



REIMAGINA
Puerto Rico



COMMUNITIES TOGETHER



A GUIDE FOR RESILIENT COMMUNITY
CENTER DESIGN IN ISLAND COMMUNITIES



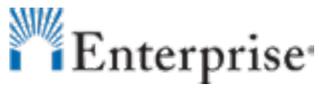
Disclaimer for COMMUNITIES TOGETHER: A Guide for Resilient
Community Center Design in Island Communities

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REIMAGINA
Puerto Rico



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FROM THE AUTHORS

Hurricane María taught us many lessons. Some of these lessons were learned in the midst of the devastation, others, once there was more calm and we managed to gain some perspective on the magnitude of damages, where preparation failed, and how the response would have been if communities had been more organized and prepared. However, the most important lesson María taught was the manifestation of resilience of each Puerto Rican and the communities that rose together.

The Resilient Community Center guide emerges as response to the need to design community centers with the capacity to face climate, social and economic changes. And at the same time, serve as community educational and socio-economic development centers throughout the year. This duality of being prepared for an emergency, but also being relevant and active throughout the year, is of great importance to ensure, year after year, the community increases its organizational capacity to make positive changes.

This guide is an expansion to the Community Engagement chapter published in 'Keep Safe, A Guide for Resilient Housing Design in Island Communities'. The main authors of this expansion guide have contributed diverse perspectives and knowledge to achieve robust and relevant content without being long or very complicated. The purpose is to make the guide accessible to all, including community members and community leaders. We are very grateful to the group of advisors who through the process provided clarity and strategic value.

It is with pride and humility that we present this guide to Puerto Rico, with the hope of a resilient future!

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An organization that stands for the rights of all to have access to affordable, safe and quality housing.

- Laurie Schoeman, Director

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Relmagina is a locally-led initiative that works toward a coordinated reconstruction of Puerto Rico. In the aftermath of Hurricanes Irma and Maria, Relmagina devised recommendations and principles to rebuild a strong, equitable and prosperous Puerto Rico with the input of local residents and stakeholders. Relmagina is fostering the implementation of these recommendations by forming multi-stakeholder coalitions, tracking progress and providing tools to advance Puerto Rico's rebuilding efforts. Nonpartisan and independent, Relmagina evolved from the Resilient Puerto Rico Advisory Commission to a program of the Center of a New Economy.

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Perkins and Will is a global design firm with a goal to design places that make a positive difference in the world.

resilientSEE is a non-profit organization that connects the design professions, academia, and research institutions, and supports innovative research to improve the built environment, and by extension, the lives of its inhabitants.

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resilientSEE - PR collaborator / Design Ed 4 Resilience

Design thinking to empower students to heal from disasters, to innovate climate solutions, and to create more equitable, sustainable, enterprising and resilient communities.

Special credit to the Resilient Communities Design Lab Students at Francisco Manrique Cabrera School, Bayamón.

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DEFINING A RESILIENT COMMUNITY CENTER

“PERSONAL SURVIVAL IS NOT ENOUGH, IT MUST BE COMMUNITY BASED” - DR. FERNANDO ABRUÑA

Barrio Ingenio Community Center / Asociación de Comunidades Unidas Tomando Acción Solidaria, Toa Baja. Image courtesy of resilientSEE. Photo by: Atmospha Films, Inc.



WHAT IS RESILIENCE?

It is the capacity of individuals, a community or system of any scale to survive, adapt, recover and grow despite vulnerabilities, chronic stresses and acute shocks¹. Vulnerabilities and risks can range from environmental or climate related hazards to intrinsic characteristics of the geographical location, such as earthquakes and hurricanes. They can also be social or economic.

Resilience enhancement is a continuous and dynamic process. It is a characteristic found in all individuals, groups, organizations, institutions and even governance systems. In some cases, resilience could be more adequately formed when one of these systems is dismantled in order to give way to a more sustainable future. This became evident after Hurricane Maria and continues to manifest itself as Puerto Rico rebuilds. Communities need to develop tools, strategies and resources to confront hazards, whether societal or caused by climate change.

Communities should also consider slow threats and hazards. While this is harder to measure and varies more from place to place, most of the time, the community is not reacting to a sudden shock. For example, communities could experience a drop off in event or meeting attendance as people perceive that things are "back to normal." But normal is not necessarily resilient. To build real sustainable and resilient capacity, these slower community threats need to be addressed year-round. Successful resilient communities build resilience when they are actively working to enhance community problem-solving, multi-generational trust and communication, hygiene, health, food and water security, innovation and entrepreneurship. Community resilience begins at an individual level with a mindset, a sense of empowerment that binds members together toward common goals.

WHAT IS A RESILIENT COMMUNITY HUB?

The value of a Resilient Community Hub² is to provide an anchor in the community where members feel a strong sense of belonging and ownership, a place where they can chart their shared future. Successful examples come in all shapes and forms. A Community Center should not feel the pressure to be or do everything. Instead communities should consider working with NonProfit Organizations (NGOs) and other entities to identify areas of collaboration. Ultimately, a Resilient Community Hub should reflect the DNA of the community, the context in which they are and the needs they need to fulfill.

We define a Resilient Community Hub as an existing or new space, where educational and/or social services are provided regularly throughout the year to the community, yet the facility is ready to withstand emergencies and serve the community in times of need. The most important components of a Community Resilient Hub are:

- Community Capacity: Community leaders and members engaged in the co-development to form and manage the community association, secure their long-term sustainability, and coordinate resources; and it is a registered social purpose non-profit entity or has a fiscal sponsor to allow external funds.
- Community Programs: Support community needs by providing a space for gathering, enhancing connectivity, and offering educational, economic and social services and programs.
- Community Gardens: Localized farming projects for community consumption and/ or support small farmers in the community.
- Accessible and Safe Site: A well-used/ trusted site or building, in fairly good condition that can support critical elements such as solar and energy storage systems. The location should be accessible to all, located away from high hazard areas (flood, landslide) and has safety guidelines for employees and community members.
- Sustainable Energy: Solar power system with batteries and backup generator; onsite power systems should be capable of reliably sustaining operations during an extended power outage.
- Trusted Communications: Back-up communications system to have access to news and information before, during and after an emergency.
- Access to Water and Supplies: Potable water storage / cistern for basic operational needs, and capacity for refrigeration, charging stations, basic medical supplies, and other supplies needed in case of emergency.
- Emergency preparation plan: Plan to prepare and support community members before, during and after an emergency.

¹ There are several organizations that have defined resilience. We have been influenced by the thought leadership of 100 Resilient Cities, no longer active, and more recently by Adrienne Arsht-Rockefeller Foundation Resilience Center.

² In this guide, the term Resilient Community Hub and Resilient Community Center are used interchangeably.

DEFINING A RESILIENT COMMUNITY CENTER

Comité de Desarrollo Social y Cultural de Daguao, Naguabo. Image courtesy of resilientSEE. Photo by: María Roldán



WHY THIS GUIDE?

As individuals, we have different needs that are quickly prioritized in times of emergency. This guide aims to:

- Discern individual and community needs that a Community Resilient Hub could provide, year round and in times of emergency, in the form of services, or educational resources.
- Offer strategies to enhance the community preparedness level before, during and after emergency disruptions.
- Provide an approach to maximize space and program offerings at the service of the community.
- Highlight the physical design aspects and building infrastructure elements essential to withstand chronic stresses and acute shocks.

WHO BENEFITS FROM THIS GUIDE?

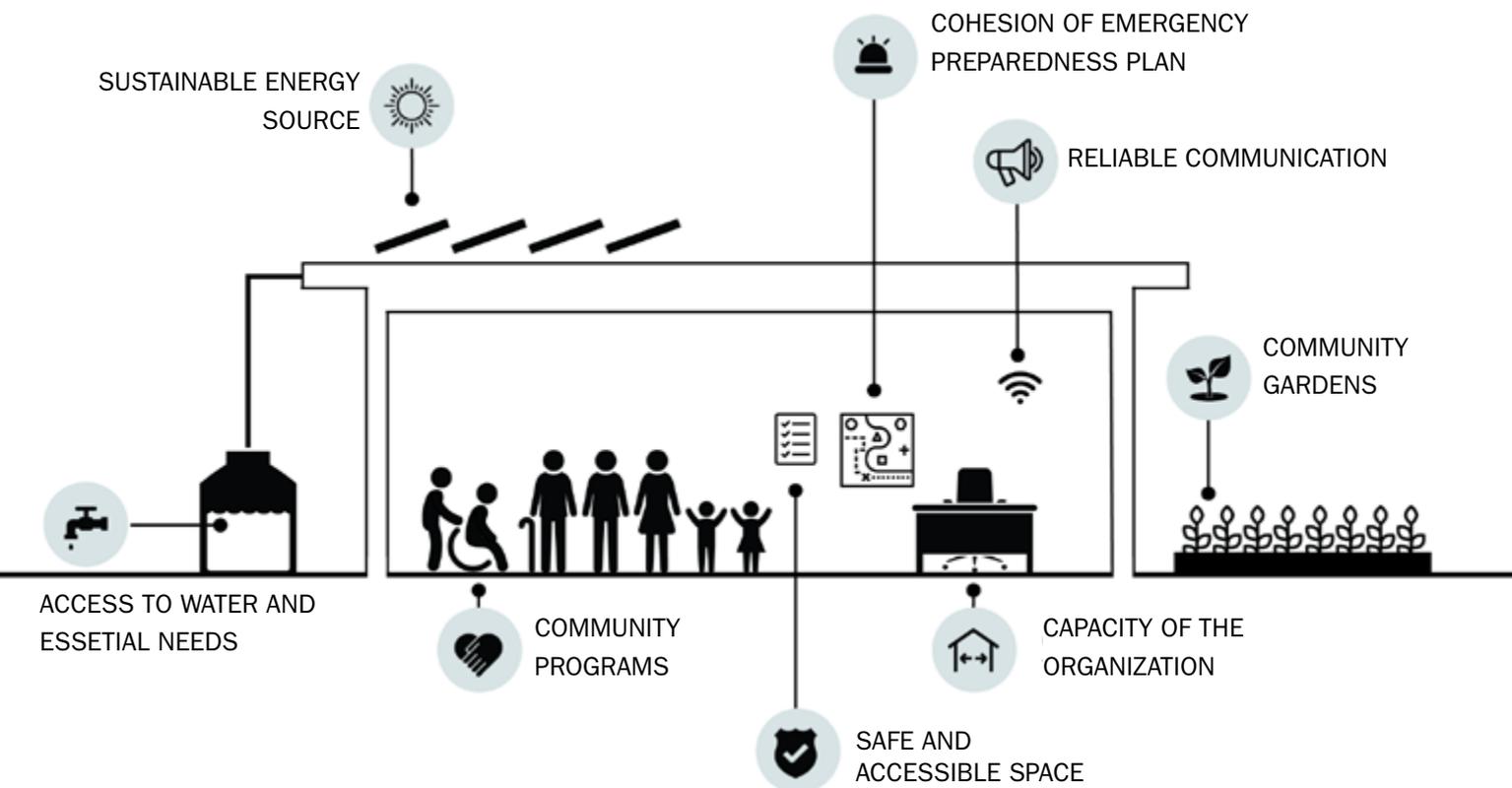
Community leaders seeking to improve organizational capacity, services and programs to the community and robustness of their facilities; individuals interested in being active participants in their community centers and looking to increase readiness or capacity for climate change threats; and, the people who come to offer relief or provide services to the community, like neighboring community leaders, first responders, healthcare providers, insurers.

