



Health Facilities and disaster-resilience: The PAHO Smart Hospital project

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A REGION AT RISK

Event	Where	Total # Deaths	Total Damage (US\$)
Hurricane Irma – 6 September	Antigua & Barbuda, BVI, St Martin/Maarten, Cuba, etc.	≥ 134	\$3.6B – BVI* \$222M - Barbuda
Hurricane Maria – 18 Sep 2017	Dominica, BVI, Puerto Rico	≥ 97	\$1.35B - Dom



Video PAHO in Dominica

<https://www.youtube.com/watch?v=c6qrdw0HWRk>

A REGION AT RISK



Leonora Hospital, Guyana



AIM:

Project Description

“To provide safer, greener health facilities to deliver care in disasters”





SMART HOSPITAL INITIATIVE IN THE CARIBBEAN

- Ensure health care facilities are environmentally friendly and disaster resilient
- Reduce impact of Climate Change
- Reduce operational costs
- Enhance user comfort and performance
- Empower decision makers to select the most cost effective green improvements to undertake at a facility, thereby allowing them to make Smart decisions.

Project Description



Output#1:

All healthcare facilities will be assessed for disaster safety, water and energy consumption. This will provide a roadmap for risk reduction investment as well as green measures and be incorporated into the national risk exposure database of each country.

Output#2:

Smart standards will be implemented in selected health care facilities in Belize, Dominica, Grenada, Jamaica, Saint Lucia and St. Vincent and the Grenadines.

Output#3:

National and regional capacity will be developed to promote climate smart health facility standards. This includes:

1. Health workers and users of the facilities;
2. Other sectors and climate change platforms or programmes;
3. Technical stakeholders (construction, engineering, architects etc);
4. Media.

SMART² (PHASE II)

DFID/PAHO Project



- 5-year Project
- 7 countries: Grenada, St. Lucia, St. Vincent and the Grenadines, Dominica, Guyana, Belize and Jamaica
- Over 400 Health facilities assessed (safe & green)
- Over 600 people (49% female) trained
- Smart App created with database
- “SMARTing” of at least 4 facilities in each country
- Improved Technical material/ Tools
- Develop National & Regional Capacity
- Integration of USAID Caribbean Clean Energy Program tool

Smart Health Care Facilities in the Caribbean Project

Providing Safer, Greener Health Facilities to Deliver Care in Disasters

Retrofitting the Chateaubelair Hospital and Clinic



Implemented by PAHO in conjunction with the Ministry of Health and the Environment



Implemented by: Pan American Health Organization (PAHO/WHO)
Funded by: the UK Department for International Development (DFID)



Organization: MoH, PAHO, DFID



- **Ministry of Health: Beneficiary**
 - Ministry of Health is responsible for the Health System network in the country
- **PAHO: Executing Agency**
 - Oldest Health agency in the world (1902)
 - Lead strategic collaborative efforts among Member States and other partners to promote equity in health, to combat disease, and to improve the quality of, and lengthen, the lives of the peoples of the Americas.
- **DFID: Donor**
 - The Department for International Development (DFID) leads the UK's work to end extreme poverty. DFID tries to end the need for aid by creating jobs, unlocking the potential of girls and women and helping to save lives when humanitarian emergencies hit.

Organization: PAHO



— Barbados:

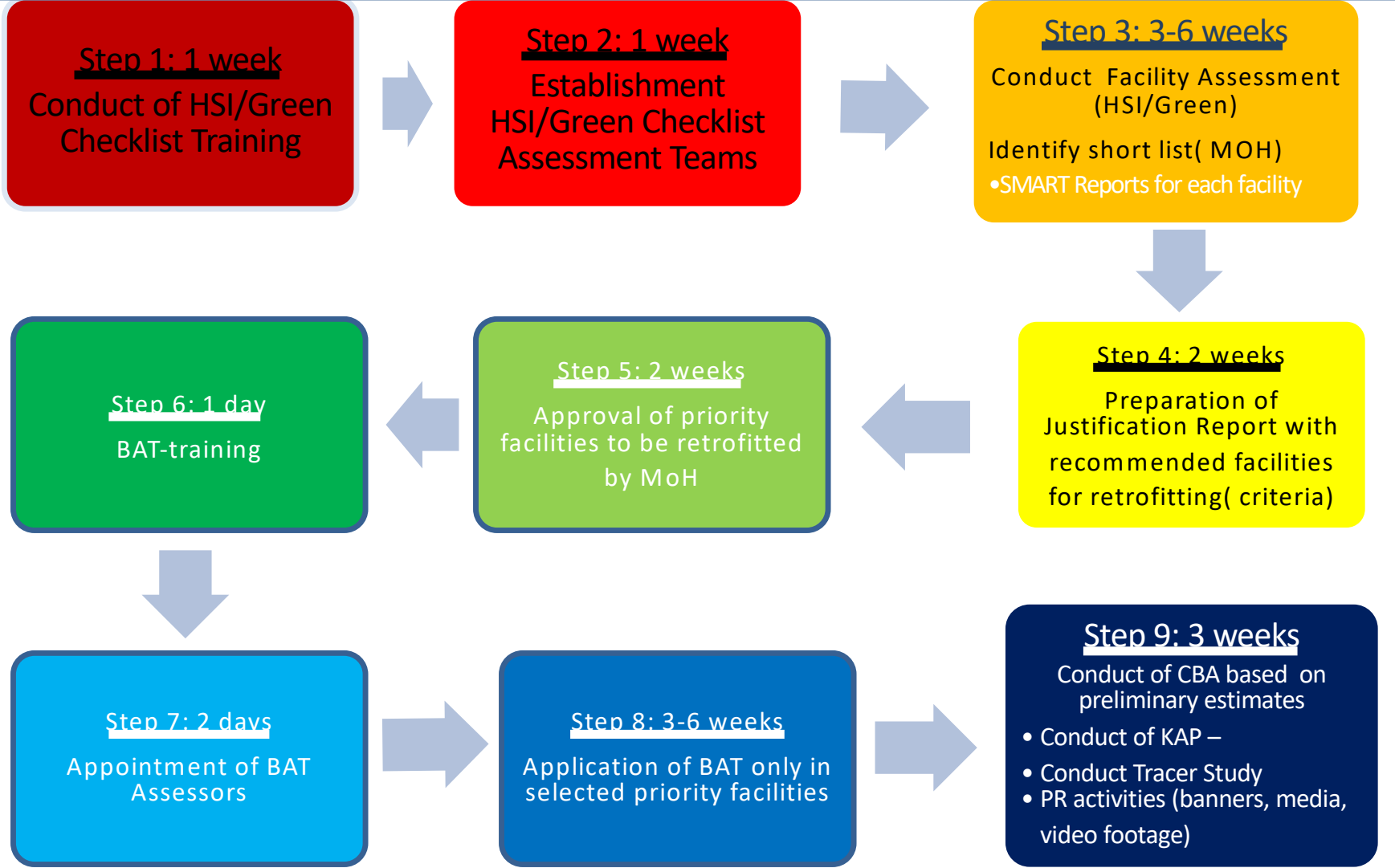
- Program manager
- Advisor Planning and Operations
- HR, Administration and Finances
- Architect
- Procurement

— In-country:

- Structural check consultant
- MEP check consultant
- Green check consultant
- Country supervisor / technical consultant
- National PAHO Consultant (Belize, Jamaica and Guyana)



Process output 1 and 3 (22 weeks)



Process output 2 (52 weeks)



Step 10: 3 months

Design Firm Selection

- Market engagement: contractors course
- Expression of interest (4)
- Tender (5 weeks)
- Award contract (4 weeks)



Step 11: 4 weeks

Design Firm: Preparation of Inception Report – 2 weeks

- Review of Inception Report for Quality Assurance – 1 week (check consultant)
- **Start with show case facility**



Step 12: 2 weeks

Preparation of Design 1



Step 13: 4 weeks

Hosting of Town Hall Meeting / Contingency planning/ conservation training



Step 14: 3 weeks

Review / approve of Design 1 by MOH/PAHO / Check consultant/DFID



Step 15: 5 weeks

Preparation of Design 2 with BQs and tender specifications

- Submission of Designs to Planning Authority
- Submission of Design 2 with BQs and tender specifications.



