilities.





*Photo 4. Tour Along the Banks of the Camarón River.*

The tour continued along the banks of the Camarón River where there is another type of housing with makeshift houses and plots that have been circled so as not to lose their land. These belong to families of Palma Sola as well, but for safety and fear of the river overflowing during the rainy season, considering what happened with Hurricane Pauline, they only visit the place from time to time, since it is not their residence.

During the tour, the group of women visited another neighbor to invite her to participate, but due to visual and walking limitations, she was unable to join the group; however, she shared her experience during the rainy season and how she acts when an emergency arises as a person with limited mobility.



Photo 5. Talk with Neighbors of Palma Sola.

The tour ended with a visit to the Abasolo walkway. In this space, the women discussed some improvements that could be made to avoid risks and strengthen their resilience. The main proposals made by the women were the following:

**1. Place a handrail on the walkway:** due to the slope of the street, the steps are uneven and as they go up, the difficulty increases. In addition, if people have any health problem, limitation or disability, the risk of falling or getting hurt during the rainy season increases.

**2. Maintenance of street lighting and tree pruning:** regarding street lighting, they consider it important to feel safer when their children are on their way to school and to have better visibility when walking. On the other hand, tree pruning is important to avoid an incident during the rainy season.

The technical team specialized in risk proposed painting the safety step strips to improve the visibility of each step. Regarding the maintenance of street lighting and tree pruning, the team suggested analyzing the feasibility of the proposal. Based on what the women explained during the visit, a training program in basic first aid was proposed where they would be taught to use a marine stretcher to move their patients from the house to their car or vice versa, to organize their own emergency kit, and to use a loudspeaker to transmit information to the community. The combination of proposals from the team and the community was validated that same day and the date for the next visit was agreed upon. Finally, the technical team was left to analyze the feasibility of the street lighting and pruning proposals.





*Photo 6. Tour of the Abasolo Walkway.*

The results identified during the visit were as follows:

### Relevant findings

It was identified that the community has bases of organized DRR activities:

- A word-of-mouth communication network (between neighbors) when an emergency occurs or for summoning people.
- In situations where a person is sick and needs to move from the main street to their home or vice versa, a group of volunteer neighbors help carry the patient. For this purpose, they adapt chairs and together they carry the patient. In the event that a member of the community suffers an accident, the families themselves are responsible for transporting them to a hospital or clinic (in their own cars, cabs, or public service vans) since, due to the distance, emergency services do not reach Palma Sola.
- Local authorities have a temporary shelter set up in a kindergarten; however, for the families living in the upper part, it is not a midpoint and in case of an emergency it takes more time to move around. In addition, based on local knowledge, people argue that they do not feel safe in the temporary shelter because there is a rock mound at the top and they fear it might collapse. To address this situation, the mothers are adapting the Señor Del Calvario chapel to meet for their recreational activities and analyzing if it would be a place where they feel safe if an emergency arises.
- They have emergency backpacks, but there are doubts as to whether they are properly equipped and concerns about how to use them.

### Identified areas of improvement

- Generate a main access route in good condition to respond to an emergency. Some streets that connect the houses present difficulties for people with disabilities, handicaps, or the elderly; however, the slopes are typical of the natural relief of the neighborhood and actions can only be taken to lessen the difficulties.
- Implement the chapel as a gathering point, as there is a temporary shelter assigned by the authorities that is not considered safe. Reasons for choosing the chapel: 1) because it is a midpoint for people who live in the upper part, while getting to the shelter implies more distance, and 2) based on local knowledge they fear that the shelter is not a safe place because of a block of rocks.
- Continue with the appointed group to transfer patients from the main street to their homes or vice versa, having already identified who participates in this task.
- Carry out the actions they identified that can be implemented to feel safe and create safe spaces, which are focused on improvement, i.e., install a handrail, paint, light up, among others.

Table 2. Findings and Areas of Improvement



## 2.1.2. Virtual Meeting (March 8, 2023)

On March 8, a virtual meeting was held with Grupo SIA, the president of IIGSRDYCC, and the Center for Development Management-UAGro, in order to present a summary of the tour, the findings, the areas of improvement, and a budget for implementing the actions. The proposals of street lighting and tree pruning were also discussed again; due to management, time and safety issues, the team decided not to implement them within this project. However, it was agreed to support the community and explain the process and which city government institutions they should contact to carry out these types of procedures. Below are some images of the tree pruning situation. In order to carry out this action, it was necessary to have permission from the municipal ecology and civil protection department. Also, to independently perform this action was a risk for the person performing the pruning because of the electric wires and water hoses (it is the way to distribute water in the community). On the other hand, for the maintenance of street lighting, it was recommended that the Street Lighting Department change the bulbs. The president of IIGSRDYCC discussed this with the community and explained that they could do it later with the support of the Institute.



*Photo 7. Tour through the Streets of the Neighborhood.*

Finally, the meeting validated the lines of action for implementing adaptation, equipment, and training actions with the community.

### 2.1.3. Second Visit (March 18, 2023)

On March 17, IIGSRDYCC took the initiative to form a community committee with the neighbors of Palma Sola with two specific objectives: the first was to receive the corresponding material and to be responsible for the lines of action derived from the protocol, while the second was to encourage them to implement other functions related to risk reduction in the future. The committee also promoted cleaning tasks in the Abasolo walkway before implementing the actions.



Photo 8. Inauguration of the Community Committee. Source: Ramírez, 2023.

The objective of the visit on March 18 was to implement the lines of action of the evacuation protocol in a participatory manner. Additionally, IIGSRDYCC led a dynamic activity for children with games that addressed the theme of “Riesgolandia”<sup>2</sup>. The purpose of the visit was to promote knowledge about DRR in the community. Moreover, an important objective was for women to focus on and participate in the activities related to the protocol, so that later the children could be integrated into the rehabilitation activities. During the process, 14 girls and boys, 13 men, and 23 women participated at different times during the process.

<sup>2</sup> *Riesgolandia* is an educational game on disaster prevention. It includes several educational messages that help to understand which are the good practices that can reduce the impact of disasters, and which are the bad practices that can increase vulnerability. The game follows a snake-shaped path through an attractive landscape with educational details (UNISDR, n.d.).





Photo 9. Group of Boys and Girls playing "Riesgolandia".

The activities were divided into four groups related to the improvement of spaces and the strengthening of resilience and local capacities. The topics were decided based on the results of the first visit and a participatory validation process:

### **Communication**

A megaphone was delivered to the women so they could pass the message from person to person or from house to house in order to transmit information. In the event of an emergency, technology tends to fail and having this tool allows them to communicate from a safe point so that everyone gets the message.

### **Equipment**

The community committee formally received supplies for an emergency first aid kit and a marine stretcher so that they can safely transport and carry a person in the event of an accident. In addition, they participated in a practice session on the handling and use of the stretcher. The activity was carried out with both women and men.



Photo 10. Delivery of Material to the Committee

## Training

The training was conducted by two paramedics (male and female) who are specialists in emergency care. During the session, topics related to everyday accidents were explained. In addition, the men and women shared their experiences related to emergency situations, where the paramedics emphasized the importance of distinguishing between an emergency and an urgency, knowing the emergency numbers and how to act as first responders, and learning how to use the 911 number. The training concluded with a practice session for them to learn how to use the marine stretcher to transfer their patients. A group of women and a group of men were formed, and an accident was simulated for each group to carry the patient with the stretcher.

An unexpected result was that days later a real event occurred in which a woman suffered a fall and for the first time they used the stretcher, which proved to be very useful. There is no photographic evidence of this event, but we have the statement of the president of IIGSRDYCC, who was informed by the neighbors.





Photo 11. Practice in the Use of the Stretcher by Women.



Photo 12. Practice in the Use of the Stretcher by Men.

## Infrastructure improvements

As part of the improvement, the Abasolo walkway in the Palma Sola neighborhood was rehabilitated with the installation of a handrail, the restoration of a ramp, and painting of some stairs (safety step strips). Since the street has a steep slope and the steps are uneven, this activity was very important because it will allow visually impaired people to distinguish the steps. Also, they will be safer for people with limited mobility or who use a cane, while women who carry their groceries will be able to use the handrail and feel safe when walking. This activity in particular was a very pleasant experience that highlighted the roles among the families: while the parents participated in the first aid training, the children and young people joined in painting and led this process.



Photo 13. Safety Step Strips.



*Photo 14. Work Led by Young People and Children.*

A ramp was also rehabilitated, which in times of rain was extremely dangerous because it was smooth, and the inhabitants already had a record of accidents due to falls. The rehabilitation process consisted of placing small concrete grooves to prevent falls in that area.



The results of the activities implemented during the second visit were as follows:

### Relevant findings

It was identified that the community has bases of organized DRR activities:

#### Emergencies

- When people call an emergency number, they are nervous and do not give correct references (address and exact location). The emergency units take longer because the city is large and there are streets with the same name in different neighborhoods.
- The use of the 9-1-1 emergency number is present in the community; however, the knowledge of how to use it and how to indicate the references correctly needs to be reinforced and transmitted to all members of the family.
- At the municipal level, the emergency response units are civil protection, firefighters, and the red cross. The command centers are located in remote areas, so their response time is approximately 1 hour and, in some cases, longer.
- There is a perception that the emergency units that provide service in the municipality are deficient for the number of inhabitants.
- Lack of command centers and emergency response centers at midpoint or strategic points to quickly serve the municipality.
- There are private ambulance services that are not regulated and are not certified by the Federal Commission for Protection against Health Risks (COFEPRIS). The only company in Acapulco that is certified is Ambulancias Internacionales.
- The socioeconomic conditions of the inhabitants are favorable for them to transport their patients themselves: the cost of a private ambulance is at least \$2,000.00 pesos. The price increases if the patient requires oxygen or medical assistance, or if he/she is in a serious condition.
- Lack of coordination between the different health services—between health centers and the general hospital.
- With the change of location of the general hospital, which was previously located on Ruiz Cortines Avenue and is now located in the San Agustín sector at the exit of Acapulco (El Quemado), the transfer time increased from 15 minutes to between 26 minutes and an hour depending on traffic.

#### Identified areas of improvement

- Generate a solid group of neighbors, who also assign roles among the family to participate. Consider the population of young people and children in the activities since they participate actively.
- Strengthen participation processes and expand them to new sites in the neighborhood (to avoid processes or feelings of exclusion).
- To take advantage of the fact that women are involved and committed to household chores and childcare, and that they are also involved in government support management processes and in the improvement of the space where they live.
- Take into account that there is a high participation of women dedicated to the household and commerce.

### Identified areas of improvement

- Consider that there is interest in learning on the part of women, men, boys, and girls, since there are incidents that affect them in their daily lives.
- The community already has knowledge about risk and prevention; however, it is important to reinforce it with the support of trained personnel.
- People identify that the time and capacity of the municipality to respond to an emergency is little; therefore, they have alternatives and act as first responders in first aid, both men and women.

Table 3. Findings and Areas of Improvement.

#### 2.1.4. Follow-up Visit (March 25, 2023)

On March 25, IIGSRDYCC made a visit to Palma Sola to continue the rehabilitation work: painting stairs, supervision of the handrail, and restoration of the ramp. This activity allowed the team to ensure that the work was carried out in good conditions and conclude the pending rehabilitation work. In addition, the space was used to hand out information leaflets to the neighbors, extending the invitation to participate in the project activities. Nine women and eight men participated in the event.



Photo 15. Follow-up of Stair Painting and Ramp Restoration. Source: Ramirez, 2023.



Photo 16. Rehabilitation of Abasolo Walkway. Source: Ramirez, 2023.

The generation of the participatory and inclusive protocol along with the community—considering men, women, young people, people with disabilities, people with limited mobility, the elderly, and neurodivergent people—was carried out in two phases, one of identification<sup>3</sup> and the other of implementation<sup>4</sup>. The four lines of action were validated and executed in Abasolo walkway, Palma Sola FOVISSSTE.

This collaborative process sought to empower and promote the community's commitment through concrete actions for the improvement of spaces and training that allow the community to increase its resilience and strengthen its capacities in Disaster Risk Management. As shown in the following table, this is the expected impact.

<sup>3</sup> First visit on March 08, 2023.

<sup>4</sup> Second visit on March 18, 2023.