WHAT IS IN THIS GUIDE?

Part 1: Community Organization: Identifies vulnerabilities and risks (for example, wind, flood, heat exposure, earthquake); and identifies community needs given demographics, location and special circumstances, such as health conditions among community members.

Part 2: Operating a Resilient Community Center: Assumes the organizational capacity of the community is established, including understanding of operational cost and resources needed, focuses on programmatic ideas to support the community year round and in times of emergency.

Part 3: Physical Assets to Support a Resilient Community Center: Identifies strategies to increase the robustness of physical aspects, including building systems; highlights passive design strategies such as favorable solar or wind orientation to enable passive survivability.





PART 1

COMMUNITY

ORGANIZATION

Suggested components to organize
the community

Image courtesy of Comité de
Desarrollo Social y Cultural de
Daguao, Inc. Naguabo. Photo by:
María Roldán

COMMUNITY ORGANIZATION

RISKS AND VULNERABILITIES

Every community has a distinct set of risks and vulnerabilities ranging from social, environmental and economical. To identify and prioritize those risks and vulnerabilities it is important to host open dialogues and engage community members of all ages in the creation of community profile maps that outlines a vulnerability framework. This framework could serve as a base to develop preparedness plans so the community is ready to bounce back from acute shocks and can address chronic stress.



Community Mapping, *Asociación de Comunidades Unidas Tomando Acción Solidaria*, Toa Baja. Photo by: Waldemiro Vélez Soto



Community mapping, *Comité de Desarrollo Social y Cultural de Dagua, Inc.* Naguabo. Photo by: María Roldán

RESOURCES:

For more community organization resources, please reference the COMMUNITY ENGAGEMENT : Prepare for Action Together chapter of *Keep Safe: A Guide for Resilient Housing Design in Island Communities*.

Other organizational resources include:

- <https://www.shareable.net/the-resilience-we-want/>
- <http://recola.org/initiatives/recovery-in-a-box/>
- <https://www.shareable.net/the-response/>

1. CREATE COMMUNITY PROFILE AND MAP

- Community Organization (committees).
- Neighbor Directory.
- Housing Census Map:
Occupied and non-occupied houses, family composition, houses in high risk due to construction conditions.
- Natural Environment.
- Socio-Economic Community Map:
Total population; Household with Income <19K¹, Dependent Population; Educational Attainment.
- Natural Disasters Record.
- Medical Necessities Map:
Identify specific medical needs of people with physical or mental conditions.

¹ <https://datausa.io/profile/geo/puerto-rico/>

2. VULNERABILITY FRAMEWORK

- Identify Site Hazards:
Atmospheric hazards: high winds, drought, fire, extreme temperatures.
Hydrological hazards: heavy rainfall, storm surge, tsunami.
Geologic hazards: landslide, coastal erosion, liquefaction, subsidence.
- Sensitivity:
See socio-economic map
Identify resulting vulnerabilities.
- Capacity:
Establish an emergency response committee
Design a communication and distribution plan to boost community readiness.
Identify emergency response resources (trucks, materials, houses with generators).

Seek technical expertise when necessary

3. HOST COMMUNITY MEETINGS

- Create committees.
- Provide an opportunity for conversation and announcements.
- Periodic social events to boost visibility, participation and community visioning.
- Create an agenda with clear priorities and desired outcomes.
- At the end of the meeting, call for a shared applause.

4. DEVELOP PLANS FOR...

- Emergency Preparedness Plans and Mapping of Community Risks.
- Evacuation: Partial and total evacuation.
- First Aid: Physical & Mental Health, chronic issues.
- Communication.
- Access to Transportation, Fuel, food and water.
- Energy Disruption / Power alternatives.
- Sewage Management.
- Temporary Shelter.
- Recovery and Aid Distribution.

COMMUNITY ORGANIZATION

NON-EMERGENCY ACTIVITIES

During non-emergency times, the role of a Community Hub should reflect community needs and provide spaces and services for a range of activities, such as to become a social incubator with an integrated solutions curriculum to educate and empower community members. A community might begin with limited program activities and continue to expand the offerings over time. Periodic community events to boost visibility, participation and community visioning exercises and gatherings will help build stronger connections among individuals. Successful case studies include programs featured in this document.



Comité de Desarrollo Social y Cultural de Dagua, Inc. Naguabo. Photo by: María Roldán

ADMINISTRATIVE ORGANIZATION

Partnerships Outreach Program: The Hub could build internal and external community capacity becoming a place for community members to meet with facilitators to address challenges and find solutions through strong partnerships with institutions, organizations and agencies inside and outside the community.

- Create a relationship map illustrating partnerships with different groups and identify roles of each one.
- Identify diverse resources of funding to cover administrative and programmatic expertise. This includes negotiating with municipal administrations to cover some of the costs.
- Identify operational redundancy and opportunities for worksharing through alliances to reduce administrative costs.

COMMUNITY GARDENS

Educational EcoAgriculture practices:

- Agricultural Educational classes: developing productive gardens with coaching from an agronomist.
- Farm to Table Program.
- Scalable Agricultural production: for Community Center consumption / for residents / for sale and small businesses.
- Recycling and Composting orientation sessions.

WELLNESS PROGRAMS

- **Sports & Recreation:** children playground, fitness room, yoga, outdoor gym, intramural sports programming (basketball courts baseball).
- **Physical / Mental Health fairs,** clinics or education.
- Community Laundromat and / or Showers.
- **Extreme Heat Cooling Stations:** mist tents or water jets, air conditioned spaces, water hydrating stations.

ECONOMIC DEVELOPMENT PROGRAMS

- **Community-based entrepreneurship.**
- **Public Innovation Space:** community makerspace for collaborative projects among community members or with private sector / educational institutions.
- **Revenue Generating Spaces:** Multipurpose Room rented for events, space for retail / commercial use.
- **Elderly Care / Support Services:** for elderly and people with special needs.

CULTURAL PROGRAMS

A variety of cultural programs could be hosted indoor or outdoor to enrich the community experience:

- **Arts and Craft.**
- **Music and Dance:** such as rehearsal room with temporary or permanent stage, flexible furniture.
- **Community Theater.**
- **Cooking Together.**
- **Community Cinema.**
- **Annual Festivals or Fairs** that are also a form of economic development for community members.
- **Community History Museum.**

EDUCATIONAL PROGRAMS

The Community Center could be a collaborative, innovative makerspace, where co-working, incubation and inspiration across generations and disciplines is possible. It could be a place that integrates an educational "curriculum" based on community needs, uses design thinking and efficacy building for community problem solving, and enables upskilling and reskilling of individuals.

- **Early Childhood / Youth / Adult Education:** mixing cross generations for trust building and innovation.
- **Tutoring Programs / Supervised Studies.**
- **Design Thinking / Problem-Solving Educational Programs:** Facilitators work with community to address real challenges, and find and implement solutions.
- **Water Consumption and Preservation Education**
- **Disaster Emergency Preparedness Program:** enhancement of community capacity.
- **Elderly and multi-generational Activity Programs:** building trust and monitoring mental / physical health.
- **Computer Lab / Technology Center.**
- **Youth Violence, Drugs / Alcohol Abuse Prevention Program.**
- **Community Library / Literacy Programs.**





PART 2

OPERATING A RESILIENT COMMUNITY CENTER

Year-round programs for community building and education, and pre, during, and after emergency considerations

Students from the Resilient Communities Design Lab at the Francisco Manrique Cabrera School, Bayamón, pitching their Resilient Community Hub ideas to Enid Reyes.

Image courtesy of Maggie Favretti, Design Ed 4 Resilience, Founder and Director

OPERATING A RESILIENT COMMUNITY CENTER

EMERGENCY



Martorel Fisherman Community, Yabucoa. Photo by: Yanel de Angel

DAYS PRE-EMERGENCY

- **Prepare for the event** / preparation should be heightened once official event alert is announced by authorities.
- Obtain basic food, water and medicine supplies for distribution after event.
- **Coordinate with Municipal / State Authority when possible.** The Community Hub could be an extension of official emergency services. During non-emergency times, the community leaders and volunteers should be trained for emergency response.

DAYS DURING EMERGENCY

- **Withstand the event** in a safe location with necessary provisions.
- Provide guidance via buddy system, sirens or flashing lights regarding whether it is safe to transfer from the home to a safe shelter.

DAYS AFTER EMERGENCY

- Recover from the event / support local authorities in extending services and resources to the community.
- Assess damage, quantify resources or support needed through visit to vulnerable areas; clean streets for road access.
- Put your plan into action.

RESOURCES:

NMEAD - Negociado de Manejo de Emergencia y Administracion de Desastres. Phone: 787-724-0124 manejodeemergencias.pr.gov

FEMA - Consult Taking Shelter from the Storm: Building a Safe Room for your Home or Small Business. <https://www.fema.gov/>



COMMUNICATION

DAYS PRE-EMERGENCY

GOVERNMENT

Check in with FEMA, NMEAD

NOTICES AND

(Negociado de Manejo de

COMMUNITY LOCAL

Emergencia y Administración de

CONDITIONS

Desastres), Municipal Emergency

Management Office (OME), local

authorities or first responders to

review pre-disaster emergency

preparedness plans, and establish

a collaborative agreement with

NMEAD for community distribution.

