



POST-WORKSHOP REPORT

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# RAINWATER HARVESTING

CLIMATE AND WATER QUALITY RISK ASSESSMENT & DESIGN FOR IMPROVING HOUSEHOLD WATER SECURITY

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PILOT PROGRAMME FOR CLIMATE RESILIENCE (PPCR),  
University of the West Indies,  
Mona





POST-WORKSHOP REPORT

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# RAINWATER HARVESTING

CLIMATE AND WATER  
QUALITY RISK ASSESSMENT  
& DESIGN FOR IMPROVING  
HOUSEHOLD WATER  
SECURITY

**CLIENT:**

CARIBBEAN REGIONAL TRACK OF THE PILOT PROGRAMME FOR  
CLIMATE RESILIENCE (PPCR), UNIVERSITY OF THE WEST INDIES  
MONA/CARIBBEAN PUBLIC HEALTH AGENCY

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# 1 INTRODUCTION

A one-day workshop entitled, “Rain Water Harvesting – Climate and water quality risk assessment & design for improving household water security” was held on December 16, 2019 at the Department of Fisheries Conference Room, Sans Souci, St. Lucia. The workshop was hosted by the Caribbean Regional Track of the Pilot Programme for Climate Resilience (CRT-PPCR) in collaboration with the Caribbean Public Health Agency (CARPHA) through the GWP Consultants. Theobalds Consulting Limited, the local consultants, executed the event. This report presents a summary of the workshop proceedings as well as feedback from the attendees.

“A one-day workshop entitled, “**Rain Water Harvesting – Climate and water quality risk assessment & design for improving household water security**” was held (in) St Lucia”



## 2 WORKSHOP OVERVIEW

A total of 29 invitations were sent; 13 to attendees of the previous two workshops and 16 to a variety of professional organizations, government ministries and contractors. Follow-up calls were done and 21 persons were eventually confirmed for the workshop, however, 15 attended. The decrease in attendance numbers could be attributable to the prior holiday weekend in addition to the placement of the workshop within the week before Christmas. Despite the lower than expected numbers, the attendees were engaging and open, which resulted in a successful workshop.

Attendees received quite well, the Risk assessment checklist and the Engineers in the group expressed their excitement with the excel tool. For a few, this workshop was their first introduction to Rain water harvesting (RWH) and consequently, whilst intrigued by the content of the presentations, was expecting more of a “how to” guide to RWH.

*Photos taken during the seminar are presented in Appendix 5.3.*



## 3 DISCUSSIONS

Throughout the day, numerous discussions ensued with the following points being highlighted.

- ▶ RWH demos have been installed in a number of health facilities however they do not remain effective due to lack of regular maintenance.
- ▶ RWH as a climate resilience measure was exhibited in 2010 when during the aftermath of Hurricane Tomas, health centers with RWH systems were the only ones able to function.
- ▶ Periodic testing of treated rainwater should be considered to ensure that the households are accurately and effectively treating the collected water for drinking. CARPHA and Ministry of Health were cited as potential agencies to be responsible for the testing.
- ▶ Households should also be made of the need to implement conservation measures to ensure that the collected water is used in an efficient manner and not wasted.
- ▶ A recommendation was made to include the installation of a RWH system as a requirement for DCA approval. Alternatively it could be included in the building code.
- ▶ Plumbing installation should require inspection and certification akin to the existing process of electrical inspection and certification prior to getting connected to the electrical grid.
- ▶ To encourage replication and “buy-in” to the RWH movement, incentive programs need to be activated. e.g. income tax deduction when installed (similar to the solar water heaters) or waiver of duties for RWH materials / components.
- ▶ Integrity of the roof needs to be ensured prior to the installation of a RWH system.
- ▶ Maintenance plans are imperative as RWH risks are not static - they require regular assessment and revision.
- ▶ The potential location for the demo project was discussed. Attendees proposed the use of a school as demos have been done on health facilities. Also, through the use of the school it would encourage education and public awareness of RWH.

## 4 ATTENDEES SURVEY

At the end of the workshop, attendees were given a feedback form to complete. 12 forms were returned which can be in Appendix 5.4.

Overall, the seminar was well received, with participants giving positive feedback. Participants were satisfied with the quality of the seminar, the presenter and the content. A more detailed analysis of the feedback forms is provided in Appendix 5.4.



