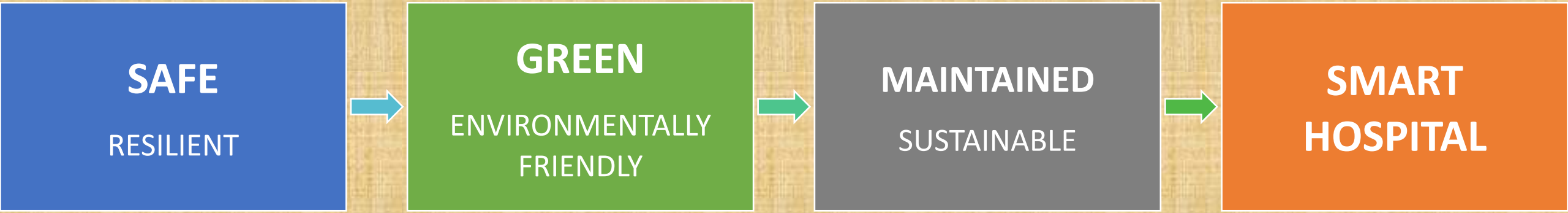


Smart Hospitals tools and techniques in practice



Presentation by Judith Harvey, PhD for the PAHO / Health Canada workshop on Building Climate Resilient Health Systems for Health Sector Decision Makers

THE SMART FORMULA



- Strengthen building and infrastructure; improve operational aspects
- Minimize downtime

- Implement green technologies


- Plan and execute preventative maintenance



- Improve healthcare services
- Reduce operational and rebuilding costs



Smart Tools available online

- Hospital Safety Index – vulnerability assessments inform the scope of retrofit
- Green checklist – opportunities for generating savings and reducing carbon
- Technical Guidance documents including
 - Preventive Maintenance Manual
 - CAT 5 resistant roofs
 - Model Policy and Case studies




PREVENTIVE MAINTENANCE MANUAL

FOR SMALL HEALTH CARE FACILITIES
(Non-medical equipment)

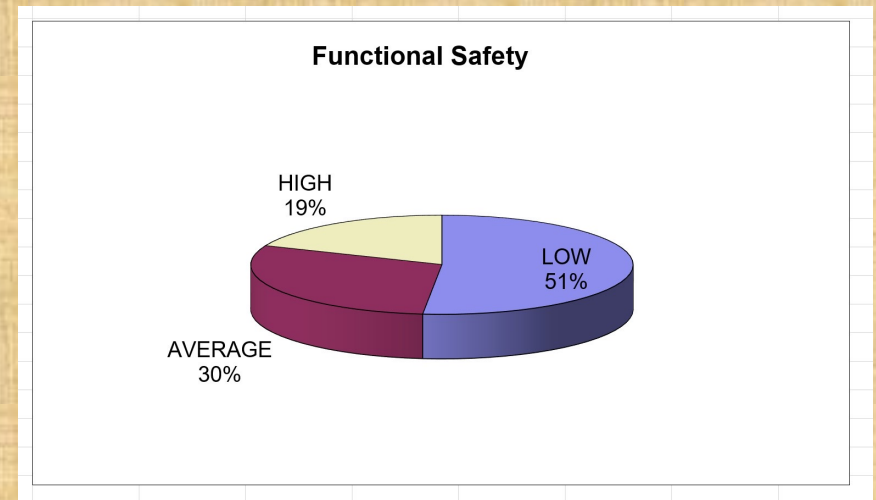
**MECHANICAL
ELECTRICAL
PLUMBING
BUILDING**

Prepared by:
Roger A. Camacho, P.E.

May 2017

INSTRUCTIONS: INSERT THE NUMBER "1" INTO THE ANSWER CELL FOR EACH QUESTION TO CALCULATE THE GREEN SCORE. INSERT COMMENTS.
Cells highlighted in Yellow are critical standard questions, which must be met by the facility in order for it to be certified as Green.