Step 16: 6 weeks

Approval of Designs by Local Planning Authority and check consultants

(14 days – up to 6 weeks)



Step 17: 3 months

Facilitation of the Tender Process

(6 weeks for advertising and 8 weeks for contracting)



Step 18: 3 weeks

Issuance of contracts for retrofitting

Smart Hospital Tool Kit

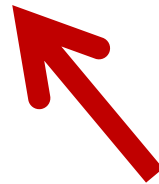


- Hospital Safety Index
 - Existing tool developed by PAHO
- Green Checklist
 - evaluates water, energy, atmosphere, IAQ, hazardous materials, etc
- Baseline Assessment Tool (BAT)
 - Capture of essential baseline information for design specifications, SoW and CBA.
- Cost Benefit Analysis Tool by Florida International University
- Knowledge, Aptitude and Practices (KAP) Survey
- Preventive maintenance manual





Demonstration Project



- Implement sustainable, safe and 'green' retrofits to health facilities in 2 countries



- Georgetown Hospital, St Vincent (old)
- Pogson Hospital, St Kitts (new)

Case demonstration(s)



Georgetown Hospital Saint Vincent and The Grenadines

Before



After



Case demonstration



Scope of Works for Georgetown Hospital (SVG) :

- 1) **Roof Works** – To address roof leaks and strengthen
- 2) **Windows** – To improve ventilation, security and resistance
- 3) **Doors** – To improve security and egress with fire rated safety doors.
- 4) **Plumbing & Sanitary Fixtures** – To upgrade plumbing conditions
- 5) **Electrical Works** – To reduce energy costs and carbon footprint (installation of LED-lights and PV-system)
- 6) **Mechanical Works** – Focused on improving the facility's water storage capacity, provide solar hot water supply, harvesting of rain water to minimize potable water use and improve ventilation in restrooms, wards, etc.

Case demonstration



- 7) **Interior Furnishings** - To improve durability and hygiene
- 8) **Wall finishes** – To maintain a clean, healthier environment
- 9) **Floor finishes** – To improve hygiene
- 10) **Ceiling finishes** – To improve longevity of the exposed rafters and install sustainable drop ceiling to provide ease of access.
- 11) **Code Compliance** – To improve fire safety.
- 12) **External Works** – To improve accessibility and means of egress through added pavements and walkways
- 13) **Main Entrance Works** – To improve safety, security