# APPENDIX 1

## INVITEES LIST

AGENCY	CONTACT PERSON	EMAIL
<b>Water and Sewerage Company Inc (WASCO)</b>	Jean Farrell	jeanfarrell@wascosaintlucia.com
<b>Water and Sewerage Company Inc (WASCO)</b>	Shantal Gaston	shantalgaston@wascosaintlucia.com
<b>Ministry of Physical Planning</b>	David Alphonse	dalphonse@gosl.gov.lc
<b>Department of Sustainable Development</b>	Snaliah Mahal	snaliahmahal.sde@gmail.com
<b>Department of Equity</b>	Lenita Joseph	ljoseph@gosl.gov.lc most@gosl.gov.lc
<b>Saint Lucia Meteorological Services (SLMS)</b>	Andre Joyeux	andre.joyeux@govt.lc
<b>Ministry of Physical Planning</b>	Suzanna Aurelien	saurelien@gosl.gov.lc
<b>Caribbean Water &amp; Sewerage Association Inc (CAWASA)</b>	Ignatius Jean	ijean@cawasa.org
<b>Water Resource Management Agency (WRMA)</b>	Jason Ernest	jason.ernest@govt.lc; jasonernest2000@yahoo.com
<b>Water and Sewerage Company Inc (WASCO)</b>	Peter Norville	peternorville@wascosaintlucia.com
<b>Central Statistics Office</b>	Linn Brown	linnbrownn@gmail.com; linn.brown@govt.lc
<b>Central Statistics Office</b>	Uranda Xavier	uranda.xavier@govt.lc
<b>Central Statistics Office</b>	Sean Mathurin	sean.mathurin@govt.lc
<b>Ministry of Infrastructure</b>	Ivor Daniel	ps.infrastructure@govt.lc
<b>Ministry of Housing</b>	Agosta Degazon	gaugustin@gosl.gov.lc
<b>Ministry of Physical Planning</b>	Hildreth Lewis	hildreth.lewis@govt.lc plionel@gosl.gov.lc
<b>Ministry of Health and Wellness (Environmental Health - Vector Control Officers)</b>	Cyprian Felix St. Hill	environmental.health@govt.lc

AGENCY	CONTACT PERSON	EMAIL
<b>National Emergency Management Organisation (NEMO)</b>	Dorine Gustave	dgustavee@gosl.gov.lc
		mmedard@gosl.gov.lc
<b>Saint Lucia Institute of Architects</b>	Jeremiah Phulchere	SLIA.SLU@GMAIL.COM
<b>Association of Professional Engineers of St. Lucia</b>	Joe Lindberg	engineers.stlucia@gmail.com
<b>Prudy's Construction Services Ltd</b>	Prudence Montrope	prudencemontrope@gmail.com
		pertrusedward@hotmail.com
<b>Construction &amp; Industrial Equipment Ltd (CIE LTD)</b>	Anselm Clauzel	aclauzel@cie-rgltd.com
<b>Integrated Development &amp; Construction Ltd (IDC LTD)</b>	Emma Charles	emma@idcslu.com
<b>R &amp; F Construction Ltd</b>	Randolph Mater	r_fconstruction@hotmail.com
<b>J A Kyle Construction Ltd</b>		jakyleconstruction@gmail.com
<b>BLD Designs</b>	Larry Shepherd	bldesigns.es@gmail.com
<b>RECS General Contractors</b>	Winston Cyril	winstoncyril@gmail.com
<b>Rene's Construction</b>	Martin Renee	renee.construct@gmail.com
<b>Kurt's Construction Inc.</b>	Kimron Mondesir	kurtsconstructioninc@gmail.com

# APPENDIX 2

## ATTENDANCE REGISTER



Rainwater Harvesting

Climate and Water Quality Risk Assessment & Design for Improving Household Water Security

Last Name	First Name	Company	Email	Contact #
SHEPHERD	LACEY	B Designs	bldecisions.cs@gmail.com	714-1785
GRABSTON	CHANTAL	W.A.S.C.O.	Shantalgrabston@wascosaintlucia.com	5190913
ALPHONSE	DAVID	PHYSICAL PLANNING	dalphonse@gost.gov.lc	4685545/7157922
BROWN	LINN	CSO	linn.brown@govt.lc	4681577
FELICIEEN	Letha	CSO	letha.felicieen@govt.lc	4681561
BEGIS	HUMPHREY	ARCH. SECTION	humphrey-regis@wascosaintlucia.govt.lc	285-7921
EDWARD	PETRUS	PRUDY'S CONSTR.	Petrusedward@hotmail.com	461-0175
ELEANOR	KOOSOR	E.H.D.	koosor@gmail.com	2852397
THOMPSON	MALIKA	CARPHA (EHSD)	thompsonm@carpha.org	484-4240
ERNEST	JASON	NRMA	Jason.ernest@govt.lc	724-5479
JOSEPH	SHEMMA	Met Services	shemmaleuce@gmail.com	7181117
HONDESIR	Giselle	ITC	giselle.hondesir@gmail.com	7245112
HARTE	Hubert	Infrastructure	hubert.harte@govt.lc	7209457
ISAACS	BRADLEY	CARPHA	isaacsbr@carpha.org	7172313