Action	Identified risk and adaptation	Expected impact
<p><b>Communication</b></p>	<p>In any risk situation, information is passed directly among people, and the women are the ones who carry out this task, moving from one house to another to get a message across.</p>	<p><b>Emergencies</b></p> <ul style="list-style-type: none"> <li>• Effective auditory device to transmit a message to community members; it is easy to use and transport.</li> <li>• Ideal if digital technologies fail.</li> <li>• Allow women to deliver a message from a safe place.</li> <li>• People with limited mobility can use them.</li> </ul>
<p><b>Adapting infrastructure</b></p>	<p>Women, people with disabilities, and the elderly identified the difficulty of getting to some high areas of the neighborhood due to the slope, uneven steps, and a ramp in poor condition, which have caused accidents. The place becomes extremely dangerous during the rainy season.</p>	<p><b>Installation of handrail</b></p> <ul style="list-style-type: none"> <li>• Mitigate falls.</li> <li>• Provide greater safety when walking. Support people who use canes or have any mobility problems (knee problems).</li> <li>• Women can especially use it when going downstairs or upstairs carrying household supplies.</li> <li>• Boys and girls can use it to avoid falling.</li> </ul> <p><b>Safety step strips</b></p> <ul style="list-style-type: none"> <li>• For people with disabilities, they will help them to distinguish each step.</li> <li>• Provide confidence.</li> <li>• At night, each step can be identified.</li> </ul> <p><b>Ramp restoration</b></p> <ul style="list-style-type: none"> <li>• Prevent falls.</li> <li>• Avoid slips during the rainy season.</li> <li>• For people with limited mobility and the elderly, it enables them to walk more safely.</li> </ul>
<p><b>Equipment</b></p>	<p>So far, the community is used to transporting the sick or injured in Acapulco style chairs or armchairs (local name). With the support of neighbors, they transfer them to a vehicle or their homes. This is more difficult due to the weight of the armchair and the difficulties of the slope.</p>	<p><b>Folding marine stretcher</b></p> <ul style="list-style-type: none"> <li>• Increased safety for patient transfer.</li> <li>• Prevents future muscle injuries for people who carry the patient (e.g., back pain, hernias, muscle pain).</li> <li>• A folding stretcher takes up little space and is easy to transport.</li> <li>• Allows direct transfer to the ambulance without the need for further maneuvering.</li> <li>• Increased knowledge of how to transport a patient.</li> </ul>



<p><b>Training</b></p>	<p>The community acts as a first responder. This task is often carried out by the women in charge of the household. There is a need for ongoing training.</p>	<p><b>Basic first aid training</b></p> <ul style="list-style-type: none"> <li>• Strengthen their capabilities to act as first responders.</li> <li>• Increase the confidence of caregivers or persons responsible for people with disabilities.</li> <li>• Confidence in women to attend an accident in the home.</li> <li>• Empower and engage the community and have basic elements to deal with emergencies.</li> <li>• Assist everyday accidents that do not require medical attention (e.g. scrapes, cuts, etc.).</li> </ul>
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Table 4. Implementation of Actions

### 2.1.5. Diagnostic Form (March 27, 2023)

On March 27, a virtual form was sent with the objective of providing knowledge to search for areas of opportunity to improve the accuracy of the evacuation protocol so that it meets the needs of people or caregivers of people with disabilities or limited mobility, or neurodivergent people.

In order to broaden the inclusive vision for people with disabilities, with limited mobility, or neurodivergent people, a survey was conducted among families in Colonia Palma Sola. All the responses received were completed by caregivers or guardians. See Appendix 7.2 for details.

With the analysis of the responses, it was verified that the concerns were addressed in the protocol. In the case of a hurricane or flood evacuation for families, there are two complications: a) challenges related to the people's profiles, and b) infrastructure.

**a) Regarding people's profiles** (with disabilities, limitations, or neurodivergent), the challenges were related to how to stay calm, the fact that children are afraid when they are out of their environment, how to understand the indications, communication, and how the noise of the rain alters people. These issues are complex to understand in a short time and are specific to the condition, so it was decided to include a section in the action protocol that addresses a series of tips on how to act during an emergency, hoping that they will be useful for caregivers of people with disabilities or limitations, or neurodivergent people.

**b) Regarding infrastructure**, most of the concerns were addressed. Some of the comments in relation to infrastructure were that the condition of the streets and stairways limit mobility possibilities. On the other hand, when asked what would be useful to know or learn in the event of a hurricane, flood, or torrential rain evacuation, people mentioned the following: to carry out drills, to know emergency

routes, communication, medical attention, nearby meeting and information points. These topics were addressed, but it is important to highlight the importance of replicating these types of actions in other areas of Colonia Palma Sola.

In this regard, four lines of action were implemented: communication, infrastructure adaptation, equipment, and training to meet the needs of this vulnerable group and their caregivers or guardians. The participatory and inclusive action protocol also addressed the need to know the emergency routes, temporary shelters, additional meeting points, and emergency numbers. It is important to consider that many people do not carry out any prepared actions to evacuate safely, while 23% have some evacuation actions prepared. Finally, only 1% are aware of Civil Protection guidelines and have knowledge of additional training.

Finally, this process finished with the implementation of a drill in the colony in collaboration with the technical risk team, the community of Palma Sola, A.C. IIGSRDYCC and Municipal Civil Protection, with the purpose of reinforcing their local knowledge and resilience and ensure that they have all the necessary elements. Due to insecurity issues in Colonia Palma Sola, it was not possible to carry out the activity in person, so it was decided to present the protocol drill virtually.

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### 2.1.6. Virtual Meeting (April 17, 2023)

At this meeting, the progress made related to the second visit and the follow-up visit was presented to Grupo SIA, the president of IIGSRDYCC and Center for Development Management-UAGro. The first draft of the protocol was also presented. A proposal that was approved during the meeting was to distribute the “Inclusive Evacuation Protocol for Colonia Palma Sola FOVISSSTE” generated in this process among the community; this document had 16 pages for an easy and specific understanding of what to do in case of a meteorological event in the community.

Finally, it was agreed to invite Municipal Civil Protection for the closing event and specific tasks were assigned to assist in the organization and logistics of the event.

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### 2.1.7. Closing and Drill (May 6, 2023)

For the closing event of the inclusive protocol action line, the plan was to implement a drill with the support of Municipal Civil Protection. However, on May 5, IIGSRDYCC informed the team that, due to the insecurity in Palma Sola, the on-site event was cancelled. Since the drill was not carried out in person, the material that would be used in this activity was delivered to IIGSRDYCC by mail: a tarp for the meeting point and two booklets with the inclusive protocol. It was reiterated that the communication channels remained open so that IIGSRDYCC or someone else could resume the activity.

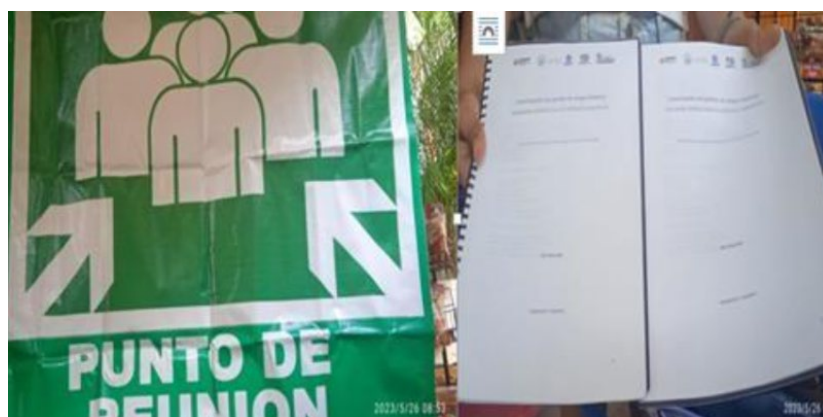


Photo 17. Delivery of Material

This section presented the operational framework, which is based on a participatory process in collaboration with the community of Palma Sola and the technical team specialized in risks, which resulted in the information above. This is followed by section three, which contains information generated to address the technical part of the protocol and consists of two main parts: i) characterization and report of disaster events in Palma Sola, and ii) an analysis of risk due to hydrometeorological events.

### 3. Characterization of Palma Sola Acapulco ● ● ●

The AMZ is located in the south of the State of Guerrero, Mexico. It borders the Pacific coast and is made up of the cities of Coyuca de Benítez and Acapulco de Juárez. The AMZ is the largest and most important urban center in the state (Resiliencia Urbana, 2020). In 2010 it had a total population of 863,431 while the number of inhabitants decreased slightly to 852,622 by 2020 (INEGI).

The territory is divided into seven sectors: Anfiteatro, Renacimiento-Zapata, Pie de la Cuesta, Cayaco- Llano Largo, Diamante, and two rural sectors—Tres Palos and San Agustín (APDDU, 2012-2015). These areas have multiple contrasts in housing, infrastructure, and services. For example, the coastal strip concentrates services and spaces that are specially designed for tourism, and, on the other hand, the periphery has precarious settlements and a lack of public services.

The Palma Sola neighborhood belongs to the Anfiteatro sector, characterized by being the most solid and oldest area of the city due to the concentration of equipment, health, and education services. The main avenues of the city reach this sector (APDDU, 2015, p. 2-241). Locals locally divide the neighborhood into two zones: Palma Sola FOVISSTE and Palma Sola Santa Cruz.

Palma Sola is located in the upper part of the city (north) and borders the slopes of El Veladero National Park. This settlement is characterized by precarious self-built housing, lack of public services, and pollution of different types that impact the ecosystem and the inhabitants themselves (APDDU, 2015, pp. 2-249).

The neighborhood has undergone a process related to land ownership titles, because in the beginning the properties were irregular since they were within the protected natural area El Veladero. However, it was one of the first 54 communities that were reincorporated from the park and for this reason the land use changed. In 2014, during the government of Ángel Aguirre and as part of the “Escrituración Gratuita” (Free Property Deeds) program, deeds were given to the families settled in El Veladero Park (Third Government Report, 2014). In 2022, the government under Evelyn Salgado issued deeds for more than 73 settlements located in Acapulco, including Colonia Palma Sola FOVISSTE (Government of the State of Guerrero, 2022).

On the other hand, Palma Sola has an archaeological area that was a ceremonial center of ancient settlers (800 B.C.-750). It has 18 petroglyphs that were made on an extremely hard stone, at a time when metal was unknown, in which human figures and mythical, geographical, lineage, agricultural cults, and time measurement themes predominate (INAH, 2023).

In 2017, a research process was initiated between the Center for Development Management of Universidad Autónoma de Guerrero (UAGro) and a group of women from the Palma Sola neighborhood in Acapulco regarding risk management and resilience, considering gender disadvantages and discrimination aggravated by their intersection with other conditions such as poverty, religion, and geography. Such work was strengthened in 2020 with the formalization of the women’s group into a civil association called “Instituto para la Gestión Social del Riesgo de Desastre y Cambio Climático” (Institute for the Social Management of Disaster Risk and Climate Change) (IIGSGDyCC).

### 3.1. Report of Disaster Events - Hurricane Pauline 1997

In 1997, on October 5, the first reports of Tropical Depression Nineteen were registered, located 400 km south of the coast of Oaxaca. One day later, the depression evolved into tropical storm “Paulina” southwest of Tapachula, Chiapas. On October 7, it evolved into a category 4 hurricane (extremely dangerous) southeast of Salinas Cruz, Oaxaca. On October 9, it decreased its intensity to a category 2 hurricane, still considered highly destructive, northwest of Tecpan de Galenas, Guerrero (Matías, 1998).

In Acapulco, rainfall with excess humidity had been recorded since October 2, but it was on the night of October 8 and in the early morning of October 9 when the heaviest rainfall was recorded in Acapulco. Paulina’s rainfall was unusual and it caused a disaster due to other factors as well. In only 5 hours, the National Water Commission (CNA) registered a rainfall of more than 400 mm, equivalent to one third of the average monthly rainfall in Acapulco (Toscana, 2003).

The port of Acapulco is characterized by its mountain ranges, which form an amphitheater open to the Pacific Ocean, which prevented Hurricane Pauline from moving inland; the precipitation occurred over the mountains. The land became flooded with water and rivers rose, resulting in landslides and falling blocks. The mixture of water, sand, garbage, trees, and rocks produced mudflows through the natural channels from the upper part to the lower area (Toscana, 2003).

Paulina’s impact on different sectors was severe. For instance, it destroyed urban equipment on beaches, left a large number of people without electricity and drinking water, fishing activities were interrupted, boats were stranded and destroyed, and damage was caused to education and health services, as well as the environment. The worst scenario was the human losses: 207 people died, 200 disappeared, and 52,000 lost their homes (Matías, 1998).

As mentioned by Toscana (2003), the main damages were due to poor urban planning that gave rise to settlements on hillsides near riverbeds and houses located in ravines, in addition to the lack of an effective drainage system. In that year, Manuel Añorve Baños was responsible for managing the emergency as the Municipal President of Acapulco and Ángel Aguirre Rivero as Governor. The most damaged neighborhoods were El Coloso, El Mirador, Simón Bolívar, Tres Palos, Renacimiento, Mozimba, La Progreso, Vista Hermosa, Unidad FOVISSSTE, among others. On the main avenues Cuauhtémoc and Costera Miguel Alemán, debris, mud from the upper part, and sand from the sea accumulated.

The Palma Sola neighborhood is located in the mountainous area and has two main water bodies: the Camaron River that flows into the bay and the Zapotillo River. Since it has human settlements near the rivers, it was not exempt from the damage caused by Paulina and was one of the neighborhoods most affected by the overflowing of the Camaron River. “There were landslides, huge trees uprooted, 120 houses swept away by the current of water carrying mud and stones. In addition to this, the current increased due to the destruction of the old Palma Sola dam, and thirty-six to forty-six deaths were counted in that small territory” (Martínez, 2016, p. 3, quoted by Ramírez, 2019).

Despite the passage of time, traces and memorials are still found in the memory of people as noted by the author Ramirez (2019) in her research work in which she gives reports some statements:

*“I have been living on Zapotillo Street for 25 years; when Hurricane Pauline happened, I was pregnant, I had my 2 children, the first 2 were grown, we fell asleep. It was drizzling when we went to sleep, we woke up with the sound of the rain, and we realized, it was already clear where my neighbors lived, we started to shout to the other neighbors upstairs, and they started to search. They found the first bodies of the 2 children and... then they found a little girl still alive. I felt very sad to have lost my neighbors, I saw my neighbors one day before and the next day I didn't see them anymore, I felt depressed, I didn't even know what to do”. Mrs. Lazara, inhabitant of Colonia Palma (Ramírez, 2019, p. 53).*



There are also traces in the territory as shown in the following image, a memorial that pays tribute to the victims of Hurricane Pauline in the Palma Sola neighborhood and that will remain in the memory of the people who lived through that tragic experience and for the next generations.