DAYS DURING EMERGENCY

Listen to radio, document

conditions or special situations

that authorities might need to

know.

Provide communication within

community members and keep

them informed.

DAYS AFTER EMERGENCY

Reach out to first responders,

establish communication with

outside world (radio, news, social

media).

Maintain communication with

community members.

Reach out to pre-established

contacts to provide them with

information about need and

access.

COMMUNITY

Communicate plans or protocols in

COMMUNICATION

social media, use loud speakers to

PLAN

notify those not in social media.

Echo emergency plans messages

from authorities.

Keep interval community updates

to keep people informed of

situations around them.

Keep communication in aftermath

for community connectivity and to

accelerate recovery.

Serve as back-up communications

resource for community members

to communicate with their family.



TEMPORARY SHELTER

DAYS PRE-EMERGENCY

REACT TO

Keep track of evacuation notices.

EVACUATION

Understand which members of

NOTICES

the community will need shelter

in place, seek shelter with other

family members or mobilize to an

official shelter.

DAYS DURING EMERGENCY

Shelter in place.

DAYS AFTER EMERGENCY

Identify plan for those who can

safely return to their home and

those displaced.

OPERATING A RESILIENT COMMUNITY CENTER

EMERGENCY



FIRST AID

DAYS PRE-EMERGENCY

FIRST AID KIT

Procure medication or equipment needed based on community profile. There are several First Aid Kit levels depending on preparation of those providing medical aid. Verify expiration date and completeness of first aid kit inventory.

DAYS DURING EMERGENCY

If the prognosis of getting more medical equipment or medications is not good, consider sending an SOS to authorities or organizations that can help.

DAYS AFTER EMERGENCY

Replenish first aid kit.

MEDICAL ATTENTION

Store tents that could become temporary and mobile first aid clinics.

Keep interval community updates to maintain people informed of situations around them in case they need sudden access to medical attention.

Evaluate community members based on community profile database and make sure everyone's medical needs are met. Provide power for medical equipment or refrigeration for medications for those who need it and access to mental healthcare.

PREPARE A FIRST RESPONDER AID KIT FOR APPROXIMATELY \$150

- | | | | |
|------------------------|--------------------------------|-------------------------------------|----------------------------------|
| - Tweezers | - 4" x 4" Gauze Pads (50) | - 8" x 10" ABD Pad (2) | - Triangle Bandage (2) |
| - Kelly Hemostats | - 2" Roll Gauze (2) | - 1" Roll Cloth Tape | - Eye Wash Irrigation Solution |
| - Trauma Sheers | - 3" Roll Gauze (2) | - Iodine Wipes (10) | - Black Nitrile Gloves (2 Pairs) |
| - Bandage Sheers | - 4" Roll Gauze (2) | - Isopropyl Alcohol Wipes (10) | - Universal SAM Finger Splint |
| - Penlight | - 2" Self-Adherent Bandage (2) | - Triple Antibiotic Ointment 1/2 oz | - Oral Glucose Gel |
| - Ammonia Ampules (10) | - 2" Elastic Bandage (2) | - Instant Cold Packs (2) | - Sting & Bite Relief Pads (10) |
| - Band-Aids (100) | - 5" x 9" ABD Pad (2) | - Eye Pads (2) | - First Aid Guide Booklet |
| | | | - 4" X 4" Burn Gel Dressing (2) |

UTILITIES

POWER



DAYS PRE-EMERGENCY

Stock batteries, disconnect appliances and equipment.

Protect gas tanks, secure solar panels or small scale wind turbines.

Ensure that either battery storage or generators have supply for maximum storage capacity.

Identify critical vs ideal loads and set up a rationing plan.

DAYS DURING EMERGENCY

Stay clear of power sources.

Implement rationing plan for post-emergency recovery.

DAYS AFTER EMERGENCY

Replenish battery supply, gas and reinstall solar panels or other power sources.

Replenish power storage.

Continue implementing rationing plan if recovery will be prolonged.

SEWAGE



Store water for toilet flushing, 3 gallons per person per day is recommended. Consider installation of composting toilets as a permanent passive system. Have an alternative system - bucket system, and keep clean.

Minimize toilet flushing.

Inspect toilet hygiene.

OPERATING A RESILIENT COMMUNITY CENTER

EMERGENCY



ACCESS

	DAYS PRE-EMERGENCY	DAYS DURING EMERGENCY	DAYS AFTER EMERGENCY
<p>▶</p> <p>TRANSPORTATION</p>	<p>Verify emergency routes established in emergency plan are clear and accessible. Ensure volunteered civilian vehicles or bikes are available and equipped. If area floods, consider coordination of available kayaks and boats.</p>	<p>Avoid leaving the premises.</p>	<p>Coordinate with authorities who are in charge of road accessibility and itinerary. Designate a group of volunteers to clear access to roads, and entrance to Community Center. Carpool and plan trips in advance. Execute plan after emergency.</p>
<p>▶</p> <p>GASOLINE</p>	<p>Agree on gasoline reserve and store to withstand storm and aftermath. Establish a group to buy and stock gasoline for community to avoid congestion at the gas stations .</p>	<p>Ensure gasoline is away from potential hazards (flammable).</p>	<p>Prioritize best use of gasoline (emergency transportation, generator for medical needs).</p>



NUTRITION

DAYS PRE-EMERGENCY

DAYS DURING EMERGENCY

DAYS AFTER EMERGENCY

FOOD

Stock food bank with non-perishable food with at least 3 days of food per person sheltering in place. Identify dietary restrictions and allergies.

Consider stocking the food bank for community members beyond those operating the Community Center.

If the Community Center will play the role of a Community Kitchen, volunteers should make a list of equipment and materials needed, such as a temporary tent (in case kitchen is not within the building), grills, cutlery and hygiene strategy.

Consider rationing food if necessary.

Replenish food bank and consider alternative sources of nutrition in case certain items are not available. Community Center could become a distribution center for water and food provided by FEMA, PREMA, and/or other sources or entities. This should be coordinated in advance as part of partnerships with other organizations and authorities. Reach out to pre-arranged list of supporting agencies and NGOs with information about needs.

WATER

Fill in water tanks, cisterns, identify potable vs. non-potable sources.

Rule of thumb is 1 gallon of potable water per person per day.

Restrict use of water for non-essential use.

Replenish water, only drink from safe sources (filtered or sanitized).





PART 3

PHYSICAL ASSETS OF A RESILIENT COMMUNITY CENTER



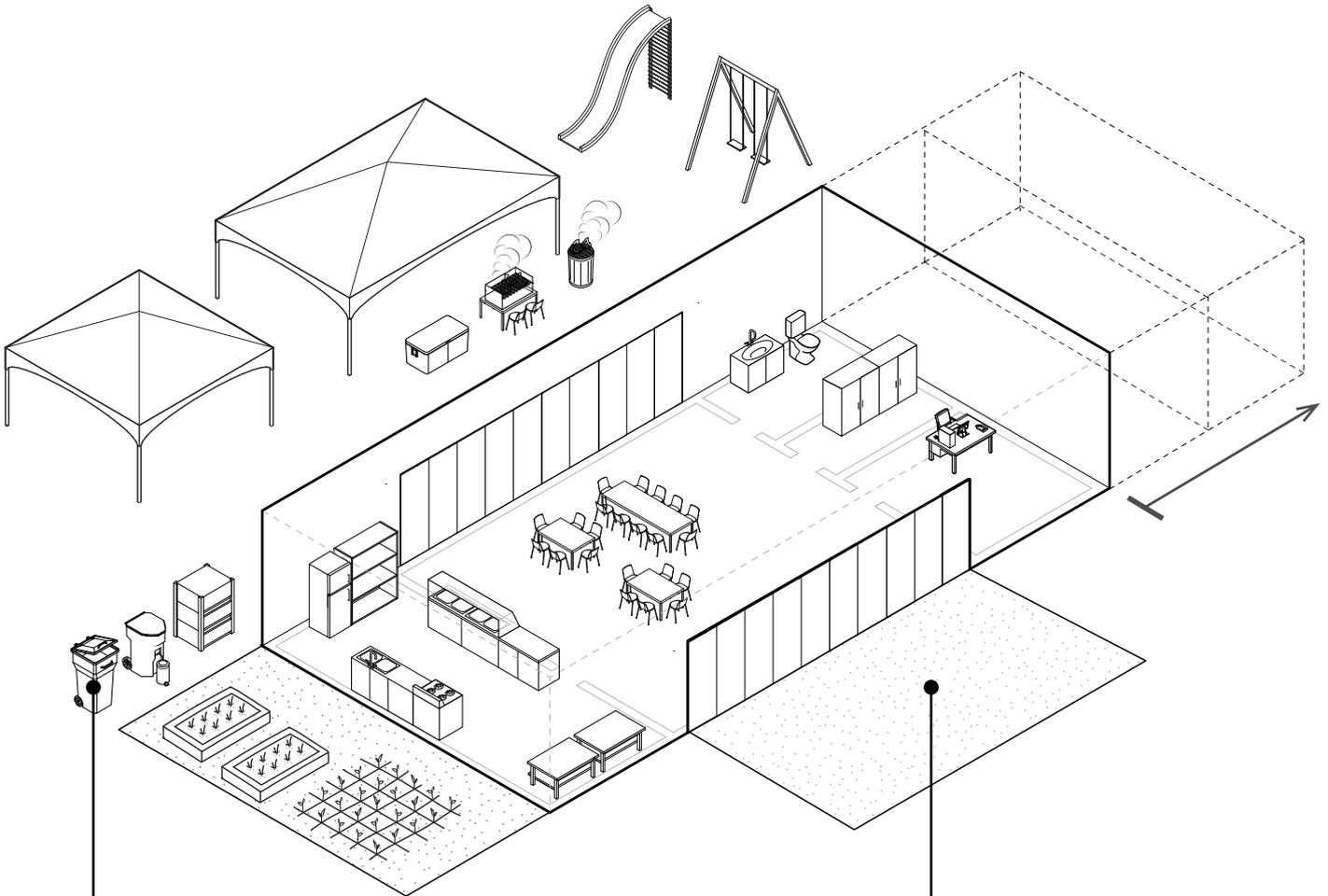
Specifications, systems and fixtures
to create resilience