Wooden, louvered windows to floor



Aluminium windows installed above ground level and with transom for day lighting



Old, wooden doors



New, aluminium, hurricane resistant doors



Old rusting tubular fluorescent light fixture



New LED light fixture



Old, non-functional ----- New diesel generator



Pogson Hospital

St Kitts



Exit sign in Chinese with door that lacks bolting mechanisms



Large exit sign with new door with look through & crash bar mechanism

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Unsecured oxygen tanks



Secured tanks

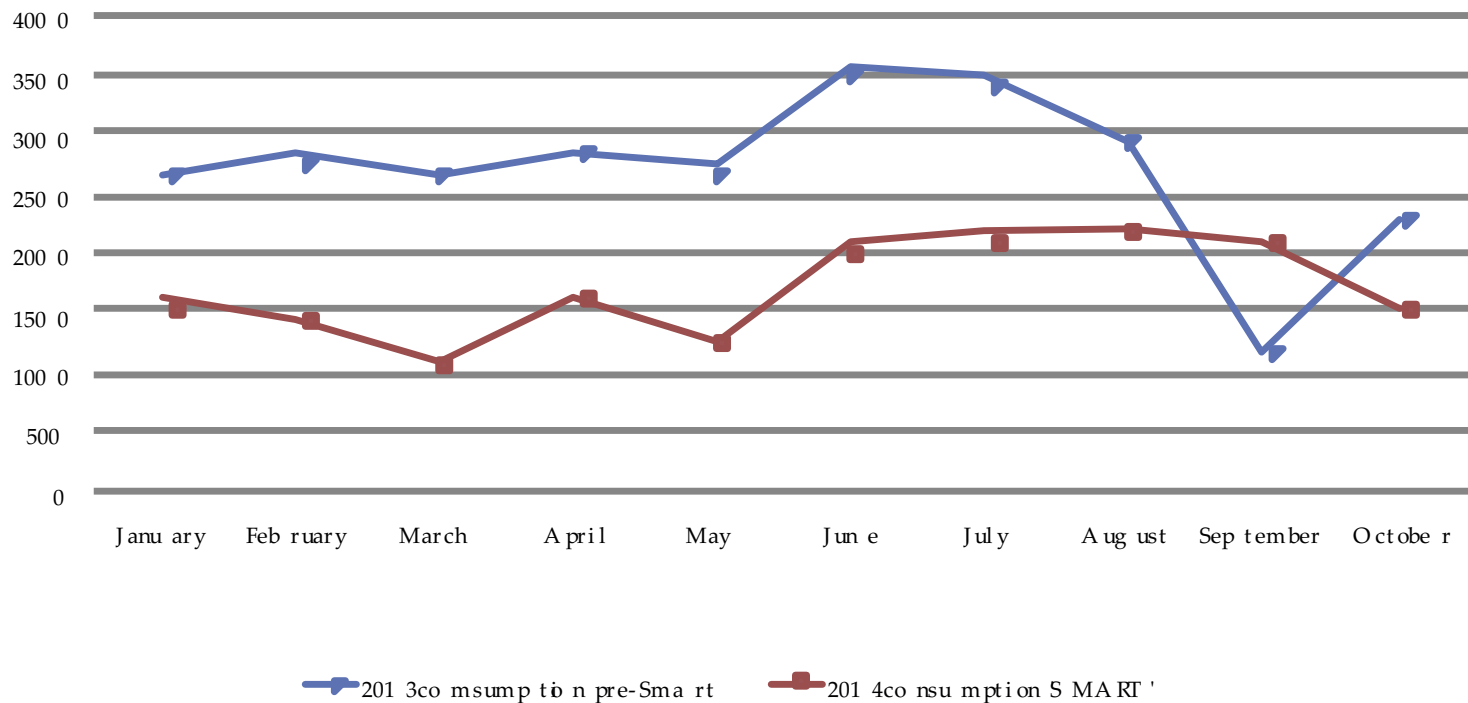


Old inefficient parking lot lighting replaced with new efficient LED lighting



Installed rainwater harvesting system

Electrical consumption for Georgetown Hospital



- Almost **58% reduction** in electrical consumption at Georgetown (Smart) Hospital.
- Return on investment of PV system will be about 4-6 years.
- Patient increase by 34% after re-opening
- Community benefits from waterstorage at the facility.





Training events

More than 600 (49% female) people trained in:

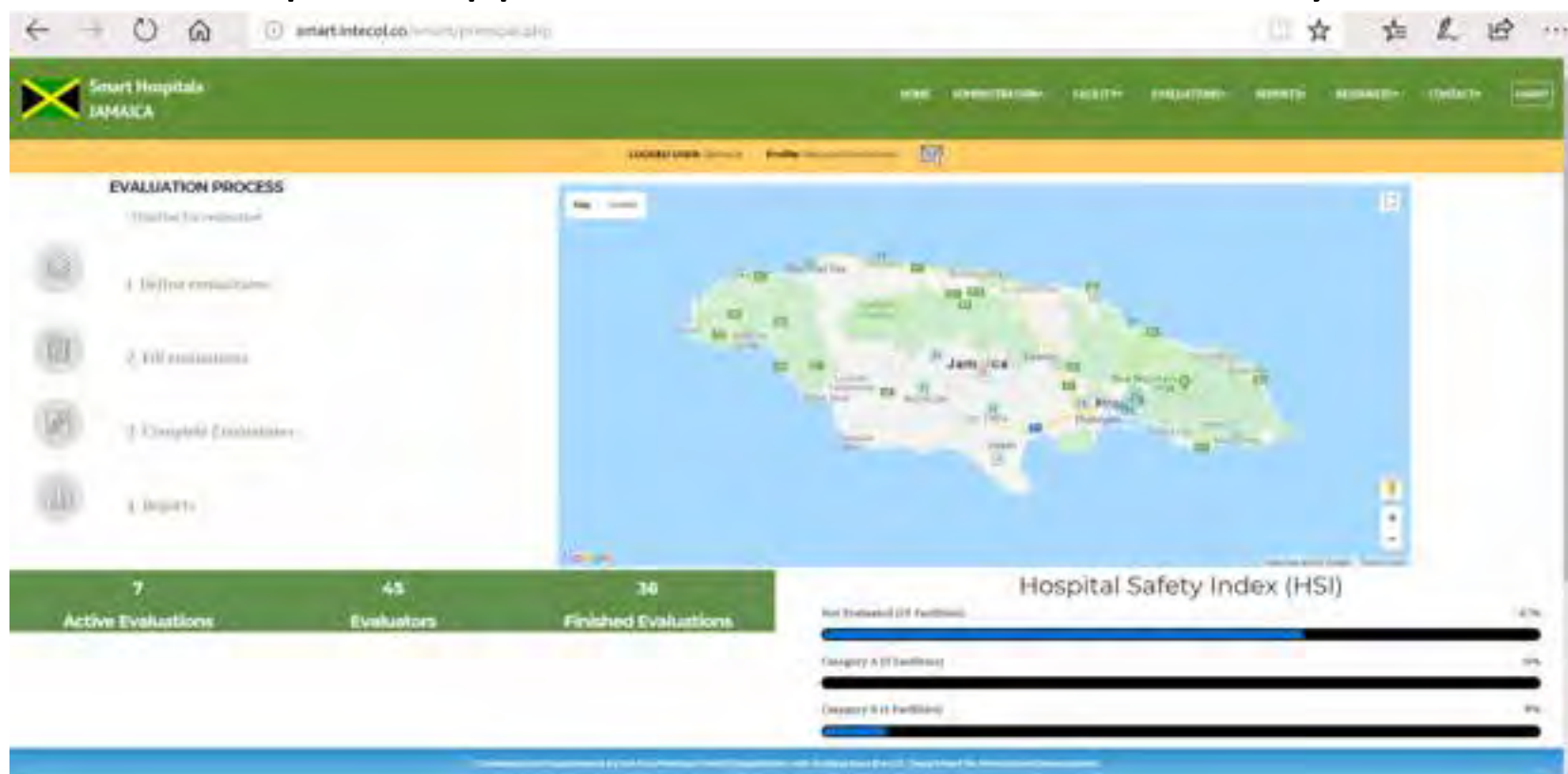
- HSI and GREEN assessments
- BAT assessments
- Conservation training
- Contingency training
- Market Engagement
- Ancilliary Staff
- Preventive maintenance
- Smart App
- USAID CARCEP
- Maintain skills by conducting yearly simulation exercises (SIMEX)!