Photo 18. Memorial to Those who Died in Hurricane Pauline 1997.

### 3.2. Risk Analysis for Hydrometeorological Events, Palma Sola

Risk analysis based on mapping is a tool that allows us to assess and establish zones using criteria such as slopes, hydrology, rock type, soil type, vegetation, precipitation, population, among others. The combination of multiple criteria makes it possible to obtain information on the levels of hazard, vulnerability, and exposure. Once the information is analyzed and detailed, it is possible to create a map; this allows us to know the risk zones in detail, and plan and avoid damages to the population (Corral et al., 2021).

Below are seven maps of the Palma Sola neighborhood, which is made up of two basic geostatistical areas (AGEB) and were classified as follows according to their main characteristics:

**a 14395:** It has a smaller territory and a population of 450 inhabitants, with a large population of young people, girls, and boys. There are 30 inhabitants with some type of disability; the age group between 15 and 59 years old is usually the one that suffers the most due to disabilities, specifically visual disability. Its social backwardness is high.

**b 14130:** It has a larger land area; therefore, it has a larger population (1985 people), which is characterized by young adults between 24 and 44 years old. There are 124 people with some type of disability, the majority of whom are 60 years of age and older; specifically, the female population is the one that suffers the most due to disabilities. The most frequent disability is difficulty walking and climbing or descending stairs. They have medium social backwardness.

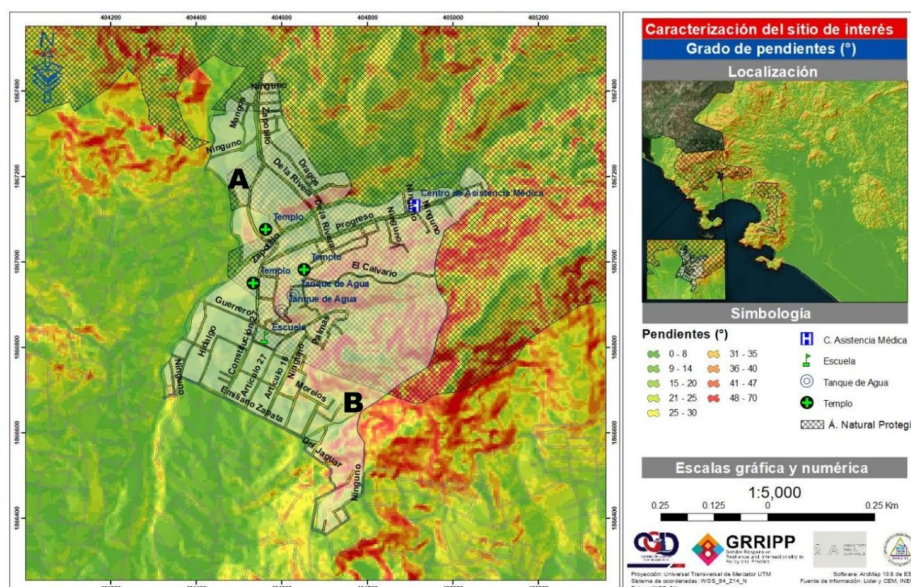
The purpose of this classification is to have a proper understanding of the maps and the context of the territory. In general, all the maps on the upper right side have a macro location of Acapulco and, more broadly, a micro location of the neighborhood. Finally, two specific maps of vulnerability to landslides and landslides are presented, which show the distribution of the population with some type of

disability, so that in the near future the information may be useful for planning actions to assist people within these groups in a more specific way.

### 3.2.1. Terrain Slopes

Colonia Palma Sola is located within the physiographic region 12 Sierra Madre del Sur and the physiographic subprovince Costas del Sur. Its characteristic relief is mountainous, due to the steepness of the slopes as shown in Map 1.

The degree of slope is mainly concentrated in the northeast (NE), east (E), and southeast (SE) ends, as shown in the map with the red marks, starting from the two water tanks and the Señor Del Calvario chapel (temple), andador Abasolo, and areas of the upper part that belong to AGEB 14130. On the other hand, in Map 1 the slopes are slightly inclined towards the west (W) and southwest (SW) and are part of AGEB 14389.



Map 1. Slopes.  
Own elaboration, 2023, based on INEGI, S/N

In the picture, the slope of the Abasolo walkway in the neighborhood is shown as an example.





Photo 19. Slope on the Abasolo Walkway.

### 3.2.2. Hydrology

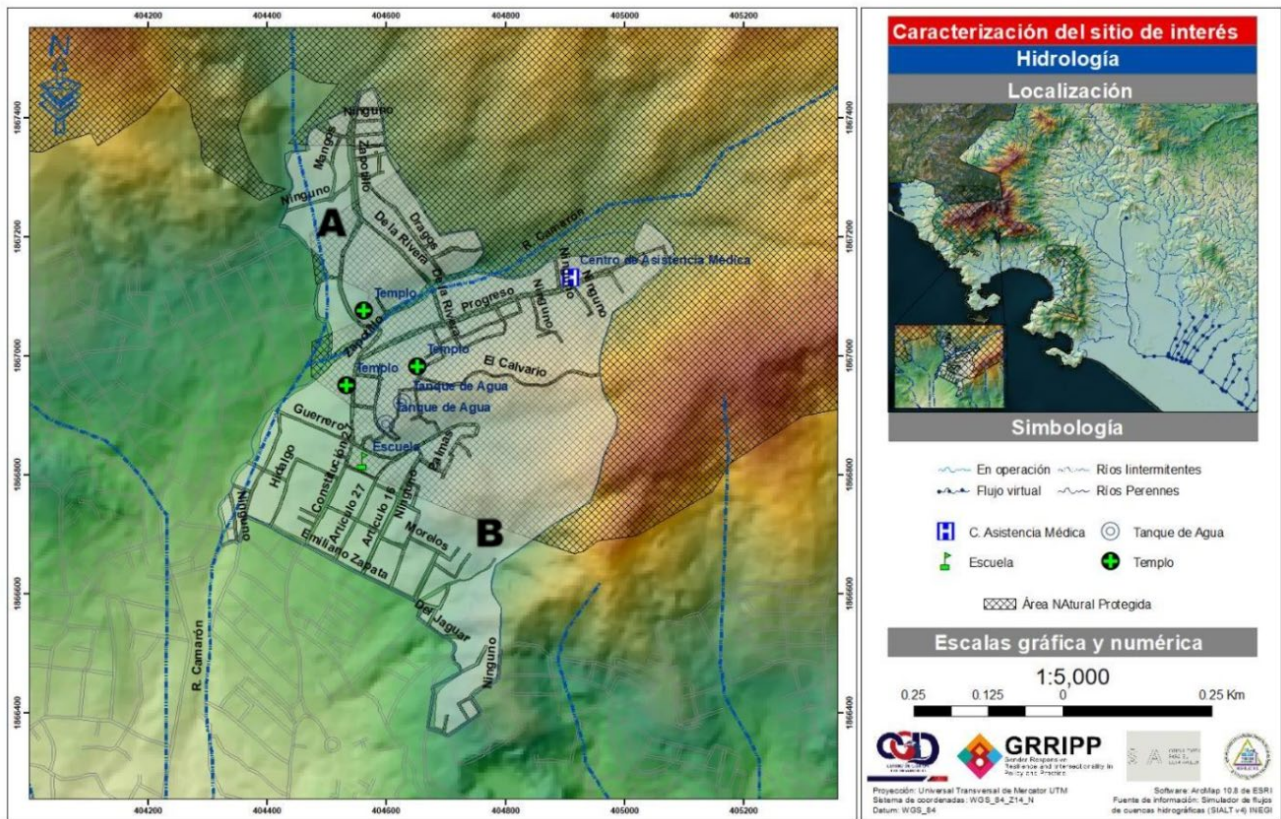
The city of Acapulco has the following watersheds: Papagayo River 1, Papagayo River 2, Papagayo River 3, Papagayo River 4, La Sabana River 1 and 2, Cortés River, Coyuca River, and Coyuca Lagoon; Palma Sola is located in the latter (CONAGUA, 2020).

The main runoffs or water flows that cross through the Palma Sola neighborhood are two: 1) on the A side, west (W), the Camaron River goes down in a north-south (N-S) direction, while on the A and B side, east (E), we find the Zapotillo River that crosses the study area in a northeast-southwest (NE-SW) direction, until it joins the west (W) side of the neighborhood, to continue descending towards the southern (S) part of the bay (Map 2).

The Camarón and Zapotillo rivers are intermittent, which means that the water flows at certain times (due to rain) and the riverbeds remain dry in other seasons or have streams with stagnant water.

The riverbed of Camarón River flows naturally and runs into the sea (Hornos beach); however, it has serious contamination problems due to the lack of drainage in the upper part of the neighborhood. In addition, the inhabitants settled in the riverbed use the water for domestic needs (Dimas et al., 2020, p. 217).





Map 2. Hydrology.  
Own elaboration, 2023, based on INEGI, S/N

The image reflects the situation where the Camaron River flows and its proximity to the houses.



Photo 20. Camaron River Bed.

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### 3.2.3. Risk and Vulnerability due to Landslips

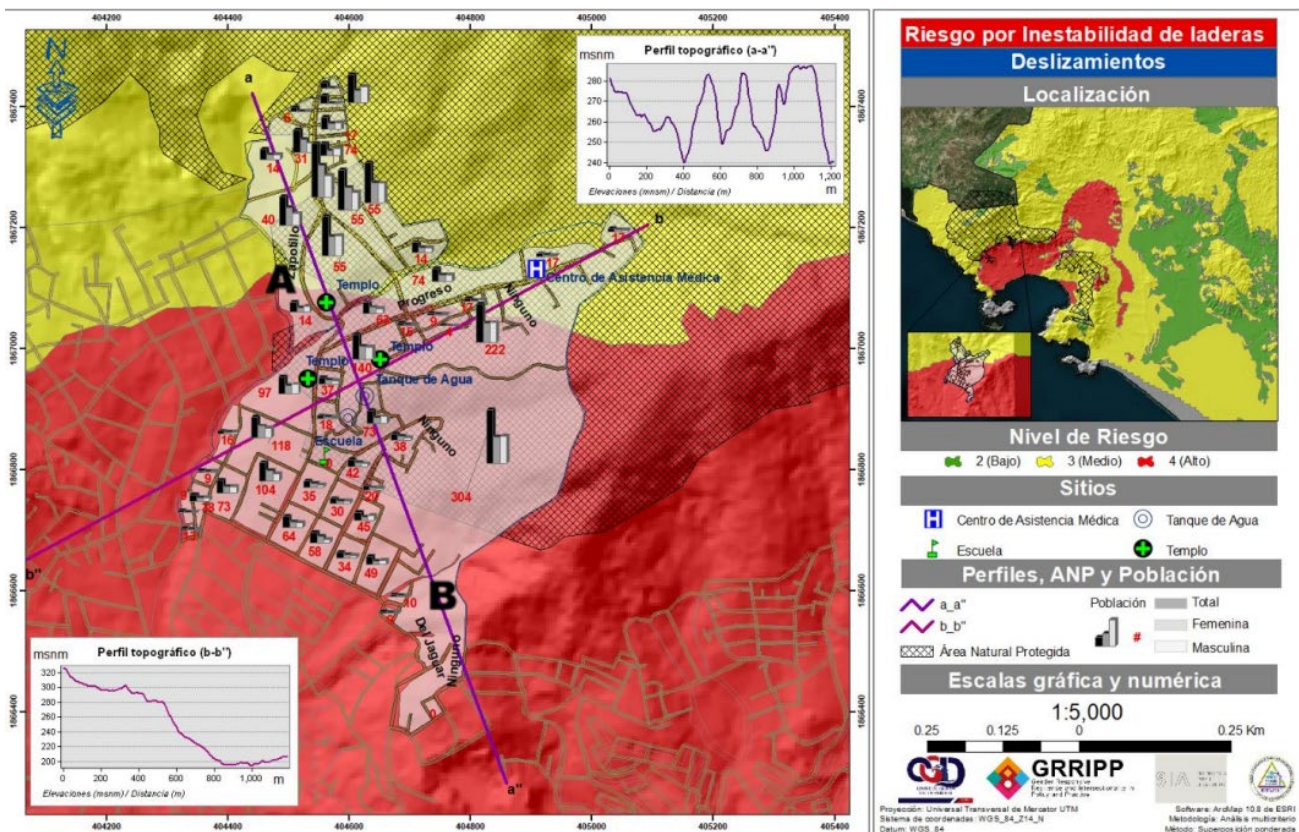
For the landslip risk analysis, a multicriteria analysis was performed, considering rock type (geology), soil types, land use and vegetation, altitude, and terrain slopes (in that order of importance). In addition, the average annual precipitation of the study area was considered to obtain preliminary information about hazards and the degree of physical vulnerability based on urban settlements and communication routes. Finally, as a result of the above, Map 3 of risk and vulnerability was obtained. The most relevant aspects are described below:

- At the municipal level, low, intermediate, and high-risk values were recorded.
- At the local level, in the Palma Sola neighborhood there is an intermediate risk of landslips<sup>5</sup> in the northern part (A), and only a minimal area presents a high risk (Zapotillo).
- On the other hand, human settlements located in the upper part, due to streams and runoffs, are vulnerable to landslides in the event of heavy rains or hurricanes.
- Map 3 shows the total population distribution of Palma Sola, which has 2,435 people with 1,175 men and 1,260 women (INEGI, 2020).

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<sup>5</sup> Landslips: These are movements of rock blocks that move down a slope; they can occur quickly or slowly, and during their movement, cracks and sinking of the terrain occur (CENAPRED, 2021).