Image courtesy of Reimagina.
Photo by: Alicia Díaz

PHYSICAL ASSETS OF A RESILIENT COMMUNITY CENTER

PROGRAM



WASTE

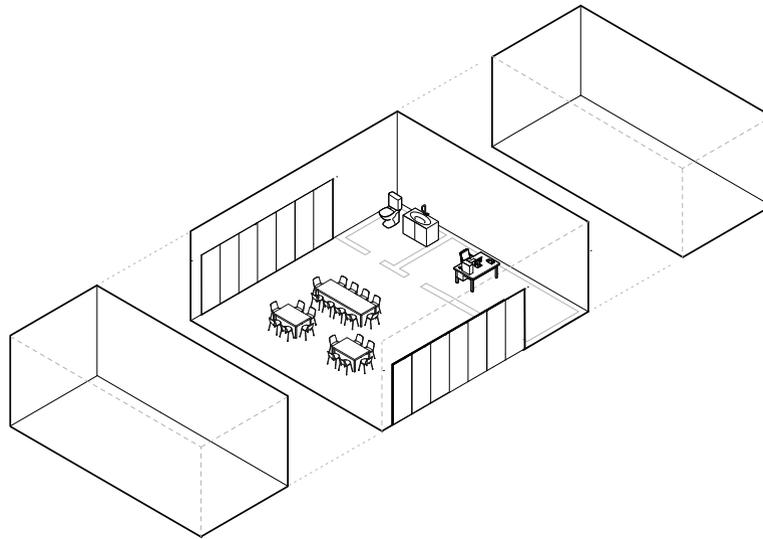
Consider installing composting toilets as a permanent sanitary solution. Composting toilets do not require flushing and must be sized adequately. For other waste management, consider implementing recycle, reuse or composting programs as good practices or as part of a cycling economic model.

AREA FOR DISTRIBUTION

Emergency Supplies.

Designate a loading area for emergency supply drop-off and distribution.

Mass distribution of food and non-food items should be a consideration for population control.



SPACES

- Community Multipurpose Room
 - Main meeting room, (40-100 people), AC, flexible, to host recreational and cultural programs.
- Administration.
- Kitchen.
- Bathrooms.
- Office Work Space.
- Conference Room.
- Print Area.
- Storage/Maintenance/Repairs.
- Laundry area.
- Showers with hot water.

PERMANENT

Designated space with an audio system, projector and projection screen, flexible furniture (podium and chairs on wheels, foldable tables). Consider providing gender neutral / family restrooms.

- Cooking range / stove, refrigerators / freezers, sinks (sanitation/dishes), microwave oven, dry storage, supply storage, food preparation surfaces.

- Administrative space with office equipment.
- Storage and repair rooms with adequate shelving.

TEMPORARY

Find an open space, Example: basketball court, park, parking lot
 Portable storage.
 Chalkboard.
 Sit on the ground, beach chairs.
 Porta Potty.

- Improvised-Tent, gas tanks/ stove, charcoal pit.

- Tents, portable office supplies, mobile printers, portable storage.

PHYSICAL ASSETS OF A RESILIENT COMMUNITY CENTER

SYSTEMS

COMMUNICATIONS

- KP4.
- Satellite Phone.
- Loudspeaker.
- Wifi / Data Access for Social Media/ community bandwidth access for communication.
- Community-based radio station.
- Analogue telephone life.
- GoTenna Mesh system- allows texting and GPS without Internet.

STRUCTURAL

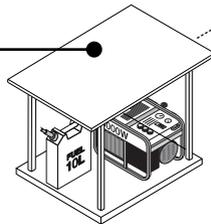
A professional structural engineer should be consulted to verify the building meets code requirements for seismic movement. Depending on location, ensure the structure can withstand forces caused by storm surge produced by hurricane or tsunami events.

ENERGY STORAGE

Design a holistic system, that includes batteries for storing energy. Ensure that basic needs like ventilation, emergency lighting, and electricity for essential equipment is connected.

ENERGY GENERATOR

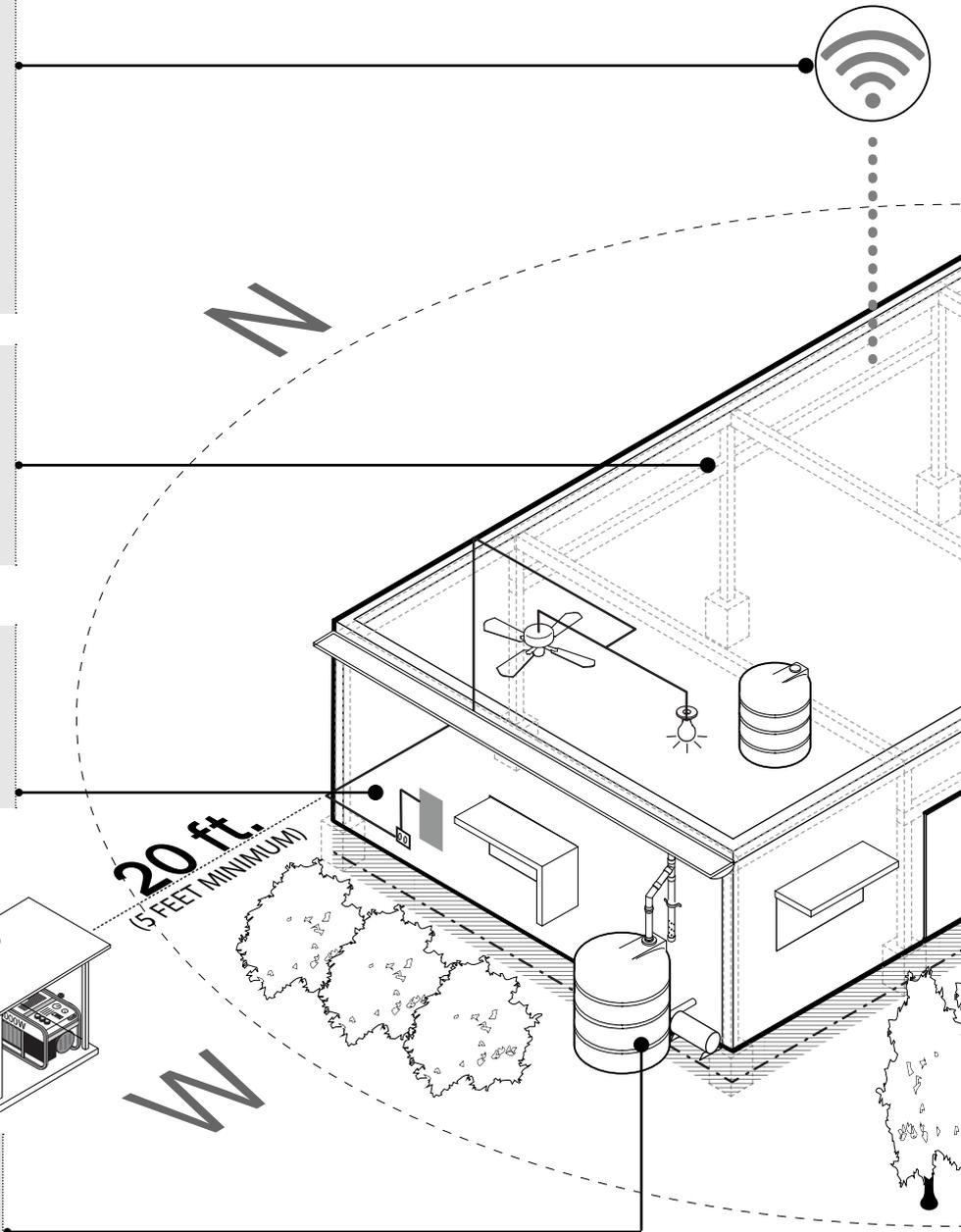
Have a backup energy generator for emergencies. Ensure that the generator is placed outdoors, at least 20ft from the structure, and is protected from debris.



RAINWATER COLLECTION

Install a rainwater collection system for non-potable water use, such as irrigation, flushing toilets and cleaning. If purified, water can be used for drinking.

Rainwater storage tank could be located on the roof or ground.