Theme	Title	Question/Intent	Answer			Comments	Question Weight	Score Achieved	Contribution to Total Points	Institutional Type (Referral Hospital, District Healthcare, Day Clinic, Health Center, Nursing Home, Psychiatric Hospital)							Critical Standard
			NA	YES	NO					OH	CH	PC	NH	PH			
1. Water Conservation Planning	1.1	1. Does the facility implement a water conservation plan? (Please provide copy of plan)					1	0	1	X	X	X	X	X	X	X	X
		Is plan updated regularly?					1	0	1	X	X	X	X	X	X	X	X
		2. Do you educate and involve staff in water conservation?					2	0	2	X	X	X	X	X	X	X	X
		3. Do you have water meters throughout the facility (Please provide meter readings)					2	0	2	X	X	X	X	X	X	X	X
1.2	1.2	4. Are drawings available that show all water using sources (bathrooms, sinks, washing machines, HVAC, cooling, sterilizers)? Please provide copies to evaluators.					2	0	2	X	X	X	X	X	X	X	X
		5. Are low-volume water fixtures installed throughout the facility?					3	0	3	X	X	X	X	X	X	X	X
		6. Do you actively detect leaks... and repair them immediately?					1	0	1	X	X	X	X	X	X	X	X
		7. Does the facility use water efficient washing machines and dishwashers?					2	0	2	X	X	X	X	X	X	X	X
Efficiency					2	0	2	X	X	X	X	X	X	X	X	X	



PAHO implemented the Smart Concept during the period 2015 to 2023 in seven countries and various types of health facilities



Medical Stores building

Not retrofitted – Dominica
Retrofitted in Grenada
Serves the entire country



Comfort Bay Senior Citizens' Home

Retrofitted - St Lucia
For the elderly



Palm View Centre

Retrofitted – Belize
For the mentally challenged

Smart Project results and achievements

OPT1: Assessments & Training

- **Over 400 health facilities** assessed (large database to guide future investments)
- Technical guidelines & case studies online
- Focus on **maintenance**
- **Contingency** plans

OPT2: Design & Retrofitting

- **55 facilities retrofitted** by 31 Dec. 2022 (110% of original target)
- **6 full designs facilities** handed over to the Ministries of Health

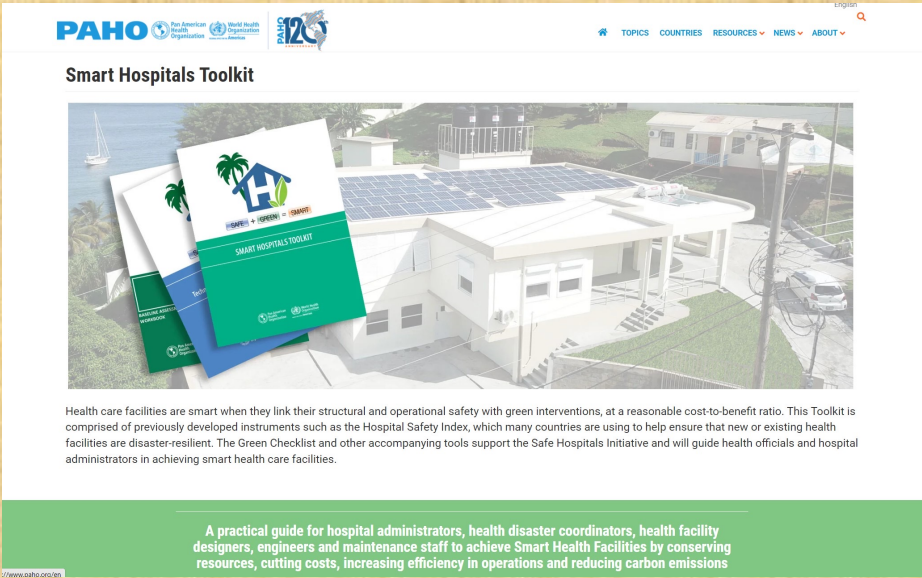
OPT3: PR / Advocacy

- **Smart concept expanded & adopted** by other sectors (education, tourism, shelters)
- Active **outreach & engagement directly within the communities** (billboards, banners, videos)