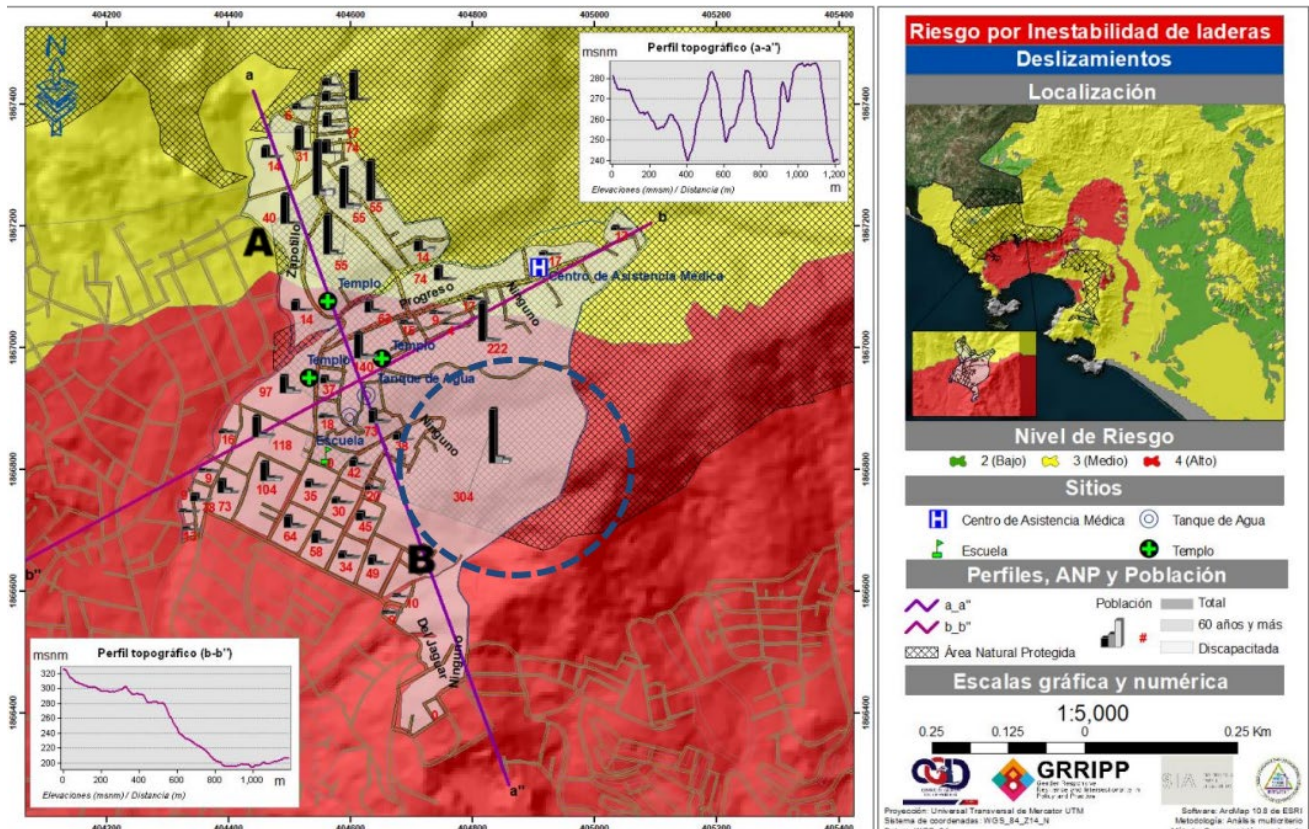
Map 3. Landslide Hazards with Total Population.  
Own elaboration, 2023, based on INEGI, S/N

Regarding the area with the highest degree of vulnerability, the area in blue is where the largest number of population is concentrated, where 304 people (within the area of the Señor Del Calvario chapel) and 222 people live.

On the other hand, Map 4 shows the distribution of the most vulnerable population considering people with some type of disability, which is 154 inhabitants. The population with more disabilities is 60 years of age and older.

The 60 and over age group includes 325 people, 147 men, and 178 women, distributed in the neighborhood.





Map 4. Map of Landslide Risks and Distribution of Population with Disabilities and over 60 Years Old.  
Own elaboration, 2023, based on INEGI, S/N

In the photo, there is an example where a landslide may occur in the event of a heavy rainfall. The photograph corresponds to zone (A).



Photo 21. Risk due to a Landslip.

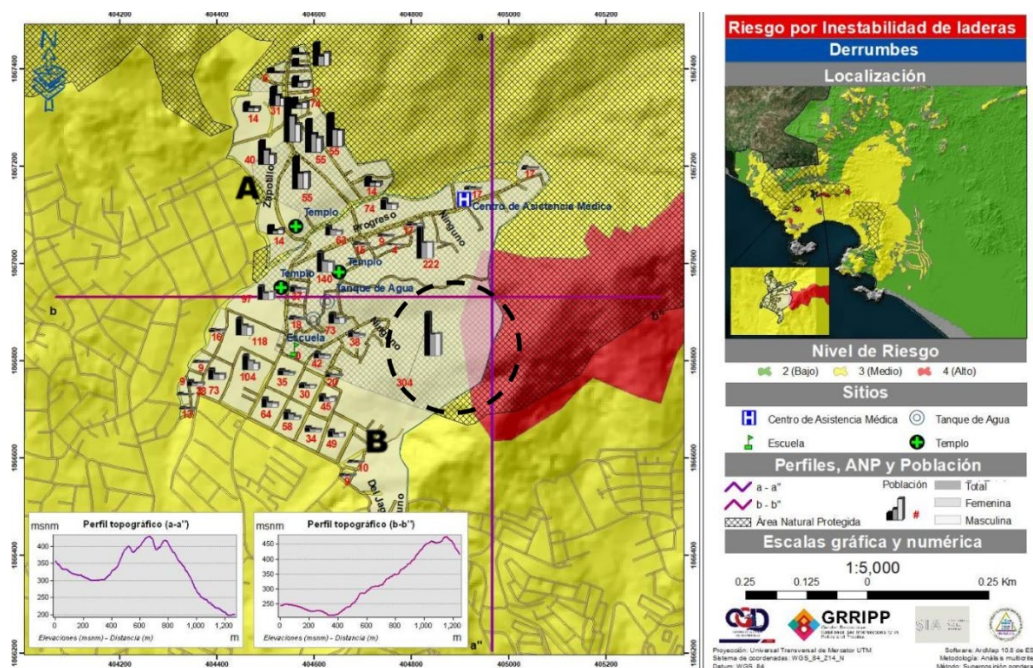


### 3.2.4. Risk and Vulnerability due to Landslides

For the landslide risk analysis, exactly the same criteria were used as for landslips; a multi-criteria analysis was carried out considering rock type (geology), soil types, land use and vegetation, altitude, and terrain slopes (in that order of importance). In addition, the average annual precipitation of the study area was considered to obtain preliminary information about hazards and the degree of physical vulnerability based on urban settlements and communication routes. As a result of the above, information about risk and vulnerability was obtained.

The following is a description of the most relevant aspects:

- At the municipal level, the risk of landslides <sup>6</sup> is low (green), medium (yellow), and high (red). As shown in the upper right part of the map, a large part of the urban area presents medium risk.
- At the local level, Colonia Palma Sola presents a medium risk of landslides. It should be noted that houses located in high areas, due to streams and runoffs, are vulnerable to landslides in the event of heavy rains or hurricanes.
- However, the eastern (E) end of the neighborhood presents a high risk due to the occurrence of falling blocks of unstable rock due to the excess of water in the soil and subsoil. This represents a risk to the population, marked with a circle on maps 5 and 6, zone B, where the largest population is located based on the INEGI 2020 census.



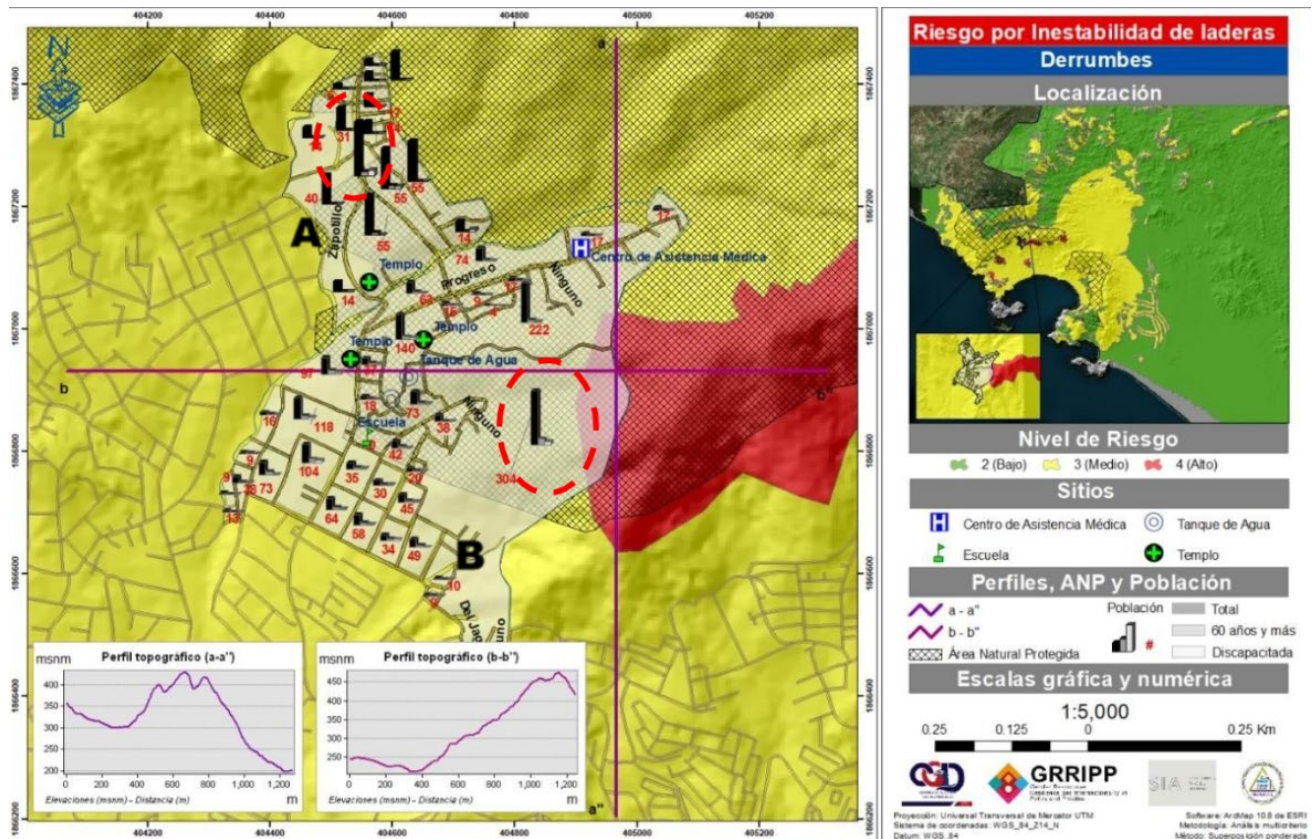
Map 5. Landslide Risks with Total Population.  
Prepared by the authors, 2023, based on INEGI, S/N

There is also a population of 154 people with some type of disability: 66 men and 88 women, with physical, visual, and hearing disabilities being the most frequent (INEGI, 2023).

<sup>6</sup> Landslide: Sudden movements of earth, rocks, and other elements that move down a slope involving factors such as rain, soil erosion, seismicity, alteration of the slope, which can be of lesser or greater magnitude due to the loss of resistance of the materials, in turn sliding at low or high speed (CENAPRED, 2021).



The population with some type of disability and over 60 years of age is distributed within the neighborhood as shown in Map 6. It is worth noting that most of the people that belong to this vulnerable group live in Zone A, part of Zapotillo (north), and near Señor De Calvario chapel (Zone B).



Map 6. Landslide Risks and Distribution of Population with Disabilities and Over 60 Years Old. Own elaboration, 2023 based on INEGI, S/N

The following picture shows an example of a possible landslide that could be caused by excess water in the event of heavy rainfall.



Photo 22. Risk due to a Landslide.



In addition, risk due to falling blocks can also be observed in the following pictures. It should be noted that this is a significant risk for the inhabitants, houses, and infrastructure located at the foot of the slope.



Photo 23. Risk due to Falling Blocks



Photo 24. Risk of Blocks Falling on Houses.

### 3.2.5. Risk due to Hydrometeorological Phenomena

The assessment of the risk level for tropical cyclones considered the historical occurrence of events on the west (W) side of the country, within the Pacific Ocean, and within a radius of 200 kilometers around Acapulco, considering the oldest to the most recent event in a 24-year period.

Name	Timeliness
<b>Rick</b>	22/10/2021 - 25/10/2021
<b>Julio</b>	05/09/2020 - 07/09/2020
<b>Narda</b>	28/09/2019 - 01/10/2019
<b>Carlotta</b>	14/06/2018 - 18/06/2018
<b>Ileana</b>	04/08/2018 - 07/08/2018
<b>Vicente</b>	19/10/2018 - 23/10/2018
<b>Max</b>	13/09/2017 - 15/09/2017
<b>Trudy</b>	17/10/2014 - 18/10/2014
<b>Manuel</b>	13/09/2013 - 19/09/2013
<b>Carlotta</b>	13/06/2012 - 16/06/2014
<b>Estelle</b>	05/08/2010 - 10/08/2010
<b>Tropical Depression Eight</b>	20/08/2010 - 21/08/2010
<b>Pauline</b>	05/10/1997 - 10/10/1997

Table 5. Tropical Cyclones in the Pacific Ocean  
Prepared by the authors based on CONAGUA and Historical Hurricane Tracks.