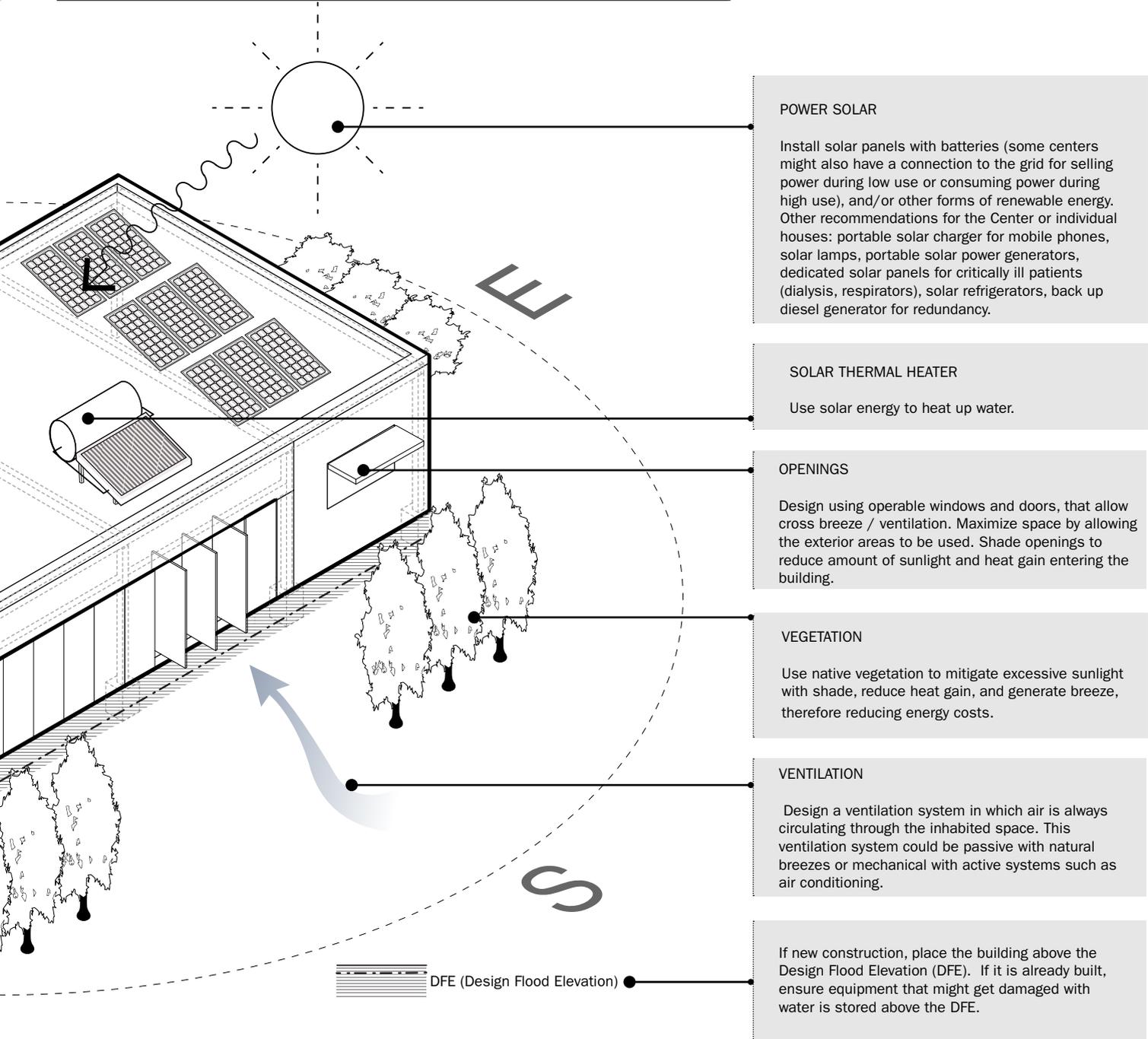
THINGS TO BE AWARE OF WHEN ADAPTING A BUILDING:

- | | |
|----------------------------------|-----------------------------------|
| Siting Risks | Natural hazards and Vulnerability |
| Maintenance needs/costs | Road Safety / Accessibility |
| Ecologically Sensitive land | Fire Safety |
| Wastewater Disposal | Building Capacity |
| Building Materials | Water Quality |
| Quality of Construction | Mold/Toxins |
| Roof Construction-Hurricane Ties | Site Drainage |
| Ventilation and Fresh Air | |

RESOURCES:

Puerto Rico Energy Toolkit: <https://prenergytoolkit.com>
 Created by Resilient Power Puerto Rico & Rocky Mountain Institute

Refer to The Sphere Handbook: Humanitarian Chapter and Minimum Standards in Humanitarian Response (<https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf>)



POWER SOLAR

Install solar panels with batteries (some centers might also have a connection to the grid for selling power during low use or consuming power during high use), and/or other forms of renewable energy. Other recommendations for the Center or individual houses: portable solar charger for mobile phones, solar lamps, portable solar power generators, dedicated solar panels for critically ill patients (dialysis, respirators), solar refrigerators, back up diesel generator for redundancy.

SOLAR THERMAL HEATER

Use solar energy to heat up water.

OPENINGS

Design using operable windows and doors, that allow cross breeze / ventilation. Maximize space by allowing the exterior areas to be used. Shade openings to reduce amount of sunlight and heat gain entering the building.

VEGETATION

Use native vegetation to mitigate excessive sunlight with shade, reduce heat gain, and generate breeze, therefore reducing energy costs.

VENTILATION

Design a ventilation system in which air is always circulating through the inhabited space. This ventilation system could be passive with natural breezes or mechanical with active systems such as air conditioning.

 DFE (Design Flood Elevation)

If new construction, place the building above the Design Flood Elevation (DFE). If it is already built, ensure equipment that might get damaged with water is stored above the DFE.





Fe Que Transforma, Vieques.

PART 4

COMMUNITY CASE

STUDIES

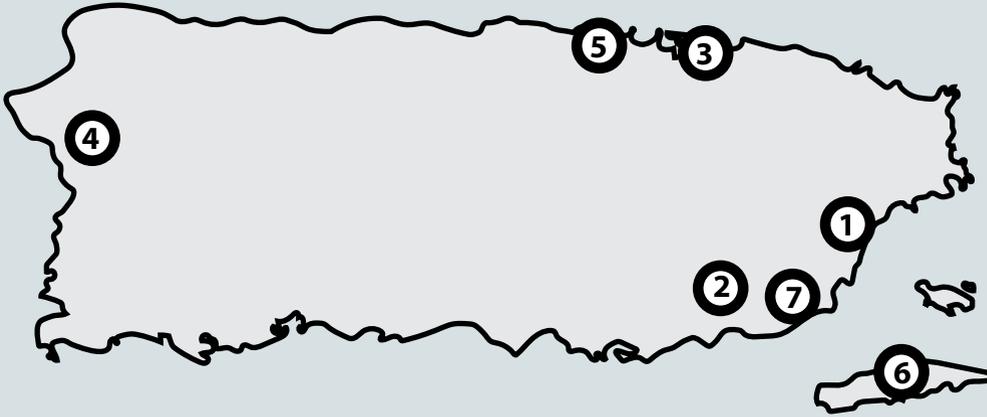
Photo by: Shari Studio
Photgraphy

Resilient success stories



COMMUNITY CASE STUDIES

INTRODUCTION



- 1- C.D.S.C. DAGUAO - NAGUABO
- 2. CENTRO GUPE - PATILLAS
- 3. G8, CAÑO MARTÍN PEÑA - SAN JUAN
- 4. C.C.C. - CORCOVADA - ANASCO
- 5. ACUTAS - TOA BAJA
- 6. FE QUE TRANSFORMA - VIEQUES
- 7. P.E.C.E.S. - HUMACAO

	DAGUAO	GUPE	G8	CORCOVADA	ACUTAS	FE QUE TRANSFORMA	PE.C.E.S
COMMUNITY CAPACITY	●	●	●	●	●	●	●
COMMUNITY PROGRAMS	●	●	●	●	●	●	●
COMMUNITY GARDENS	●	●	●	○		●	●
SAFE AND ACCESSIBLE SPACES	●	●	○	○	●	●	●
SUSTAINABLE ENERGY	●	●	●	○		●	●
ACCESS TO WATER AND BASIC NEEDS	●	●		●		●	●
TRUSTED COMMUNICATIONS	●	●			○	●	●
EMERGENCY PREPAREDNESS PLAN	●	●			○	●	●

In Part 4 of this guide we present case studies of existing community centers throughout the island post-hurricane María. These centers and communities were selected as they contain representative examples of the resilient essential elements identified in this guide for a Resilient Community Hub. Resilient Community Hubs should meet the unique needs of the community, supported with a strong organizational capacity, emergency preparedness plans, redundant or back-up communications, water and power (focused on renewable energy) services in order to adequately serve the community in times of need. Therefore, the case studies highlight the level of community organization, and operational and physical aspects of each Community Hub presented.

After the impact of hurricanes Irma and María in October of 2017, and having suffered the longest power outage in U.S. history, Puerto Rico realized we needed to be more resilient as a whole, not depend on the government, and develop resilient community centers or hubs to offer a space for disaster relief services and ongoing provision of resources for communities.

Shortly after hurricane María, various local and U.S. based non-profit organizations commenced contributing resources to existing community organizations to help them develop resilient community hubs¹. Some of these organizations included Mercy Corps., resilientSEE-PR, Resilient Power Puerto Rico, Para la Naturaleza, American RedCross, and Fundación Comunitaria de Puerto Rico among others.

First, we present the case study of *Comité Desarrollo Social y Cultural Dagua, Inc.*, which exemplify completely resilient community hubs, a hub that should be emulated by others since it incorporates all of the resiliency elements. The case study of *G8/Fideicomiso de la Tierra del Caño Martín Peña*, presents very strong community organizations that have developed resilient renewable energy systems and other resilient elements within their centers, yet are still developing or working on expanding physical assets of their centers to become fully resilient.

The Corcovada community in Añasco is a very interesting case study. They were organized 52 years ago when they were in need of developing their own community aqueduct, since they lacked water service from the utility (AAA). They developed, operate and manage the first community aqueduct developed in Puerto Rico, which today is completely resilient with solar panels and batteries for operation of aqueduct. The *Barrio Ingenio/ACUTAS* community organization was formed after Hurricane María and just recently obtained control of a community center. They have demonstrated great resiliency in their actions to date and plan to incorporate resiliency elements in their plans for the future.

Fe Que Transforma is another completely resilient community hub example and should be emulated. They have given kids classes on resilience; and they functioned as primary service point for the people of Vieques after the impact of María. P.E.C.E.S. was a central and important location and organization for the Punta Santiago community in surviving the impacts of Hurricane María and now it has great plans to develop from scratch a Resilient Community Hub that incorporate all the resiliency elements noted in this guide.

We hope these case studies depict what is achievable, and options and resources available on how to go about becoming a Resilient Community Hub.

RESOURCE:

In addition to NGOs support, Puerto Rico will also soon have access to \$75,000,000 Community Development Block Grant – Disaster Recovery (CDBG-DR) funds, under the Community Resilience Centers Program (<http://www.cdbg-dr.pr.gov/programas/>), for the development of Resilient Community Hubs.

¹ Visit the Community Center case studies websites to learn more about NGOs that contributed to their resilient capacity.

COMITÉ DESARROLLO SOCIAL Y CULTURAL

DAGUAO, NAGUABO



"COMMUNITY SOCIAL SERVICE IS OUR ROOT"

Center: Organized since 1991. Building Rent / Owned since 2001. Community: 2,200 Inhabitants (Census 2010). 758 families in 738 parcels.