Smart App

- SMART assessments of 100% health facilities: compiled as a portfolio of investment to attract new donors
- SMART Hospitals App: online database for the country





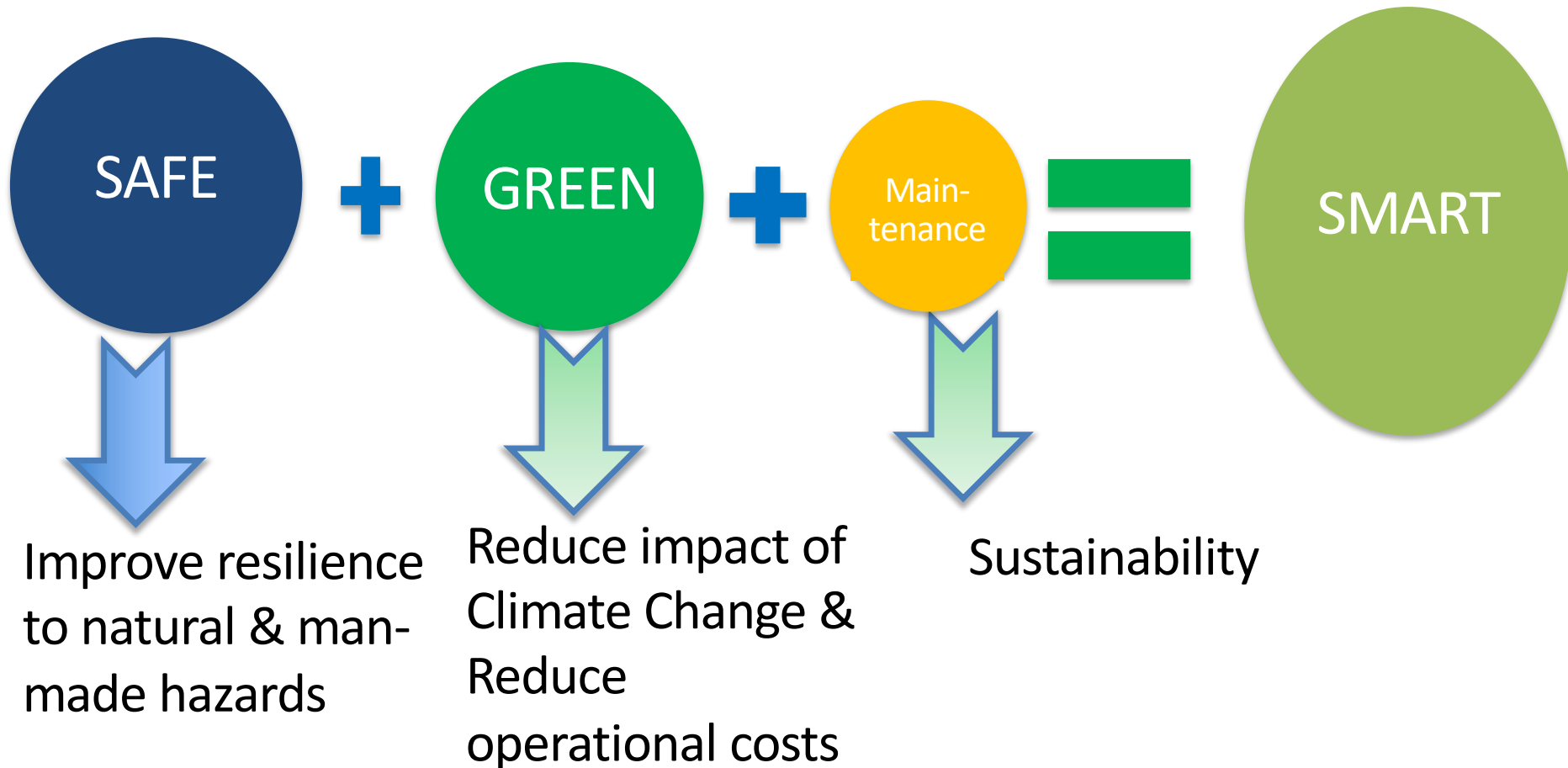
Challenges

- From inhouse design to design firms
- Effects of Irma and Maria
 - Availability of labour force
 - Availability of building materials
 - Access to ports
- Multi-sectoral approach, not just MOH
- Increase awareness through advocacy and PR campaigns
- Savings – maintenance mechanism
- Importance of current external evaluation by UWI