Subsequently, a spatial analysis was carried out; the methods used to obtain the tropical cyclone risk models were the density of lines or trajectories, and the density of points or registry of maximum wind gusts. At both the state and municipal levels, the five risk levels were obtained. The most relevant results are presented below:

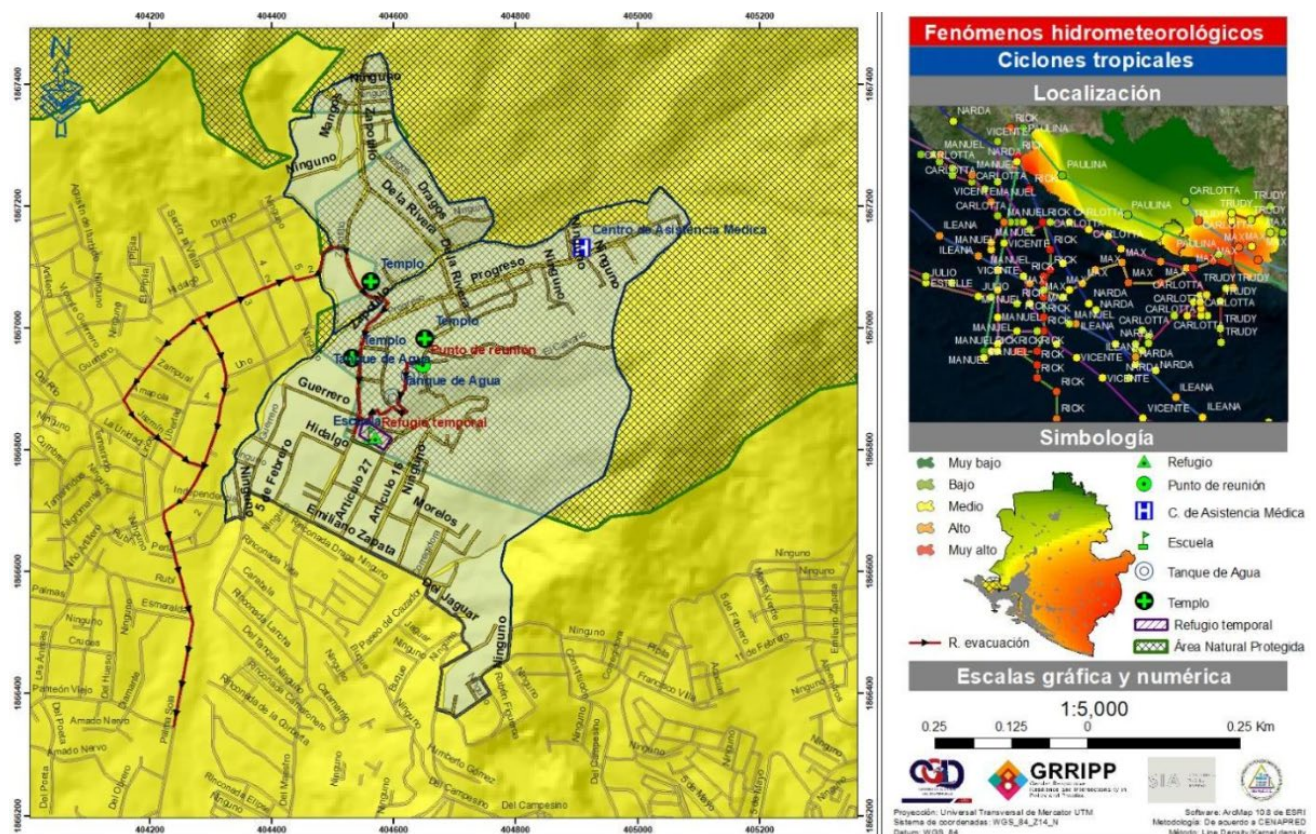
First, at the state level, the coastal strip is the most affected, while the risk decreases towards the northern part of the state. Second, at the municipal level, the southeast (SE) end registers high and very high levels of risk, and the level of risk decreases in the northwest (NW) direction with intermediate and low levels.

At the micro level, Colonia Palma Sola is at the intermediate risk level for tropical cyclones.

Finally, it is important to note that Hurricane Pauline in 1997 considerably affected the Palma



Sola neighborhood. Although it registered lower wind gusts compared to other events, it made landfall and crossed the city and the State of Guerrero causing direct and considerable damage during its trajectory.



Map 7. Risk due to Hydrometeorological Events  
Prepared by the authors, 2023, based on INEGI, S/N

## 4. Results ●●●

### 4.1. Participatory Action Protocol

The protocol seeks to reduce the impact on real estate and human lives, as well as to improve the living conditions of the inhabitants and people with disabilities.

This evacuation protocol was designed to be used in the event of a disaster and/or emergency in the event of hydrometeorological phenomena, mainly hurricanes, and is composed of three response phases:

- I. Before (Prevention).
- II . During (Evacuation and Assistance).
- III . After (Return to normal / Damage assessment).

In the event of an emergency situation that exceeds the community's response capacity, it is important to mobilize resources, such as medical services, trained personnel for rescue work, and units, among others. In such a case, the three levels of government must be involved—municipal, state, and federal—to handle and manage the emergency. It should be noted that each emergency is different and has some degree of complexity: in some cases, specialized medical assistance is required, while others only cause alterations to the infrastructure or services and sometimes deaths. Therefore, sometimes it is beyond the community and the authorities themselves to respond.

It is important to carry out actions to prevent and mitigate impacts and include the participation of the entire population: men, women, young people, boys and girls, people with some type of disability, mobility problems, or the elderly, and to ensure that everyone has the same opportunities to participate and adopt measures in the event of any emergency.

Finally, it is highly recommended to have an incident log that allows the community to record previous accident experiences and risk identification, which can be the basis for improving safety measures. See appendix pages 58 and 59 for more information.

The following explains the difference between an emergency and urgency to learn more about these concepts.

### 4.1.1. What Is an Emergency and an Urgency?

First of all, it is necessary to identify the differences between an emergency and an urgency in order to be able to act in a convenient and organized manner. The definitions of emergency and urgency are described below:



<p style="text-align: center;"><b>Emergency</b></p> 	<p>It is a situation that arises unexpectedly that can cause damage to society and can pose an excessive risk to the integrity and safety of the population and real estate; it is necessary to act immediately, since life may be in danger (STCONAPRA, 2017).</p> <p>Its causes may be the result of different factors, such as human errors, technical failures, defects in the design of installations, natural phenomena, and those of external origin - human factor.</p>
<p style="text-align: center;"><b>Urgency</b></p> 	<p>It is a situation that is not imminently life-threatening and does not endanger any vital part of the body, where medical assistance is required within a reasonable period. The difference is that it does not imply immediate risk of death, e.g., nervous breakdown, high fever, headache, sore throat, earache, dizziness, bronchitis, vomiting, etc.</p>

Table 6. Difference between an emergency and urgency.

Once the differences between emergency and urgency have been expressed, the next step is to explain what hurricanes are and what needs to be done in the event of this hydrometeorological phenomenon.

### 4.1.2. What Are Hurricanes?

These are natural phenomena that originate and develop in warm and temperate seas, with storm clouds, strong winds and abundant rainfall. According to the speed of the winds, this phenomenon is classified as **Tropical Depression** when its maximum constant winds reach 62 km/h; Tropical Storm when its maximum constant winds are between 62 and 118 km/h; and **Hurricane** when its winds reach 119 km/h or exceed 251 km/h for category 5.

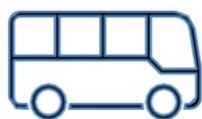
The season begins in May and ends in November. Each year, the Municipal and State Civil Protection are responsible for informing the population through early warning systems about the occurrence and evolution of these phenomena, as well as the corresponding dissemination in the different media.

### 4.1.3. What to Do in Case of Hurricane Impact?

In the event of a hurricane, it is necessary to deploy prevention activities before, during, and after the phenomenon to avoid, as far as possible, material and human losses. These activities are listed below.

## Protection Activities

### Before



- Conduct talks and meetings with family members, community members and friends to organize a family civil protection plan in case it is necessary: move to a safe place, protect your property, and safeguard the integrity of your family.
- Make the necessary repairs to roofs, windows, and walls to prevent further damage. Reinforce and secure doors and windows.
- Determine and coordinate means of transportation for family members who are sick, elderly, children, or disabled.
- Know and identify safe routes and meeting points, as well as temporary shelters within the community.
- List emergency numbers and place them on the refrigerator or near every phone in the house. Also have them saved in your cell phone.





- Keep informed of the bulletins and early warnings of the hurricane season issued by the three levels of government and official sources through the different means of communication (Radio, Television, Facebook, Text Messages, among others).
- If you have enough time and live in an area where rivers rise, elevate furniture to protect it from flooding, or better yet, move it to a higher floor or location.
- Have a first aid kit and emergency backpack on hand with necessary supplies, such as a radio, a battery-powered flashlight with spare parts, bottled water, canned food, basic cleaning supplies, and an emergency battery. Also, safeguard important documents of family members and other relevant documents such as birth certificates, property titles, credentials, etc. Keep them in plastic bags to prevent them from getting wet. Keep the backpack in a safe area in case it is used so that it can be easily used.
- In case of evacuation: stay calm and reassure your family members. An upset person can make many mistakes.
- If you have a portable radio, continue to listen to it for hurricane-related information or instructions.
- Disconnect all electrical appliances and, if possible, turn off the power switch.
- Turn off gas and water faucets.
- Alert your neighbors and inform your relatives and people in the community, in case they are not aware of the hurricane warning.
- Stay away from trees and poles at risk of falling.
- Stay at home, if it is safe, and if not, move to the temporary shelter already planned.

## Protection Activities

### During



- Remain calm in case of being at home, have constant communication with family and neighbors through phone calls, messages, or WhatsApp, as long as there is no power outage, in order to maintain a backup battery in case of an emergency.
- Listen constantly to a radio or television to keep informed of the hurricane's movement through official instructions. Stay indoors, away from windows and glass doors.
- Keep all family members at ease.
- Be alert for any unusual situation that may arise during the hurricane's trajectory.
- Do not leave until the authorities report that the danger is over.

### After



- Call an emergency number (such as 9-1-1) in case of an emergency in your home or on an adjacent street.
- Follow instructions issued by radio or other means.
- Check the condition of your home to make sure it is safe; if there is no damage, stay there.
- Check the conditions of the electrical power and gas supply, and do not attempt to restore it until it is safe.
- Before connecting your electrical appliances, make sure they are dry.
- Do not listen to rumors and follow only the indications of the authorities.

#### 4.1.4. What to Do in Case of Hurricane Impact for People with Disabilities?

In the event of an emergency, people with disabilities are more vulnerable than others, either because they are affected by mobility problems or by any other type of sensory limitations that may influence the perception of the situation.



##### a Tips for people with motor disabilities

- Encourage people with disabilities to become familiar with warning systems and evacuation procedures.
- Encourage them to be autonomous and to be able to react to emergencies.
- Identify the safe areas within the home, as well as the areas of least risk.  
Keep an emergency supply kit, which can be used in an emergency, attached to your walker, wheelchair, or scooter.
- Teach others how to operate a wheelchair.
- Have an extra cane or walker for emergencies.
- Have an extra seat cushion to protect your skin or maintain balance and carry it with you in case it is necessary to move somewhere else.



##### b Tips for children and adults with autism

- Remember to pack favorite toys, movies, and electronic games. Familiar items will help children feel comfortable in new surroundings and lessen the stress of transition.
- Hearing aids or earplugs can attenuate noise in unfamiliar environments.
- Consider bringing tape to mark the perimeters of your family's assigned space in the group shelter.
- Children with autism often go out for a walk. Talk with teachers, police, and community members to develop an emergency plan to protect children from dangerous situations.
- Practice breathing exercises together with a caregiver who invites them to inhale and exhale and repeat as many times as necessary until they feel calmer.