<http://www.comitedaguao.org>



Photo by: María Roldán

Resilient Elements

- **Community Capacity:** The community organization, Comité de Desarrollo Social y Cultural Dagua, Inc., operates the community center and has the 501(c)3 certification and very strong community leadership.
- **Sustainable Energy:** Solar panels and batteries covering conference room roof, as well as generators.
- **Dependable Communication:** Redundant communication system (GoTenna Mesh) and satellite phones.
- **Access to Water and Essential Provisions:** Water cisterns, refrigerators, first aid medicine and supplies, and tents for providing ambulatory medical services.
- **Emergency Preparedness Plan:** Emergency Preparedness & Management Plan, community mapping of risks, agreements with neighboring communities for emergency management, and CERT certifications.

Establishment and Organization of the Community Hub

Sixta Méndez Clara became interested in developing a Community Center in Dagua to meet the needs identified by social workers in 1987 and performed a study on the community. The study identified that the community did not have any parks, daycare services, libraries or recreational areas for the elderly. The committee, which has a 501(c)3 certification, was created to establish the community center in what used to be a community school that closed. By law enactment, they are owners of the land where the community center is located, approximately 3.5 acres. In addition, they rent some buildings to a Head Start Program and with that income they cover 90% of the budget to operate the community center.

After Hurricane María

- The community lost 100 residential units and the community sports courts were destroyed.
- They impacted positively their community and others

that needed help. They donated 5 emergency power generators.

- They connected with various NGOs that supported them with resources for: emergency preparedness plans, community mapping of risks, solar panel system, water cisterns, and the GoTenna Mesh communications system, among others.
- The Community Mapping of Risks identifies the most vulnerable in the community (bedridden individuals, disabled patients, those who need medication to survive, and infants). It identified medication needed by each family, families with animals, and people who live alone.
- Identified vulnerable geographic areas and made contingency plans to access homes where access could be obstructed. (i.e, entrance of helicopters to area, use of churches as distribution centers).

Infrastructure

- Solar panel system and TESLA batteries, installed by Resilient Power Puerto Rico.
- Water Cisterns: 1,500 gallons of potable water.
- Digital communication system: GoTenna Mesh.
- Portable solar panels to charge phones.
- Multipurpose Room: This activity room is rented regularly for private or community activities. Rental includes 15 tables and chairs for \$200. This room uses solar panels.
- Tents used for providing hospital ambulatory medical services within the Center's land.
- Equipment: two refrigerators, a freezer, two emergency power generators, recovery equipment and tents for 3 patients each.
- Communication Center.

Programs

- Emergency Preparedness Plan.
- Renacer Program: Activities with individuals over 55 years old. They provide cooking and, arts and crafts classes.
- Technology Center: Currently known as the Community Telecommunications Center, but they are preparing the room to be a Technological Center.
- El Viejo de mi Calle Program: Program already established in La Florida and Los González neighborhoods. They have identified the elderly, bedridden individuals, disable people, medicine needed and those who own animals.
- Counseling services and workshops, as needed.
- Agricultural Extension Program: They are developing community gardens with the help of an agronomist.
- Health clinics and festivals for the provision of medical services, including psychological counseling.
- GoTenna Mesh: System that is combined with cellular phone to create its own signal to send text messages and GPS locations without cellular or internet service. The device transmits messages in private and automatic form through other mobile devices to expand reach from one point to the other; therefore, the bigger the network the stronger the communication. There is a total of 9 communities

with this system. The community handed a GoTenna phone to Emergency Management to open a channel of communication with them for the next emergency situation.

- CERT Workshops: Some community team members that work in the Center have taken these certifications.
- Theatre group.
- Folklore and Community Historical Museum.
- Housekeeper Program: They have identified persons that live alone or elderly people that take care of other elderly and they provide them with housekeeping assistance.
- It serves as a distribution community center during emergencies as part of an agreement with the Puerto Rico Emergency Management Administration (NMEAD for Spanish acronym).
- Future Plans
- Solar panels for the community.
- Acquire a pick-up truck to perform collection and distribution of food and basic supplies.
- Acquire a drone to take picture of the community and be able to have visibility in areas with challenging access after a disaster. They already have certification.



Photo by: María Roldán

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

- Solar panel system and TESLA batteries: *Para La Naturaleza* (5.2 KW).
- Water Cisterns: *Para La Naturaleza* .
- Communication Center renovation: Mercy Corps., The Miami Foundation, Walmart.
- Community Garden: Mercy Corps.
- CERT workshops: Mercy Corps., The Miami Foundation, Walmart.

GUARDARRAYA UNIDOS POR UN PATRIMONIO EDUCATIVO INC., PATILLAS



"WE SAW AN OPPORTUNITY, AFTER THE SCHOOL CLOSED ITS DOORS"

Center: Organized since 2014. Building Rent / Owned since 2015. Community: 1,603 Inhabitants. 800 families

<https://www.comitegupe.org>

Facebook: [Guardarraya Unidos por un Patrimonio Educativo - GUPE](#)



Image taken from Guardarraya Unidos por un Patrimonio Educativo, Inc. (GUPE) website

Resilience Elements:

- **Community Programs:** The community offers physical and mental health programs, workshops, resilience programs, career mentoring services for the youth, and economic development programs and small business opportunities.
- **Community Gardens:** The community center has an area dedicated for agriculture, which includes a hydroponic garden. Neighbors and local restaurants purchase the crop and with that income they maintain the garden. In addition, soon they will be creating an artisan seasoning sauce for sale throughout the island. The community created an alliance with a local university so that the Agronomy students can utilize the center for practice sessions.
- **Emergency Preparedness Plan:** Because of its location, the community is exposed to various climate risks and access problems. That is why they have an evacuation plan and a hurricane, earthquake and tsunamis response plan, as well as communication plans and a supply distribution plan.

Establishment and Organization of the Community Hub

The Guardarraya Unidos por un Patrimonio Educativo (GUPE) Center is in a closed school that used to be one of the primary academic institutions of Patillas. The building is considered patrimony of the area and it occupies 27 acres of land and at one point it served as a school to more than 900 students. The school closed in 2014 and in 2015 the community members, with support of the Mayor's Office, were able to obtain a lease for a decade to establish their community center. Today it is a meeting point for youth, elderly, and neighbors from nearby towns. The center provides workshops and activities that promote economic development, physical and mental health, and it serves as a distribution and support center after emergencies.

After Hurricane María

- The community was left completely uncommunicated.
- Many had to abandon their homes, due to severe damage to homes.
- They didn't have electrical power for 7 months.
- They didn't have access to water for several months
- Recognition from Mayor for being the first sector in Patillas in cleaning up debris.
- The community was able to deliver donated supplies in an organized quick manner; they were able to service up to 400 persons in one day.
- The center created emergency preparedness plans for hurricanes, earthquakes, and tsunamis.

Infrastructure

- Solar 48 panel system with batteries.
- Emergency water cisterns, stores 1,500 gallons that serves 1,000 persons.
- Multipurpose rooms are used for community activities, and they are preparing to rent the facility for private activities.
- Room for used clothes sales where they sell a bag for \$5. They have clothes for children, men, women, and formal clothes and shoes.
- Room dedicated to selling used home products, such as decorations, furniture, and cooking products.
- Room with medical equipment to assist the community.
- Industrial kitchen with gas system, two refrigerators, freezer, food prep tables, fryers and warmers for selling fried food. They will soon be receiving ASPE certifications. They sell lunches made on this kitchen.
- Gymnasium where membership costs \$15 per month. They have cardio machines, yoga equipment and they offer various workout classes.
- Agriculture garden area: Hydroponic, table and soil sowing. They grow plantain.
- Soon to have a technology center and a supply area.
- Satellite phone connection.

Programs

- Daily activities offered for the elderly.
- They have an alliance with nearby churches and they collaborate in camps, and socialization events.
- Career/Job mentoring program where community leaders try to identify job opportunities for young adults and they provide workshops to prepare them for the professional world.
- Newspaper Program where the community creates and distributes a monthly newspaper where they publicize activities, opportunities and any changes to the evacuation and emergency preparedness plans.
- Pastry workshop.
- CERT Workshop Program: Some administrative staff are certified.
- Donations Program where school alumni make

donations to the center while the community keep alumni up to date on hub activities.

- Webpage where they publish activities and collaborations.

Future Plans

- Expand community garden to increase crops.
- Developing an artisanal product: GUPE Seasoning sauce, to be produced in center and sold throughout the whole island.
- Rehabilitating rooms which are currently closed to be able to provide other types of activities.



Photo by: María Roldán

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

- Mercy Corps..
- Instituto Socio-Económico Comunitario (INSEC).
- Salvation Army.
- Servicio de Extensión Agrícola.

G-8 CAÑO MARTÍN PEÑA

SAN JUAN, PUERTO RICO



"SPACES FOR COMMUNITIES TO GET ORGANIZED DURING A CRISIS"

Center: Organized since 2004. Building Rent / Owned since 2004 Community: 15,000 Inhabitants. Over 400 acres of land.

<https://g8incpr.wordpress.com>
www.globalliving.org

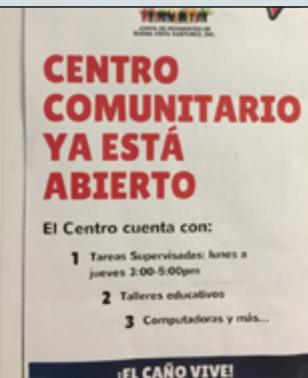


Image courtesy of Reimagina. Photo by: Alicia Díaz

Resilience Elements:

- **Community Capacity:** G-8, Inc. is a non-profit organization that unites community leadership of all communities surrounding the Martín Peña Channel. G-8, Inc. acts as a unifying entity of community, civic, and recreational organizations of all of the communities. They have strong community leadership and organizational capacity with more than 100 community leaders.
- **Community Programs:** They offer various programs to attend community needs in health, recreation, and education with sports and supervised study programs for kids and programs for the elderly.
- **Sustainable Energy:** System of solar panels and batteries for the 3 community centers.

Establishment and organization of the Community Hub

Fideicomiso de la Tierra del Caño Martín Peña emerges from Law 489 of 2004 and it is the instrument that was utilized by the residents of the surrounding communities of the Martín Peña Channel, in its early stages informal settlements, to control and lead the development of those lands without risking displacement of its residents. G-8, Inc. was registered as a non-profit organization on June 28, 2004. It unites the community leadership of all communities surrounding the Martín Peña Channel. Through G-8, Inc. they were able to create legislation that recognizes community participation of the Martín Peña Channel communities.