Current activities creating climate resilient and low carbon health systems

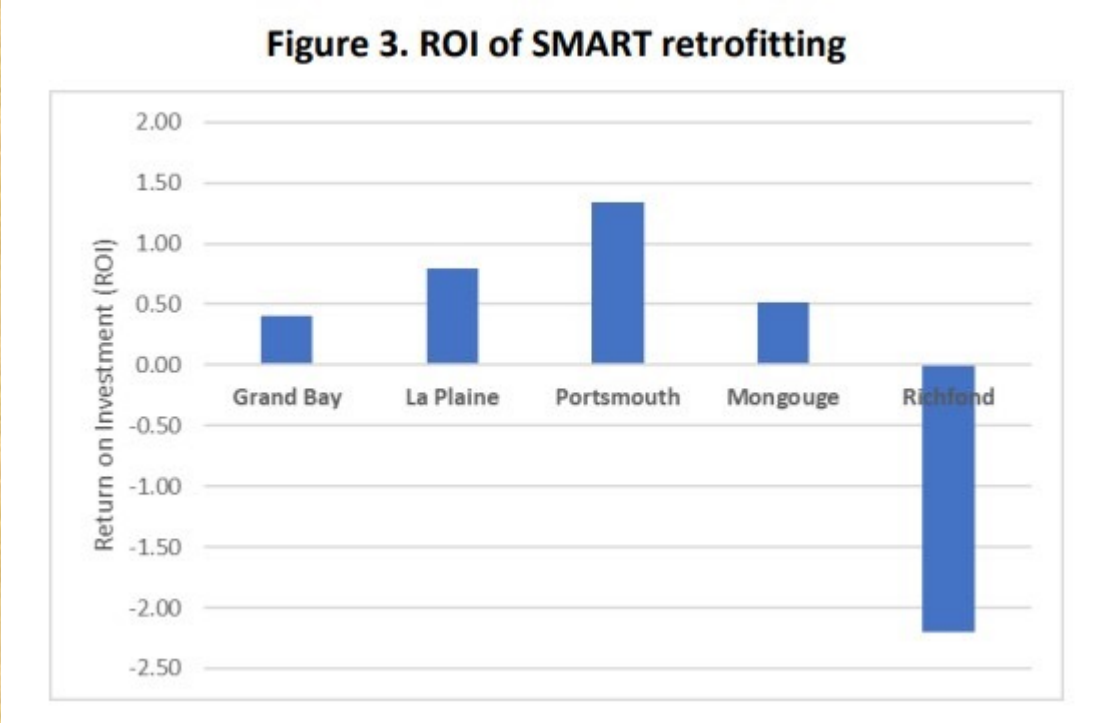
- Engagement of national partners and increasing knowledge of the smart concept.
 - Adaptation Planning
 - Risk assessment with the STAR tool
 - Updating Contingency Plans
- Application of smart concept in other countries and sectors, by other donors
- New facilities that are built to the Smart concept
- Sharing lessons learned in response to interest from the private sector
- Maintaining the investments made in retrofitting