### 4.1.5. Emergency Routes

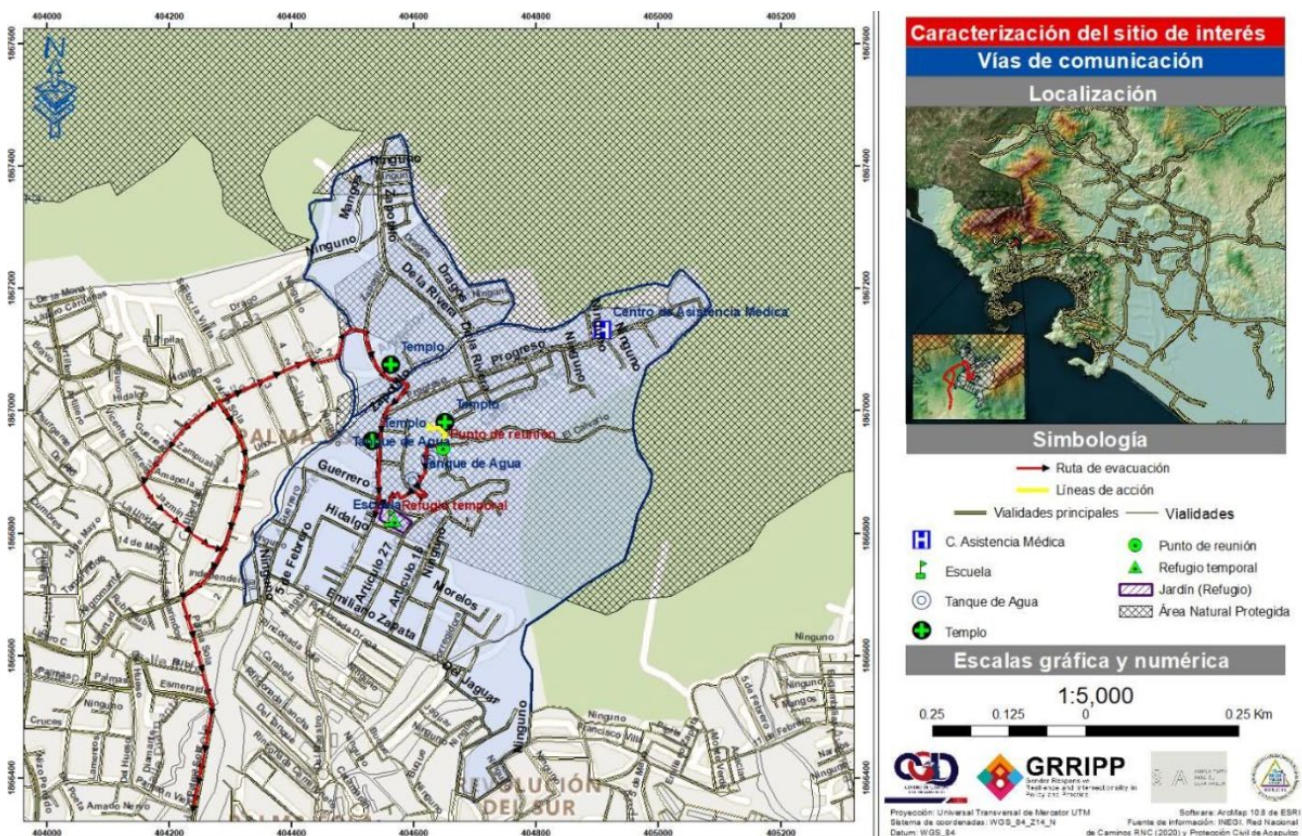
One of the most important roads in Colonia Palma Sola is the two-way, two-lane Palma Sola Avenue, located on the southwest (SW) of the neighborhood. This road is part of one of the evacuation routes proposed by the Acapulco Municipal Civil Protection Directorate (PC), where the routes can be identified because they are marked with red lines.

Within the neighborhood there is a two-way street called Constitución 27, which is part of the evacuation routes proposed by Civil Protection. It is also marked in red on the map.

The Señor Del Calvario chapel was proposed by the community as a **meeting point** in case of an emergency, it is a midpoint for the inhabitants living in the upper part.

The line of action within the Andador Abasolo with the installation of a handrail, restoration of a ramp and signaling of stairs, which connects with the **meeting point (Señor Del Calvario chapel)**, was proposed as a complete route by the neighbors. In addition, it leads to the **temporary shelter point "Jardín de Niños Luz María Serradel."**

Among the most important roads connecting Colonia Palma Sola are Ruiz Cortines Avenue and Cuahtémoc Avenue, which are connected to public and private hospitals. This allows firefighters, red cross, or civil protection personnel to reach the area quickly.



Map 8. Communication Routes and Emergency Routes.  
Source: INEGI, n.d., and Municipal Civil Protection of Acapulco.

The city of Acapulco has 20 zones subdivided as temporary shelters strategically distributed in the territory, based on the temporary shelters 2022, established by the Municipal Civil Protection. The Palma Sola neighborhood belongs to zone 7-Camarón with five shelters:

Temporary shelters in Palma Sola	
1	Santuario de Nuestro Padre Jesús, calle Niño Perdido esq. Circunvalación s/n, col. Santa Cruz
2	Jardín de niños Luz María Serradel, calle Constitución s/n, col. Palma Sola FOVISSSTE
3	Jardín de niños Educadora Guerrerense, Av. del Maestro s/n, col. Palma Sola
4	Unidad Deportiva Acapulco, calle Baja California esq. con calle Oaxaca s/n, col. Progreso
5	Esc. Sec. Tec. 1 Juan de Dios Bátiz, Av. Ruiz Cortines s/n, col. Alta Progreso

Table 7. List of Temporary Shelters 2022.  
Own elaboration, 2023. H. Ayuntamiento Municipal de Acapulco 2021-2024/Temporary shelters 2022.

## ● Emergency Numbers

The 911 emergency number that is available 365 days a year 24 hours a day assists and channels medical and security emergencies. Municipal and State civil protection and Mexican Red Cross send the necessary support and the nearest units (Government of Mexico, 2017).

In addition, it provides:

- **Assistance:** You can access any emergency service such as firefighters, police, civil protection, among others.
- Protocols for specialized care for victims of gender violence are implemented.

911 is a toll-free number and can be called from any mobile device, private landline, or public phone. If the call is cut off, it is possible for the operator to identify the phone number from which the call was made to return the call.

It is likely that the person answering the call will require more precise data for channeling and reporting based on the emergency that arises, such as the address, references, who is reporting, narration of the facts, etc. This service sends the information to the emergency units according to the event (EDOMEX, 2023).

The following is a directory of local emergency numbers that includes municipal, state and federal government agencies, ambulance services, and private and public hospitals. These telephone numbers were currently working at the time this protocol was submitted.

Agency	Telephone No.
<b>Emergencies</b>	911
<b>Ambulancias Internacionales</b>	(744) 481 0833
<b>Mexican Red Cross Acapulco Delegation</b>	(744) 481 2691 (744) 481 3385
<b>Firefighters</b>	(744) 484 41 22
<b>Civil Protection Acapulco</b>	072 (744) 4 40 70 31/32 (744) 4 40 61 70 (744) 4 85 61 65
<b>CAPAMA</b>	073 (744) 484 9800 (744) 481 1854
<b>CFE</b>	071
<b>Anonymous reporting</b>	089
<b>DIF Acapulco</b>	(744) 483 9812
<b>State Attorney General's Office</b>	(744) 486 0443
<b>Acapulco Municipal Women's Institute</b>	(744) 488 13 02
<b>Secretary of Protection and Roads</b>	(744) 177 57 19
<b>H. Municipal Council</b>	(744) 440 70 00
<b>El Quemado General Hospital</b>	(744) 116 63 77
<b>ISSTE General Hospital</b>	(744) 435 0770
<b>Magallanes Private Hospital</b>	(744) 469 0270
<b>Papagayo Private Hospital</b>	(744) 486 33 00
<b>Pacífico Private Hospital</b>	(744) 487 5419
<b>Santa Lucia Private Hospital</b>	(744) 486 4349
<b>IMSS Hospital General Regional Vicente Guerrero</b>	(744) 445 5371

Table 8. Emergency directory.  
 Source: Own elaboration, 2023.



## ● Official Websites

Remember to check only official pages to keep you informed, such as the following:

- Municipal Civil Protection:  
<https://acapulco.gob.mx/proteccioncivil/>
- State Civil Protection:  
<http://proteccioncivil.guerrero.gob.mx/>
- National Civil Protection Coordination:  
<https://www.gob.mx/cenapred>
- National Water Commission:  
<https://www.gob.mx/conagua>
- Secretary of the Navy:  
<https://meteorologia.semar.gob.mx/>
- National Weather Service:  
<https://smn.conagua.gob.mx/es/>

## ● General Recommendations

- Update this document annually or as often as necessary, e.g., the emergency telephone directory and temporary shelters.
- Each rainy season, meet with neighbors or family members to design and implement actions to help reduce risks and react more adequately during an emergency.
- Involve children, young people, and people with disabilities or limitations in these processes.
- Work with the Civil Protection Department for courses, drills, training, or assessment of an area considered to be at risk.
- Have an emergency first aid kit in each home (basic medicines, drugs for people with chronic illnesses, and medicines to cure them).
- Keep informed by using official sources, reliable social networks, WhatsApp groups, or radio.
- Have an emergency directory in each household (closest people, neighbors, and authorities).
- Invite people to participate and share this protocol with the neighbors and family members of Palma Sola.
- Keep the community committee active (through other activities).
- Periodically review the emergency kit and keep it stocked with supplies.
- Check that the folding stretcher is in good condition.
- Keep informed of Early Warning Systems.
- Use the incident log every rainy season in the event of an accident, this allows us to have a record and act.

## 5. Reflections ●●●

### 1. Reflection on the Achievement of the Objective

The development of the inclusive protocol in Colonia Palma Sola allows recognizing that at the local and micro level, DRR is complex and requires the collective participation of local and state authorities, academia, and civil society to deepen public policies aimed at prevention and emergency care that strengthen knowledge on disaster risk management. It also involves improving the quality of life through public policies, strategies, and technical advice and public investment for the readjustment of spaces, for which coordination among those involved is necessary.

The elaboration of the participatory and inclusive protocol was a dynamic and different process at the same time; it is common for a protocol for emergency response to be carried out in a top-down technical manner. On the contrary, this was a learning process, nurtured and shaped by local needs. Providing a stretcher and an emergency kit, as well as adapting the infrastructure and training, strengthen the processes of resilience and DRR that are present in the territory and that are rarely made visible.

The team believes that the participatory evacuation protocol made it possible to:

- Build on existing knowledge and respond to the needs of the people of the colony.
- Have a visible change such as painting the stairs and installing the handrail.
- Systematize knowledge in a useful document (protocol).
- Increase interest in continuing to implement prevention actions through collective participation.
- Build skills for evacuation and first aid that have already been used.

Some possible lines of interest to continue the reflection generated by the participatory protocol were:

- Replicate the process in other neighborhoods and involve more neighbors in the actions and knowledge of the protocol.
- Generate a disaggregated profile within the protocol to deepen gender awareness.
- Establish continuous capacity building and capacity generation actions through the community committee.

### 2. Reflection on the Method and Process

There is a solid base of neighbors in Palma Sola who show interest in learning and generating resilience actions. During the implementation process, the participation of each of the stakeholders was fundamental. However, there is still much to be done to broaden the participation of more people and avoid exclusion processes.

The conditions of insecurity at the community level were a limiting factor in concluding the participatory and face-to-face processes in the neighborhood; it is worth mentioning that different alternatives were sought to consolidate the work process.

The implementation of participatory techniques made it possible to promote the gender perspective by including women, men, girls, boys, adolescents, people with disabilities or mobility issues, and the elderly, which generated a positive learning process. It was observed that the population identifies its risks and vulnerabilities and that over time they have generated adaptation processes and techniques. It should be noted that disaster events have marked the memory of the population, and have generated integration processes, common experiences, and resilience at the community level.

The emphasis on capacity building is another factor that contributes to this inclusive vision. The protocol has allowed the people of the community to be directly empowered to take a leadership role in an emergency. This can lead to larger community-led projects using the skills acquired through this process.

Risk analysis at the community level, based on local knowledge, made it possible to generate good practices that favored the strengthening of local capacities to improve the quality of life through the improvement of spaces that meet the needs of vulnerable groups.

This process goes beyond the creation of the participatory and inclusive protocol. Based on the experiences shared by the community, it is possible to understand the dynamics of emergency response in the city and how it impacts on the inhabitants of the Palma Sola neighborhood, who at the same time become resilient and adapt.

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### 3. Reflection on Resilience Building and Advances in Gender and Intersectional Perspectives

The process was guided and led by women who participated actively. They take on different roles ranging from household chores to caring for children, people with disabilities, internal management within the neighborhood; they are also the first responders in an emergency. Women play a fundamental role at the local level.

We consider that the work process contributed to the creation of community resilience because they have the tools to respond to an emergency in a better way.

The inclusion of children and young people facilitated the process of integrating the women, which at the same time allowed the creation of learning processes for the families.

Implementing an inclusion form for families who were responsible for or caregivers of people with reduced mobility, disabled, or neurodivergent individuals allowed the needs and participation of other people to be included in a different way, thus explicitly integrating an intersectional characteristic into the protocol.

The team considers that the evacuation protocol contributed to resilience and risk management in relation to climate change through the establishment of clear processes, skill building, and access to resources that were not previously available and that open the possibility of expansion through the people who participated as well as the leadership tools they acquired. Likewise, it contributed to resilience and risk management by generating community ties and establishing a committee to respond to emergencies with greater preparation and systematization of their previous knowledge. This community strengthening led to an increase in risk management awareness, which may generate greater interest in different members of the community to learn about the topic, participate in future drills, and increase coordination.

The team considers that specific actions were carried out to privilege the voices of local people, especially women in the community. The diagnosis on which the protocol was built was based mainly on the vision of women and included children and young people to strengthen the process. Likewise, there was a strong intersection with socioeconomic and cultural levels. Voices that are not normally considered were given space, not only to approve documents or plans, but also to plan and take leadership roles in execution processes. Likewise, the participation of caregivers was specifically included to consider their needs in the development of the protocol.



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## 7. Appendices ● ● ●

### 7.1. Incident Log

A logbook allows having a record of the number of incidents that occur in the neighborhood; for the logbook to work properly, it is important to have one or more people in charge. It should be reviewed, analyzed periodically and, if possible, have photographic material (CMDPDH, 2015). Subsequently, it should be reviewed by those responsible or in a group manner and ask the following questions:

1. Do the incidents leave any lessons learned or recommendations for strengthening safety measures?
2. Are the measures and protocol we have in place sufficient?
3. Is a revision, update, or modification of the protocol or in the environment/ or in the intervention of authorities necessary? For instance, infrastructure, lighting, tree trimming or caution sign, etc./intervention of civil protection or CFE, among others.
4. How do I/we feel about the incidents?
5. Is it necessary to seek professional sessions to contain stress, panic, or anxiety? For instance, art therapy, psychological help, recreational activities, training in first aid, technology, or a specific topic.