Today G-8 manages 3 community centers of the Fideicomiso de la Tierra: Buena Vista Hato Rey y Las Monjas Community Center; Buena Vista Santurce Multi-Use Center; and Mini Oratorio los Hijos de Don Bosco. In the 3 centers, they offer: supervised studies to community students; sports program; literacy programs; and they identify and work with community needs.

After Hurricane María

- The 3 community centers operated as collection and distribution centers and served as meeting point for families and communities to organize and support each other in the middle of the crisis.
- Solar panels and Tesla batteries were donated and installed in each center. This helped the community meet and use the center to recharge cell phones and communicate with their family members.
- Currently, they do not have back-up water and communications systems. Thirteen months after the impact of Hurricane María they still did not have their internet service working.
- The centers have a Collaborative Agreement with the Municipality of San Juan where the Municipality covers water and electricity costs and the community leadership manages the centers, provides maintenance services, and provides programs and initiatives for the community.
- The centers are currently managed by residents of the same community.

Infrastructure

- 3 Community Centers.
- Solar panels and TESLA batteries in each center, installed by Resilient Power Puerto Rico.
- Big auditorium in 1 center where they celebrate big activities.
- Equipment: refrigerators, computers, stoves, projector, audiovisual equipment, tables, chairs, school supplies, books.

Programs

- Sports Program for Kids: “Prevención de Violencia” (40 students of each community where each student must complete school assignments before participating in sports program).
- Supervised studies to community students.
- Health Fairs.
- Recreation, Integration and Empowerment Project (RIE): Project directed to the elderly for recreation and empowerment.
- They have various community gardens in areas near the centers.



Image courtesy of Reimagina. Photo by: Alicia Díaz

Future Plans

- Searching for funding to expand their capacity and improve their programs, and they are pursuing efforts to obtain control of the 4 closed schools in the Martín Peña Channel area for community use.
- Exploring to develop capacity of back-up water and communications systems.
- Work in the development of resilient dining areas.



Image courtesy of Reimagina. Photo by: Malu Blázquez



Image courtesy of Reimagina. Photo by Christina Fawaz

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

- Solar panels and TESLA batteries: Resilient Power Puerto Rico.

To learn more about non-profits that helped the Community Center *Asociación de Comunidades Unidas Tomando Acción Solidaria*, please visit their website.

COMITE COMUNAL CORCOVADA, INC, AÑASCO



"WHEN A COMMUNITY FEELS OWNERSHIP OF ITS SPACES, IT CAN IMAGINE MORE THINGS."

Center: Organized since 1966. Building Rent / Owned since 1990.

Community: Approx. 600 Inhabitants. 160 families

<https://comitecomunalcorcovada.weebly.com/>

Facebook: [Comité Comunal Corcovada, Inc.](#)



Image courtesy of Reimagina. Photo by: Malu Blázquez

Resilience Elements

- **Community Capacity:** The community is incorporated and organized under the Corcovada Community Committee, Inc. The community collects money for their maintenance services through water services fees, donations from activities, and rental fees of community facilities. They have the technical and economic capacity to build, operate, and maintain the community aqueduct and part of its infrastructure
- **Community Programs:** Educational and recreational programs, reforestation and community activities
- **Access to Water and Essential Provisions:** They have a community aqueduct connected to two systems of wells and pumps, which serve in providing water redundancy. One operates with a solar system, and the other is connected to an emergency generator
- **Community Garden**

Establishment and organization of the Community Hub

The Corcovada Arriba community has been organized since 1962. It began with the help of the *División de Educación a la Comunidad (DIVEDCO)* and other local actors, due to the need to build roads, a church and its community aqueduct, given the lack of service from PRASA. This aqueduct is operated and managed by the community, including the second well constructed later. In 1991, the organization evolved from the aqueduct committee to the incorporation of the Corcovada Community Committee, Inc. In 2012, they obtained the state tax exemption. Currently, they manage the recreational areas, the convention center, the Multi-Use Center, the gym, and the old school, along with their subcommittees. The Committee is responsible for charging services to operate the community. These funds cover the maintenance of green areas and purchase of materials to paint the centers. In 2015, USDA Rural Development provided them with solar panels for one of the two pumps. Today, the aqueduct operates entirely with a system of solar panels and batteries.

After Hurricane María

- The community was able to handle the restoration of physical infrastructure (aqueduct, roads, houses).
- Water service and quality were maintained during the catastrophe, and water was provided to surrounding communities.
- The community assisted in the restoration of communal areas and assisted the PR Electric Power Authority in raising electric poles to restore service faster than other communities.
- Multiple organizations collaborated to provide a redundancy battery system in 2018.
- An emergency generator (17kW) was installed for one of the aqueducts provided by a local church.

Infrastructure

- The community manages and operates its community aqueduct.
- Two wells with water pumps, both supply the main network, which allows for a redundant water resource when one of the wells cannot supply the tank. One has an emergency generator (17kW), and the other is connected to a solar system (main power source). Both systems are connected to PREPA.
- Water tank of 23,000 gallons.
- Water chlorinator / underground distribution system for 160 houses /meters per household.
- Convention Center: they rent it for private activities and the community; communal center and recreational area: basketball court, swings, ballpark, bathrooms, stage, and office; The Multiple Use Center contains the following amenities: Free gym or at a meager cost for the community (this space has a fridge and storage areas).
- Technology Center with 18 computers, Internet access, and a videoconferencing system used by universities to provide workshops.
- Offices with photocopiers used to collect the water fees
- Medical office with cardiovascular equipment. They are looking for a doctor to attend community.
- Community garden.

Programs

- They teach English, computer classes and have the capacity for remote education programs.
- Recycling, cleaning, and reforestation program.
- There are recreational programs: reforestation, Zumba classes, gym, community activities (Mother and Father's Parties, and the Festival of Kings) and events with external resources (health and theater fairs).
- It served as a collection center after Hurricane Maria.

Future Plans

- There is a proposal to convert the entire community into a solar community, with a total of 152 houses, and install solar panels in different facilities.
- They plan to start renting their land for people to come to the community for camping, and develop the area economically.
- Library.
- The Multipurpose Center (a school that closed in the 90s) does not have solar panels; the plan is to install solar panels before the start of the next hurricane season 2019.
- Create an Emergency Management Center in the Multiple Use Center. Rooms on the second floor are unused, looking for options to develop activities in them.



Image courtesy of Reimagina. Photo by: Alicia Díaz

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

- Solar panels to service the aqueduct: USDA Grant y Municipio de Añasco.
- Battery backup system to cover the community aqueduct: Somos Solar, Fundación Comunitaria de PR, Máximo Solar.

ASOCIACIÓN DE COMUNIDADES UNIDAS TOMANDO ACCIÓN SOLIDARIA, TOA BAJA



TOA BAJA WAS A SCENE OF DEVASTATION, BUT ALSO OF HOPE.

Center: Organized since 2018. Building Rent / Owned since 2019.
Community: Barrio Ingenio, principalmente Villa Calma 1 and 2,
and Villa del Sol.
www.acutas.org

Facebook: [Acutas](https://www.facebook.com/acutas)



Photo by: María Roldán

Resilience Elements:

- **Community Capacity:** The community joined forces in an unprecedented manner after Hurricane Maria. Several community members organized and created a hierarchy to build capacity formed alliances with local government and non-profit organizations, and rehabilitated the campus they currently use as headquarters.
- **Community Programs:** The community has a dedicated space and program for providing mentoring and opportunities for local-based microenterprises. The goal is that these companies can serve the municipality on a larger scale. They also have a children's camp and a weaving group.
- **Safe and Accessible Space:** The community has a Center with green spaces and comfortable facilities. It is strategically located among communities and at the highest level, preventing the floodwaters from impacting the building.

Establishment and organization of the Community Hub

The Barrio Ingenio Community Center / ACUTAS (Acción de Comunidades Unidas Tomando Acción Solidaria) is located in the abandoned facilities of a Head Start in Toa Baja. The Center serves the communities of Villa Calma 1, Villa Calma 2, Villas del Sol, and Bo. Ingenio. After hurricane María, the neighbors came together to form brigades for cleaning and delivering supplies to homes in the area. This union became a non-profit organization (M.A.S. Villa Calma), and along with Sol Es Vida, created ACUTAS. Toa Baja's municipal legislation unanimously approved Resolution No. 10, Series 2018-2019, to transfer the former Head Start and turn it into the official headquarters of ACUTAS.

After Hurricane María

- Surrounded by three bodies of water, many houses with one and up to two levels were completely flooded. The neighbors evacuated with kayaks or helicopters.
- On the night of Hurricane Maria, in search of shelter, the current community leader of Villas Calma 1 opened a school and turned it into an improvised shelter.
- Negotiated and collaborated with the Mayor's Office to receive the facilities of an abandoned Head Start, free of charge.
- Partnered with non-profit organizations, local government, and other communities to design a better and self-sufficient future.

Infrastructure

- Solar panel system.
- Spaces for Microenterprises: Workshop of serigraphy, Tropicshirt, weavers.
- Industrial kitchen.
- Supply warehouse.
- Children's room.
- Computer room.
- Administrative offices with technology and air conditioning.
- Water and power systems are connected and paid by the municipality.

Programs

- Art and literature workshops for children, youth and adults.
- Supervised tutoring for children. Capacity: 50 children.
- Health fair, 334 patients at the Eye Clinic.
- Psychology services.
- Summer Camp for children. Capacity: 100 children.
- Weavers Group.

Future Plans

- Reduce water use with green alternatives such as rainwater harvesting.
- Drinking water cistern.
- Fix and improve the electrical system of the ACUTAS Center. The system suffered from abandonment and mice during the years it was closed.
- Develop community kitchen microenterprises, with the support from Los Cidrines, to advance bakeries, cafeterias and/or bread factories for the community and other nearby businesses.
- Develop an industrial sewing microenterprise for uniforms.
- Electronic library for the community.
- Seamstress group.
- School for adults.

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

To learn more about non-profits that helped the Community Center *Asociación de Comunidades Unidas Tomando Acción Solidaria*, please visit their website.