Future PAHO Smart Hospitals Initiative



Other donors and the future of the project



- Global awareness
 - Countries interested on SMART Hospital Initiative:
 - Costa Rica
 - Kosrea Island, Micronesia
 - Solomon Islands
 - Haiti
 - BVI (opening 2x Elderly Homes last week)
 - New Hospital Sint Maarten (Building codes 1934)
- Smart Schools BVI
- Extra EU project Belize

Video Smart Hospital project in VCT

https://www.youtube.com/watch?v=FV_aUKq12yE&t=5s

Smart Health Care Facilities in the Caribbean



Providing
safer,
greener
health
facilities to
deliver care
in disasters

RESULTS

We will achieve:

- Enhanced safety standards
- Reduced down time and damage to hospitals from natural hazards
- Lowered operating expenditures in terms of water and energy savings
- National and regional capacity built to apply and promote climate smart health facilities' standards

Grenada | St. Vincent and the Grenadines | Saint Lucia | Dominica





SMART HEALTH CARE FACILITIES IN THE CARIBBEAN PROJECT - PHASE II

PROJECT DURATION:	June 2015 to June 2020
TARGET COUNTRIES:	Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia and St. Vincent and the Grenadines
IMPLEMENTING AGENCY:	Pan American Health Organization (PAHO/WHO) Department of Emergency Preparedness and Disaster Relief in partnership with the Ministry of Health in each target country
DONOR SUPPORT:	United Kingdom Department for International Development (DFID)

BACKGROUND

Natural hazards and climatic extremes, like hurricanes, earthquakes, floods and storm surge can cause significant disruption of health services and economic losses. Downtime, during and after an extreme event, limits the ability of health facilities to provide emergency care to victims and ongoing healthcare for their communities.

Many health facilities in the Caribbean are located in areas of high risk and need strengthening in the face of repeated damage or increasing climate threats. Health care facilities can also be large consumers of energy, with a significant environmental footprint. With energy prices in the Caribbean among the highest in the world, savings could be better used on improving services.

The 'Smart Health Care Facilities in the Caribbean' project, funded by the UK Department for International Development (DFID) was implemented by PAHO/WHO in partnership with the Ministries of Health in target countries. A regional building code annex, guideline and toolkit for retrofitting existing or new facilities was developed and tested in two countries. The toolkit provides a step by step guide and includes the Hospital Safety Index (HSI), Baseline Assessment Tool (BAT), Green Checklist and utilises cost-benefit analysis to support investment decision making. Scale up of the project, also supported by DFID, will be implemented in seven (7) Caribbean countries: Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia and Saint Vincent and the Grenadines.

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- Media.

For more information, please visit: www.paho.org/disasters/caribbean



Making Healthcare Facilities in the Caribbean **SMART**

A platform for integrating Disaster Risk Reduction, Climate Change Adaptation, Environmental Management, and Conservation Efforts

RESILIENCY

SAFE

- Sound Roof & Foundation
- Improved Security & Signage
- Secured Equipment & Fuel Storage
- Protected & Efficient Doors and Windows
- Good Drainage
- Back-up Power
- Water Reserve
- Disaster Management Plans
- Comprehensive Maintenance Planning
- Disability Access



SMART HOSPITAL

Hospital safety Index –Score A
Green checklist –Scores above 70%

ENVIRONMENTALLY SOUND

GREEN 70⁺

- Water Efficiency
- Waste Minimization & Management
- Pollution Reduction
- Rain Water Harvesting
- Alternative Power Using Renewable Energy
- Efficient Lighting & Cooling
- Improved Indoor Air Quality



SUSTAINABILITY

SMART

- Reduced Downtime
- Resilient Structure
- Reduced Operating Cost
- Improved Safety
- Satisfied Patients and Staff
- Environmentally Sound Operations
- Improved emergency care and services for the community



Smart Healthcare
Facilities in the Caribbean

Providing safer greener
health facilities to deliver
care in disasters



Implemented by: Pan American Health Organization (PAHO/WHO)
Funded by: the UK Department for International Development (DFID)