These series of recommendations are part of the manual “La protección a personas defensoras de derechos humanos a través de su capacitación y visibilidad” (Protection of Human Rights Defenders through Training and Visibility), adapted to the needs of this protocol and can be adjusted to local needs or family protocols. Implementing the logbook provides a broad overview, detecting the causes, strengthening the actions and capacities of men, women, caregivers, or persons responsible for people with disabilities or mobility problems, or neurodivergent persons.



Below is an example of how to fill out the form:

Incident Description	Date When?	Location Where?	Victim and age Who was affected?	Responsible Party Who?	Origin What was the cause?	Transfer Own means, private or public	Assistance Did any emergency agency help?
At 10 am, I heard a woman screaming for help, I found my neighbor on the floor, she had suffered a fall and was in severe pain in her left foot.	June 10, 2023	Andador Abasolo, three meters from the water tank	Alma Perez 60 years old	Martin Aguirre	Due to several days of rain, the stairs were slippery and she skidded.	Private ambulance	No

### 7.1.1. Visual Material for the Protocol and Drill

These materials are designed to be easily shared via WhatsApp.



**LISTA DE REFUGIOS TEMPORALES EN PALMA SOLA**

- Santuario de Nuestro Padre Jesús, calle niño perdido esq. circunvalación s/n, col. Santa Cruz.
- Jardín de niños Luz María Serradel, calle constitución s/n, col. Palma Sola Fovissste.
- Jardín de niños Educadora Guerrerense, av. del maestro s/n, col. Palma Sola.
- Unidad Deportiva Acapulco, calle Baja California esq. con calle Oaxaca s/n, col. Progreso.
- Esc. Sec. Tec. 1 Juan de Dios Bátiz, av. Ruiz Cortines s/n, col. Alta Progreso



**PÁGINAS OFICIALES**

- Protección Civil Municipal:**
  - <https://acapulco.gob.mx/proteccioncivil/>
- Protección Civil Estatal:**
  - <http://proteccioncivil.guerrero.gob.mx/>
- Coordinación Nacional de Protección Civil:**
  - <https://www.gob.mx/cenapred>
- Comisión Nacional del Agua:**
  - <https://www.gob.mx/conagua>
- Secretaría de Marina:**
  - <https://meteorologia.semar.gob.mx/>
- Servicio Meteorológico Nacional:**
  - <https://smn.conagua.gob.mx/es/>

## NÚMEROS DE EMERGENCIA

Emergencias	911
Ambulancias Internacionales	(744) 481 0833
Cruz roja Mexicana Delegación Acapulco	(744) 481 2691 / (744) 481 3385
Bomberos	(744) 484 41 22
Protección Civil Acapulco	072 / (744) 4 40 70 31/32 / (744) 4 40 61 70 / (744) 4 85 61 65
CAPAMA	073 / (744) 484 9800 / (744) 481 1854
CFE	071
Denuncia anónima	089
DIF Acapulco	(744) 483 9812
Fiscalía General del Estado	(744) 486 0443
Instituto Municipal de la Mujer Acapulco	(744) 488 13 02
Secretaría de Protección y Vialidad	(744) 177 57 19
H. Ayuntamiento Municipal	(744) 440 70 00
Hospital General El Quemado	(744) 116 63 77
Hospital General ISSTE	(744) 435 0770
Hospital privado Magallanes	(744) 469 0270
Hospital privado Papagayo	(744) 486 33 00
Hospital privado del pacífico	(744) 487 5419
Hospital privado Santa Lucía	(744) 486 4349
IMSS Hospital General Regional Vicente Guerrero	(744) 445 5371

## !Ven y participa! SIMULACRO PALMA SOLA

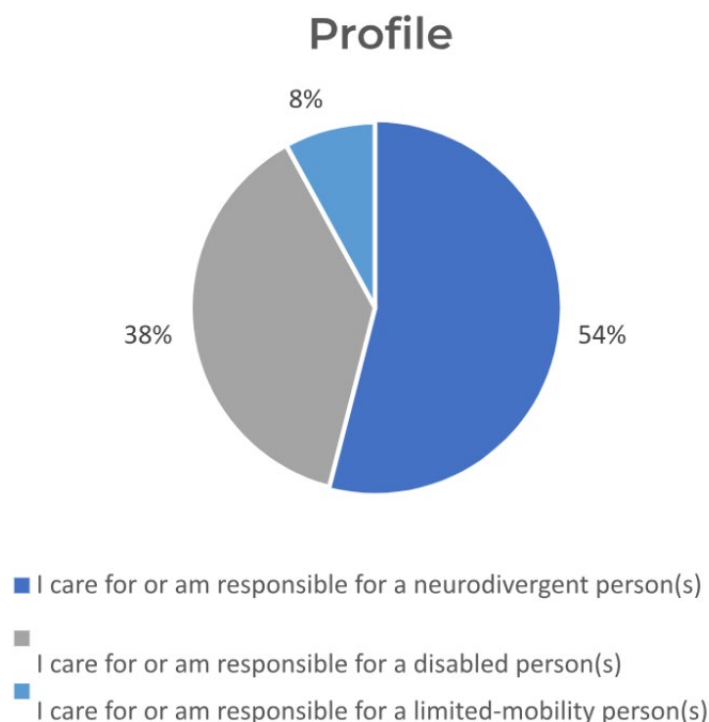
DÍA: 06 DE MAYO 2023  
HORA: 12:00 PM  
LUGAR: CAPILLA DEL SR. DEL CALVARIO

**!Prevenir es tarea de todos!**

## 7.2. Results of the Inclusion Form

To strengthen the diagnosis of inclusion of the evacuation protocol, a small survey was generated and distributed among families in the Palma Sola and Burócratas neighborhoods that had people with low mobility, disabled, or neurodivergent. Four questions were asked, and 13 responses were recorded. The analysis of the information shared is presented below.

When asked how the respondents identified themselves, 100% were caregivers or persons responsible for neurodivergent persons with disabilities or limited mobility distributed as follows:



The next question asked what makes evacuation more complicated in the event of a hurricane or flood. In this question we had two types of responses. One group of responses referred to characteristics related to challenges presented by the type of disability, mobility problem, or characteristics of their neurodivergence. The second group refers to challenges related to the infrastructure of the site, which are characteristics in which the protocol and the intervention being carried out can have an impact to limit the negative effects of the same.

Challenges related to people's profile	Challenges related to the characteristics of the infrastructure
<b>Keeping my child calm</b>	The streets
<b>The person does not understand what I say</b>	My daughter experiences a crisis, and it is difficult to go out with her in my arms, especially in places with many stairs
<b>My child freaks out when he/she is taken out of his/her environment</b>	Where to shelter or protect yourself
<b>Keeping the person calm</b>	Limited possibilities to move around
<b>For my grandchild to understand the directions</b>	Leave the house
<b>Communication</b>	There is no complication in the area where I am located, it is quite acceptable for proper evacuation
<b>The noise of rain and thunder as it disturbs them</b>	



They were asked about what would be most useful to know in advance or learn in order to make evacuation easier and safer in the event of a hurricane or flood. Responses were divided into the same two categories, with the following answers:

Opportunities related to people's profile	Opportunities related to the characteristics of the infrastructure / protocol
<b>How to control/manage these crisis moments</b>	The nearest help points
<b>Communication</b>	Where to go, or if there are any special places for people with disabilities
	A drill
	Shelters, medical care, evacuation routes
	The exact location of the shelters
	Knowing which are the places of protection
	To communicate
	Evacuation route
	Keep us informed so that we can leave before a misfortune occurs.
	Perhaps breathing techniques or techniques to remain calm
	Knowledge of rapid response to catastrophic unforeseen events

The greatest number of opportunities are related to having prior knowledge of how to react and where to go, as well as facilitating ways to communicate during the emergency.

Finally, they were asked if they already carry out any practices to evacuate more safely and easily during a hurricane/flood, in order to take advantage of such knowledge. Seventy-seven percent of the people said that they do not have any yet, while 23% of the people said they do, but only one person stated that it is the civil protection agency from whom they have received multiple trainings.

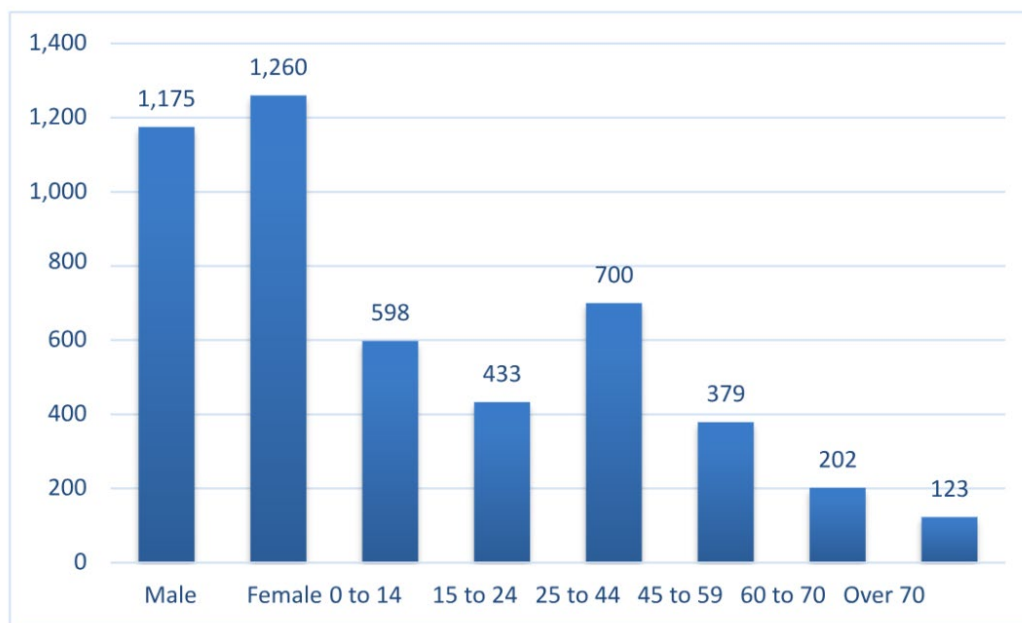
The following is general information about the Palma Sola neighborhood, including sociodemographic aspects, social indicators and technologies, and public services. The objective is to have a broader context of the neighborhood and be able to consult it quickly.

## 7.3. Sociodemographic Aspects

### 7.3.1. Population

The Colonia Palma Sola FOVISSSTE is composed of two AGEB <sup>7</sup>: 14130 and 14395, with a total population of 2,435, of which 48.2% are men and 51.7% are women. According to CONAPO, the group ranging from 25 to 44 years old is characterized by a population of young adults with 29%, followed by the population from 0 to 14 years with 24%, and the range of 45 to 59 years with 15% (Figure 2).

Figure 2. Population by Sex and Age, 2020.



Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.

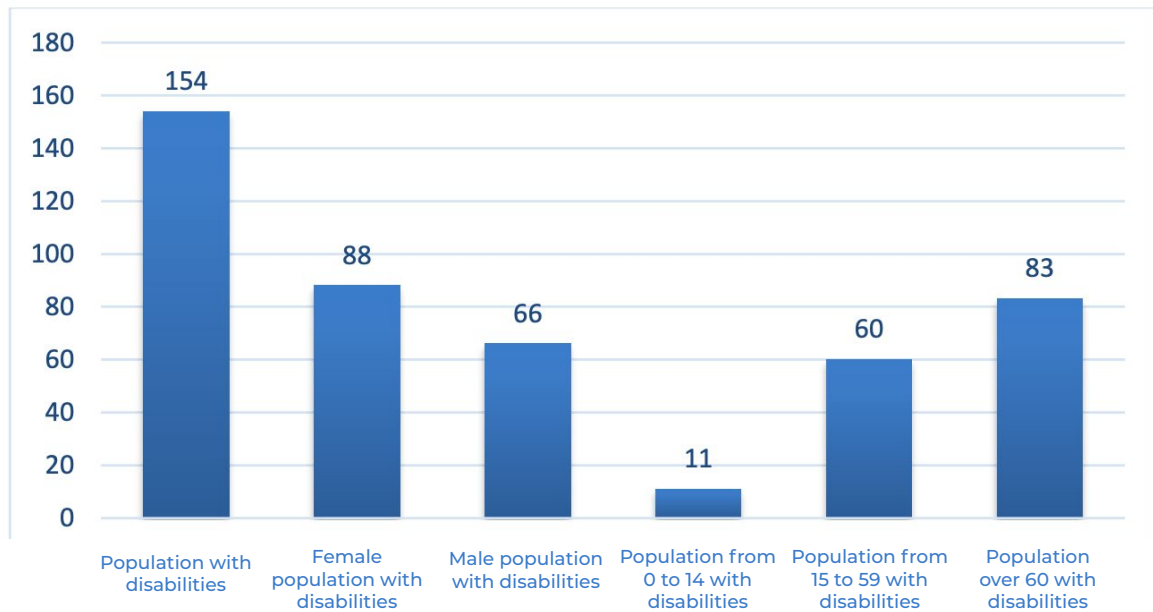
### 7.3.2. Population with Disabilities and Limitations

According to INEGI, the term “person with a disability” refers to “a person who has some physical or mental limitation to perform activities at home, school or work, such as walking, dressing, bathing, reading, writing, listening, etc.”

In Palma Sola, there are 154 people with some type of disability; 57% are women while 43% are men, and are distributed in three ranges: 0 to 14 years old (7.1%); 15 to 59 years old (40%); and 60 years and older (55%), which is where the largest number of the population with some type of disability is concentrated (Figure 3).