Photo by: María Roldán

FE QUE TRANSFORMA

VIEQUES

"A SOCIALLY TRANSFORMATIVE CHURCH"

Center: Organized since 2011. Building Rent / Owned since 2018.

Community: 9,000 Inhabitants

<http://www.fequetransforma.com/web/>

Facebook: [Iglesia Fe que Transforma](#)



Photo by: María Roldán

Resilient Elements:

- **Community Programs:** The community offers workshops with different organizations. It also conducted the first children's resiliency camp with more than 70 kids registered.
- **Dependable Communication:** The center has a KP4 radio communications system equipped with radios that connect the whole island with first auxiliary response and assistance during emergencies.
- **Access to Water and Essential Provisions:** The center has a rainwater collection and purification system that uses reverse osmosis. The church created alliances with 4 private wells that provide water in case of an emergency. They have also developed a food supply reserve that provides food to approximately 600 families and a "happy backpack" program.
- **Emergency Preparedness Plan:** The center has an internal and external communication system, and a mechanism to distribute.
- **Sustainable Energy:** The church has solar panels to run important hub equipment.
- **Community Garden.**

Establishment and organization of the Community Hub

The *Fe que Transforma* Church in Vieques was founded 2011. Since then, its mission has been to improve the quality of life of the people of Vieques through faith, education and resiliency. The church members have an exemplary mechanism, designed by themselves, that has allowed them to increase outreach and receive and distribute assistance in an organized and effective manner. In its early stage, the Church identified 16 basic needs of the people in Vieques, and then created mechanisms to attend those needs. Today, the Church utilizes the facilities of an old closed school which is strategically located in the highest point in Vieques and in the middle of the island.

After Hurricane María

- Due to the fact that Vieques is an island municipality it became isolated. Vieques was without ferry system for 16 days.
- The Church had developed a community profile before the Hurricane María which allowed the Food Program to provide food to over 1,000 families, even though it was originally designed to supply food to 500 families for a period of 72 hours.
- Serviced 6,800 people per month, and managed nearly 400 pounds of food and basic necessity products in a period of three months.

Infrastructure

- Solar panels system and Tesla batteries.
- Water cisterns: 1,000 persons /oasis.
- Rainwater collection and filtration system and reserve of 20,000 gallons.
- Agreement with private wells on the island that allow water extraction in case of emergency.
- Food supply reserve for 1,000 families for 10 days with products rotation.
- First solar theatre in Vieques and second in PR. This theater can also be used for conferences, workshops and seminars (Capacity: 70 people). It has AC, projector and sound system.
- Room for workshops and seminars (Capacity: 30 people).
- Basketball court and play area for kids.
- Kitchen with industrial equipment and laundry room. They have cots, two showers, three bathrooms, and a washing machine for uniforms.
- Community garden: They sell accessible priced products to local restaurants and people.
- Administrative Offices – Database with over 1,500 families registered with profile data on socioeconomic, psychological, spiritual, sick, infrastructure, and profession.
- Emergency Radiocommunications Office (ORE-FQT) – KP4 and satellite communications system. The radio system enabled coordination of logistics during Hurricanes Irma and María. It allows communications with all the agencies and allows communication with citizens through their radio, which reaches from Florida to the Virgin Islands.
- Weather Station that serves as reference point to the National Weather Service, Radio Aficionados and students.



Photo by: María Roldán

Programs

- Technology and Sustainability Program: workshops on renewable energy, construction, entrepreneurship (agriculture, tourism, herbs).
- Happy Backpack Program: kids take a backpack with food to their homes.
- Two religious weekly services (meetings for spiritual building) – Wednesdays (6:30PM), Sundays (10 AM).
- Community Communications Plan is practiced weekly during hurricane season.
- Distribution system of provisions during an emergency.
- In case of an emergency, the center serves as a support center for first responders. They have capacity for 30 people.
- Good Dressing Program: supply of clothes and basic necessity products. They serve 100 families a month.
- Resilient Camp: They provide school materials, and training on what to do during an emergency and how to be resilient.

Other resources

- Support from two engineers that maintain systems.
- Donation System 90/10% - where 90% is used for the community, 10% for operations.
- Achievements - 45 persons graduated in construction for rapid reconstruction.
- Support to the Fishermen Community (30 boats)

Future Plans

- Construction of a Community Clinic – They are to bring specialists from the big island so that patients can be treated there. In case of emergency, the clinic will work as support and it will have first aid equipment and volunteer nurses.

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

- | | |
|--|--------------------------|
| • Banco de Alimentos de Puerto Rico | Corporations: |
| • Feeding América | • USA Environmental Inc. |
| • Operacion Bendicion Internacional | • JACOBS Inc. |
| • Unidos por Puerto Rico | • Inter Island Service |
| • MERCY Corps | • JJ Agrocentro |
| • Damascus Road Community Church | |
| • Vieques Loves | |
| • Radio Operadores del Este Inc. (RODE). | |
| • Asociacion de Radioaficionados de Utuado (ARU) | |
| • Red Ministerial Apostolica (REMA) | |
| • Iglesia Cristiana Misionera de Bayamon | |

PROGRAMA DE EDUCACIÓN COMUNAL DE ENTREGA Y SERVICIO (P.E.C.E.S., INC.)



"TOGETHER WE ACHIEVE MORE"

Center: Organized since 1985. Building Rent / Owned since 1985.

Community: +4,000 residents. +600 students.

<https://www.pecesinc.org>

Facebook: [PECES, Inc](#)



Image courtesy of Reimagina. Photo by: Malu Blázquez

Resilient Elements:

- **Community Capacity:** P.E.C.E.S. is a strong community organization with more than 34 years of experience. Recognized in Puerto Rico for its outstanding work, outreach, and impact.
- **Community Programs:** They offer educational services (with first Accredited Alternative High School), youth intervention, economic development and community development programs.
- **Access to Water and Essential Provisions:** The center has a water purification system and 2 cisterns, and they are looking to expand their water access capacity. It served as central service point for the Punta Santiago community for distribution of essential provisions.
- **Sustainable Energy:** Solar Energy System in their school.

Establishment and organization of the Community Hub

The Program for Community Education, Commitment and Service, Inc. (P.E.C.E.S. Inc.) is an incorporated non-profit community organization. The goals of P.E.C.E.S., Inc. are directed to four programmatic areas: education (including special education), youth intervention, economic development and community development. The mission of P.E.C.E.S. is to promote the educational, economic, and social development of eastern Puerto Rico. The objectives of P.E.C.E.S., Inc. are: to contribute to the economic development of southeastern Puerto Rico; to form leaders that participate in the integral development of their communities; to improve the educational opportunities of eastern Puerto Rico; and strengthen families and communities through programs directed to impact access to a wide variety of services. P.E.C.E.S., Inc. is focused in preventing child-abuse and neglect, high risk behaviors, and negative conduct through an integral program of prevention, counseling, orientation and social work; and reducing and preventing abuse of drugs,

alcohol, tobacco, AIDS, violence, and juvenile delinquency. They provide youth with positive alternatives, service opportunities, and leadership formation.

P.E.C.E.S., Inc. has been able to impact 25,000 lives each year. They operate the first licensed and accredited high school created especially with an alternative education model. They have prepared more than 1200 community youth leaders throughout their 34 years of service in eastern Puerto Rico, including a special project of Community Health Youth Leaders. They administer the Natural Reserve of Humacao, based upon a contract of 15 years with DNER, as an initiative to create employment and community economic development, as an ecological tourism business and as an environmental protection project. P.E.C.E.S. Inc. has established a Youth Development Center winning the prestigious Tina Hills Award in 2003 for excellence as a non-profit organization.

After Hurricane María

- In the Humacao area, measured sustained winds reached 175 miles per hour for a minute, causing great destruction and much flooding.
- P.E.C.E.S. was left without water and electricity for a long time and was not able to reopen the school until January 2018.
- It served as the resilient institution for the Punta Santiago Community creating a supply center for food, provisions and potable water. Various NGOs donated to P.E.C.E.S. supplies and equipment, including power generators and washing machines. Community members would go at designated hours to receive water, food, and even wash clothes.
- With the help and support from many NGOs, P.E.C.E.S. was able to impact approximately 94,000 people after the hurricane impact by providing hot food, canned food, drinking water, water filters, medicine, clothes, tools, legal and psychological services, and baby diapers and supplies.

Infrastructure

- Solar panels and batteries, and a big power generator (Generac 80 KVA) and other smaller ones.
- School facility with Student Center and classrooms.
- Water purification system and 2 cisterns of 300 gallons.
- Basketball court with roof and offices.
- Kitchen with storage space, a big refrigerator, various freezers, gas stoves, and microwave.
- Computers, washing machines.



Photo by: Yanel de Angel

Programs

- Accredited Alternative High School that uses innovative approaches.
- Prevention based mentoring program for at risk students.
- After the hurricanes, the community center served as a distribution center of basic supplies.
- They currently have an emergency and contingency plan.
- Have started mapping the community by identifying vulnerable persons and flood zones.
- Entrepreneurship Program.

Future Plans

- Build a new Resilient Community Hub.
- Looking to obtain and install water cisterns of 10,000-50,000 gallons and establish a rainwater collection system.
- Finalize community mapping.

NGOs THAT HAVE CONTRIBUTED TO THIS COMMUNITY CENTER

To learn more about non-profits that helped the Community Center *Programa de Educación Comunal de Entrega y Servicio (P.E.C.E.S, Inc.)*, please visit their website.

An aerial photograph showing a community center in Daguao, Puerto Rico. The image captures several buildings, some with significant damage to their roofs and walls. A large, dense green tree stands prominently in the center-left. To the right, there is a paved parking lot with two white cars parked. The surrounding area includes more buildings, some with solar panels, and patches of grass. The overall scene suggests a community center that has been affected by natural disasters, likely hurricanes, given the damage to the structures and the presence of debris.

Comité Desarrollo Social y Cultural
Daguao, Naguabo aerial view.
Image courtesy of Resilient Power
Puerto Rico. Photo by Diana Serrano.

We created this resource to help communities design resilient community centers to strengthen organizational capacity, promote education year-round and be able to face climate, social and economic changes. It offers practical suggestions, including developing community organization, operational capacity and relevant physical assets to achieve resilience.