New tools and best practice for vulnerability assessments



Electronic database with the spatial distribution of assessment results

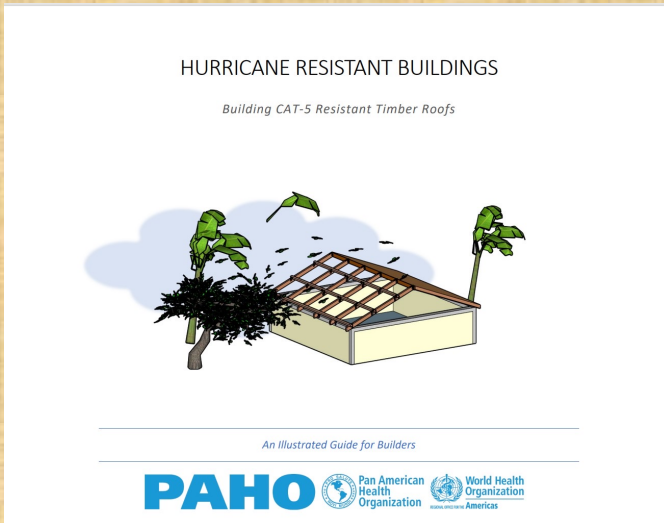
The SMART App by PAHO



Vulnerability assessment must result in a cost effective outcome

The REST tool by Florida International University

New tools and best practice for retrofitting and adaptation to climate change



New tools are **tailored to the characteristics and available resources** in the Caribbean Health Systems.

Check Consultants encourage the adoption of best practice on a routine basis

Resilience building must encompass a **multi-hazard approach** including extreme weather events.

Constructing climate resilient and low-carbon health facilities that address the needs of vulnerable populations





Bexon Wellness Centre



St Lucia

SMART HOSPITAL PROJECT IN ST. LUCIA

Providing safer, greener health facilities to deliver care in disasters






3 facilities: full Smart retrofit
1 facility: full Smart design only
12 facilities: Smart upgrades



- 3** solar panel systems installed (total 74.7 kW)
- 13** generators installed (total KVA 269)
- 47,000** gallons of potable water storage provided
- 39,000** gallons of rainwater storage provided
- 148** females trained 
- 71** males trained 
- 220** hurricane shutters installed
- 375** meters of underground cabling

Catchment population 178,696


Vulnerable groups:


-  Elderly: 10,500
-  Children: 45,000

Annual savings

-  Water: 122,544 gallons / US\$ 1,218
-  Electricity: 114,264.92 kWh / US\$ 34,046.17

Total investment for design and retrofitting in St. Lucia is USD 4,333,999.29

 Location of facilities in St. Lucia



Inclusive training, and capacity building that focuses on participation by the learners



**Maintenance training
by PAHO Smart Project**



**Generator training
by MD Electric**



**Fire Safety training by St
Lucia Fire Service**

A climate resilient facility **reduces the negative effects** on people's health caused by emergencies and disasters, **reduces the damage to health infrastructure**, and the **disruption of health services**.



**La Soufriere Volcanic
Eruption**
Saint Vincent



Paramakatoi Smart Health Centre
Guyana



Safety



Sustainability



Inclusiveness



Adaptability



Flexibility



PAHO

Pan American
Health
Organization



PAHO
120th
ANNIVERSARY

World Health
Organization
REGIONAL OFFICE FOR
AMERICAS

The sneeze guard at La Croix Wellness Centre is an example of improving safety, sustainability, and adapting to Covid-19



Thank you!



This material presented by Judith Harvey is drawn from work done by members of the Smart Project Technical Implementation Team including:

Dana van Alphen, Clemens Buter, Roger Camacho, Lealou Reballos, Rosario Munoz, Shalini Jagnarine-Azan, Rawle Jordan, Julien Baptiste, Alejandro Arrieta, Adrianus Vlugman, Tony Gibbs

The Smart Hospitals project was financed by the UK Foreign Commonwealth and Development Office and implemented by PAHO in cooperation with the local Ministries of Health in Belize, Dominica, Grenada, Guyana, Jamaica, St Lucia and St Vincent and the Grenadines

References:

www.paho.org/en/health-emergencies/smart-hospitals/smart-hospitals-toolkit

Arrieta Alejandro, et al. Dec 2019. The Retrofitting Economic support Tool. An Economic evaluation of Smart retrofitting of healthcare facilities

Arrieta Alejandro, et al. June 2022. REST Application for SMART facilities post retrofitting
Dept of Health Policy and Management. Florida international university (FIU). Miami, FL, USA