<sup>7</sup> “An urban basic geostatistical area (AGEB) is a geographic area occupied by a set of blocks perfectly delimited by streets, avenues, walkways, or any other easily identifiable feature on the ground and whose land use is mainly residential, industrial, service, commercial, etc. They are only identified within urban areas, which are those with a population greater than or equal to 2,500 inhabitants and in municipal capitals” (CONEVAL, n.d.).

Figure 3. Population with Disabilities by Sex and Age, 2020.



Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.

The types of disability are shown below. In the first place, there are 80 people who have “difficulty walking, climbing, or descending stairs due to the lack of all or part of their legs; it also includes those who have their legs and have no movement or restrictions to move, so they need help from other people, wheelchairs or other devices, such as a walker or artificial leg” (INEGI, 2020). In second place, 64 people have visual problems; and in third place, 32 inhabitants have some mental problem or condition (Table 1).

Table 1. Types of Disability, 2020.

Type of disability	No. of people
Population with walking, climbing, or descending disabilities	80
Population with visual impairment, even when wearing glasses	64
Population with speech or communication disabilities	17
Hearing impaired population, even when using hearing aids	28
Population with disabilities in dressing, bathing, or eating	22
Population with disabilities to remember or concentrate	29
Population with a mental problem or condition	32

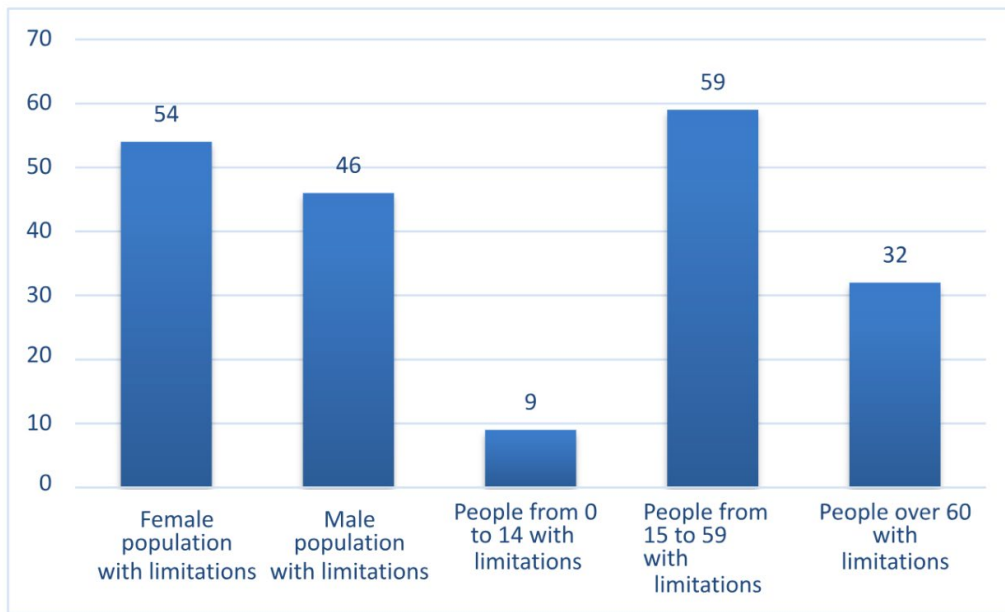
Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.



The following figure shows people with some type of limitation; it should be noted that “a person can have more than one disability, for example: deaf-mutes have a hearing limitation and another language limitation, or those who suffer from cerebral palsy have motor and language problems.” This is how INEGI defines it and for this reason the figures may vary considerably in both AGEB.

As can be seen, 54% are women and 46% are men with some limitation, of which the population aged 60 years and older is the one that presents the most limitations (59%), followed by the age range of 15 to 59 years with 32% (Figure 4).

Figure 4. Population with Limitations by Sex and Age, 2020.

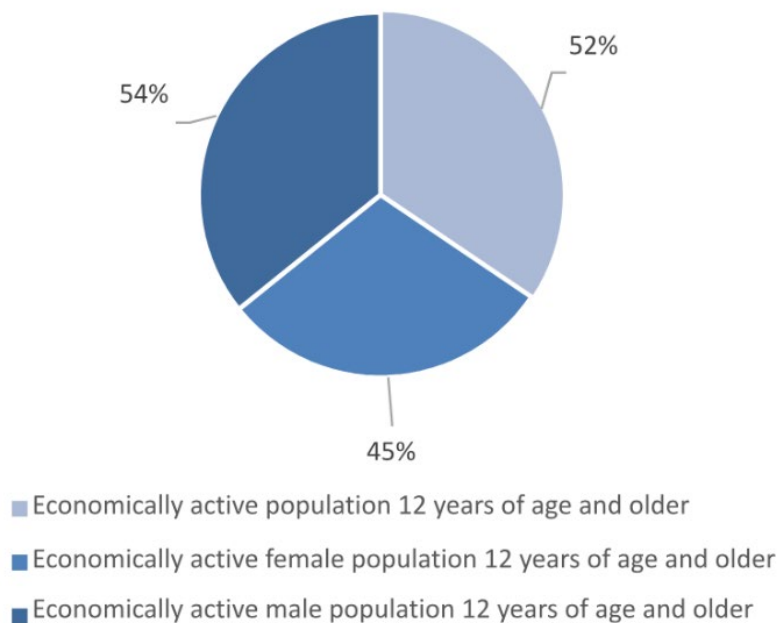


Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.

### 7.3.3. Economically Active Population (EAP) by Sex and Age Group

Based on statistical data from INEGI (2020), 52% of the population aged 12 years and older is economically active. With respect to the total population, 54% are economically active men, while 45% are women. This is due to the fact that most women are engaged in household chores, which is “unpaid work”. Finally, the economically inactive population includes students, pensioners or retirees, the elderly, or people with some type of disability (Figure 5).

Figure 5. Economically Active Population, 2020.



Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.

The Colonia Palma Sola is made up of a young population; most of them are women with a minimal difference, and during the participatory process it was the women who were most present.

It is worth mentioning that the most frequent type of disability is the difficulty in walking, going up and down, which was really visible during the process of accompaniment in the neighborhood. Several women had difficulty walking and knee pain; a possible cause of this are the conditions of the streets, since they have to climb many stairs to reach their homes and in general the neighborhood is located in an area with a significant slope.

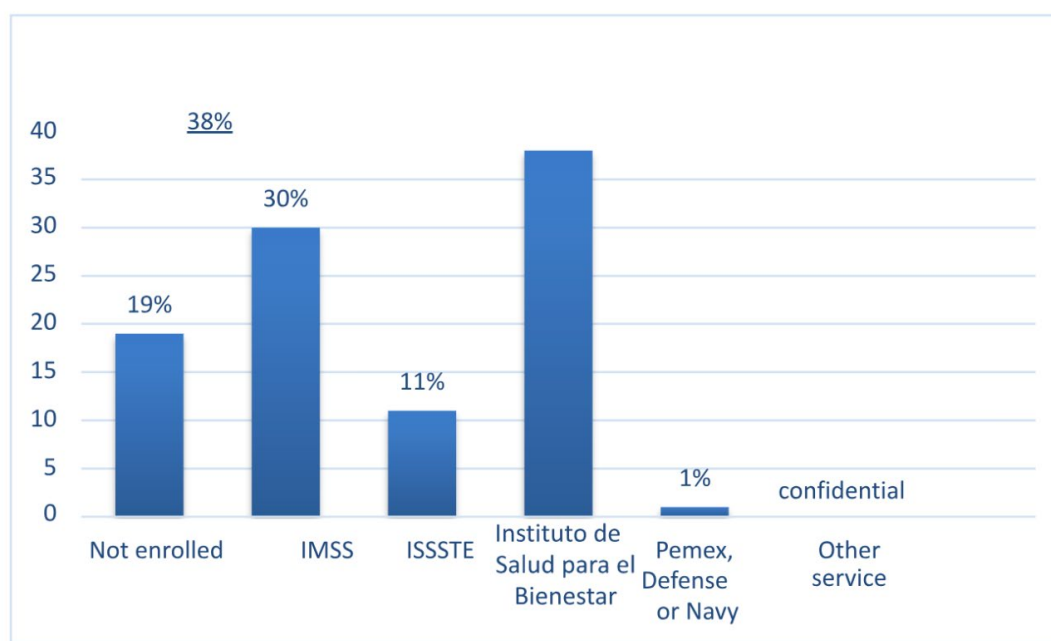
In general, 54% of the male population is economically active, dedicated to their own businesses, masonry, employees, and merchants. On the other hand, 52% of women are economically active; during the visits they mostly mentioned being merchants, for example, by selling prepared foods, selling atole, and making bread. Another important aspect are the women in charge of the household who, although not considered as paid work, play a key role in the households and who were mostly involved in the process of creating a participatory and inclusive protocol.

### 7.3.4. Social Indicators

#### 7.3.4.1. Social Security

Figure 6 shows that the majority of the population of the Palma Sola neighborhood is enrolled in Instituto de Salud para el Bienestar (INSABI) (38%), followed by 30% with IMSS and 19% with no health insurance. In Figure 6, it is possible to observe that the majority of the population of Colonia Palma Sola is enrolled in Instituto de Salud para el Bienestar (INSABI) with 38%; in second place, 30% have IMSS; and in third place, 19% are not enrolled in any health service.

Figure 6. Social security, 2020.



Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.

### 7.3.4.2. Education

In the area of education and in general, the literate population shows favorable percentages: 94% of the population 15 years of age and older is literate, while 6% is illiterate.

However, Table 2 below shows the level of schooling attained. Thirty-four percent of the population has post-basic education, which includes the upper secondary education of the National Education System. This is an important point; as mentioned by Márquez (2015), the lapse of this change “constitutes the main bottleneck of the national education system, since it is there that a considerable number of young people abandon their studies, and many others, even when they manage to enter these levels, they drop out without completing them”. Subsequently, the figures for the level of schooling are more solid among the population 15 years of age and older with a complete basic education, which is 17%.

Table 2. Educational level by age range, 2020.

Level of education	Percentage
Population 15 years and older without education	5
Population 15 years of age and older with incomplete basic education	16
Population 15 years of age and older with completed basic education	17
Population 15 years and older with post-basic education	34
Population 18 years of age and older with at least one degree in medium higher education	16
Population 25 years of age and older with at least one degree in higher education	12

Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.



### 7.3.4.3. Social Backwardness Index

Regarding social backwardness<sup>8</sup>, based on CONEVAL (2020), the social backwardness index in the State of Guerrero is 2.45%, i.e., the degree of social backwardness is remarkably high, since it ranks third at a national scale. On the other hand, in the city of Acapulco the index is -0.58% with a low degree of social backwardness, unlike the AGEB of the Palma Sola neighborhood located in the outskirts: the AGEB 14130 with the greatest extension has a medium degree of social backwardness, while the AGEB 14395 presents a high degree of social backwardness (Table 3).

Table 3. Social Backwardness Index

Zone	Degree of social backwardness
Guerrero	Very high
Acapulco	Very low
AGEB 14130	Medium
AGEB 14395	High

Source: Own elaboration based on CONEVAL (2020).

The social backwardness of both AGEB of Colonia Palma Sola with medium and high degree was visible during the participatory tour. On the one hand, they lack basic services (utilities), since they do not have drinking water (water is extracted from springs by the inhabitants themselves), and drains are not connected to a pipe and form runoff. In addition, there are families who cook their food with firewood that they extract from the upper parts. On the other hand, there are low quality houses, some with cardboard roofs and improvised housing spaces.

## 7.3.5. Technology and Utilities

### 7.3.5.1. Technologies

Access to the technologies we use daily is part of our daily lives, but it becomes essential in the event of an emergency or disaster to be informed and prevent in time any situation that may affect the population. It is worth mentioning that the population of Palma Sola has a cell phone, TV, and radio, which they use to keep informed of early warnings, especially during the hurricane season. In general, 22% of the population has a TV, 21% has a cell phone, and 17% has a radio. However, there is an important percentage of the population that does not have access to internet and does not have a computer (13%). It should be noted that it is important to recognize that the use of technology for risk prevention is important, but in the event of a disaster, technology becomes obsolete due to various factors such as climate, network saturation, etc. (Table 4).

<sup>8</sup> The Social Backwardness Index (IRS, in Spanish) is a measure that aggregates variables of education, access to health services, basic services in housing, housing quality and space, and household assets, in order to rank the states and cities according to the degree of social backwardness at a given moment in time.

Table 4. Access to Technologies, 2020.

Type	Percentage
Radio	17%
TV	22%
Computer, laptop, or tablet	5%
Landline	8%
Cell phone	21%
Internet	11%
No television or radio	1.4%
No landline or cell phone	1.3%
No computer and internet	13%
No information and communication technology (ICT)	0.3%

Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.

### 7.3.5.2. Utilities

Regarding housing and public services (utilities), there are 757 inhabited homes, most of which have electricity, piped water, and sewage. However, there are 16 houses that do not have sewage and 8 houses that do not have piped water (Table 5).

Table 5. Inhabited Houses and Public Services, 2020.

Inhabited Houses and Utilities	No.
Total housing units	757
Inhabited houses	651
Uninhabited dwellings	96
Temporary houses	9
Dwellings with electric power	648
Dwellings with piped water supply	642
Homes that do not have piped water	8
Dwellings with drainage	634
Dwellings without drainage	16
Overcrowded houses	40

Source: Own elaboration based on the Census Information Consultation System (SCINCE), 2020.