# APPENDIX 3

## PHOTOGRAPHS





# APPENDIX 4

## FEEDBACK FORMS

## BREAKDOWN OF RESPONSES FROM EVALUATION FORMS

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The workshop met my expectations.	4	8	-	-	-
2. I will be able to apply the knowledge learned.	8	3	1	-	-
3. The material covered is useful.	6	6	-	-	-
4. The material presented is beneficial to promoting the implementation of RWH.	9	3	-	-	-
5. The information outlined in the Introduction to Rainwater Harvesting Component Design was clear and informative.	8	4	-	-	-
6. The information outlined in the Quality Approach to RWH climate & water risk assessment was clear and informative.	8	4	-	-	-
7. The information outlined in the Quantity Approach to RWH climate & water risk assessment was clear and informative.	8	3	1	-	-
8. The information outlined in the practical approach to tank sizing and drought risk reduction was clear and informative.	4	8	-	-	-
9. The excel calculator for sizing rainwater tanks was clear and easy to use.	6	5	1	-	-
10. The presentations and materials were pertinent and useful	5	7	-	-	-
11. The quality of instruction was good.	8	4	-	-	-
12. The instructor responded well to questions.	8	4	-	-	-
13. Time management was good.	10	2	-	-	-

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
How do you rate the course overall?	6	6	-	-	-

	Yes	No
Was this your first introduction to rain water harvesting?	5	7

	Male	Female
Gender	8	4



## RAINWATER HARVESTING

### Climate and Water Quality Risk Assessment & Design for Improving Household Water Security

### PARTICIPANT EVALUATION

Location: SAINT LUCIA

Date: 16 DECEMBER 2019

Participant evaluations are a vital part of monitoring the training program. Without feedback from you, it is impossible to refine and improve the training. Please answer this anonymous and confidential questionnaire as carefully as possible.

Please indicate your impressions of the items listed below.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<b>Training Programme and Content</b>					
1. The workshop met my expectations.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I will be able to apply the knowledge learned.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The material covered is useful.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The material presented is beneficial to promoting the implementation of RWH.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The information outlined in the Introduction to Rainwater Harvesting Component Design was clear and informative.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The information outlined in the Quality Approach to RWH climate & water risk assessment was clear and informative.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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9. The excel calculator for sizing rainwater tanks was clear and easy to use.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The presentations and materials were pertinent and useful	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Quality of Presentations

11. The quality of instruction was good.
12. The instructor responded well to questions.
13. Time management was good.

General

20. How do you rate the course overall?

- Excellent       Good       Average       Poor       Very poor

21. What aspects of the training could be improved? Please make recommendations

-Increase on the number of training workshops to the relevant stakeholders.

Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

THANK YOU FOR YOUR PARTICIPATION!



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20. How do you rate the course overall?

- Excellent       Good       Average       Poor       Very poor

21. What aspects of the training could be improved? Please make recommendations

I WANTED MORE INFORMATION ON TREATMENT, BUT WAS EXPLAINED IT WAS DONE AT A OTHER SEMINAR.

### Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

THANK YOU FOR YOUR PARTICIPATION!



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**Climate and Water Quality Risk Assessment & Design for  
 Improving Household Water Security**

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21. What aspects of the training could be improved? Please make recommendations

updating rainfall data used in the calculator  
for sizing rainwater tanks

Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  
 No

THANK YOU FOR YOUR PARTICIPATION!





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Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

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12. The instructor responded well to questions.
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### General

20. How do you rate the course overall?

- Excellent  Good  Average  Poor  Very poor

21. What aspects of the training could be improved? Please make recommendations

- use of the excel calculator for sizing in a more practical manner. maybe include an exercise/simulator to generate graphs -

- visibility of slides could be improved

### Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  
 No

THANK YOU FOR YOUR PARTICIPATION!



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Quality of Presentations

11. The quality of instruction was good.
12. The instructor responded well to questions.
13. Time management was good.

General

20. How do you rate the course overall?

- Excellent  Good  Average  Poor  Very poor

21. What aspects of the training could be improved? Please make recommendations

If any I would like to see some more specifics on the system designs. But very good presentation.

Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

THANK YOU FOR YOUR PARTICIPATION!



**RAINWATER HARVESTING**

**Climate and Water Quality Risk Assessment & Design for  
 Improving Household Water Security**

**PARTICIPANT EVALUATION**

Location: SAINT LUCIA

Date: 16 DECEMBER 2019

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21. What aspects of the training could be improved? Please make recommendations

*More interactive presentations.  
Better power ~~point~~ presentations needed.*

Participant profile

Male

Female

Was this your first introduction to rain water harvesting?

- Yes  No

THANK YOU FOR YOUR PARTICIPATION!





**RAINWATER HARVESTING**  
**Climate and Water Quality Risk Assessment & Design for**  
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**General**

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- Excellent       **Good**       Average       Poor       Very poor

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A working example by Participants. i.e Participants calculate the volume of water needed by a house hold.

**Participant profile**

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

**THANK YOU FOR YOUR PARTICIPATION!**



## RAINWATER HARVESTING

### Climate and Water Quality Risk Assessment & Design for Improving Household Water Security

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Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

**THANK YOU FOR YOUR PARTICIPATION!**



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NONE

**Participant profile**

- Male  Female

Was this your first introduction to rain water harvesting?

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THE USE OF THE RAW WATER HARVESTING SHOULD BE TAILORED FOR SPECIFIC REGIONS OF THE ISLANDS.

Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

THANK YOU FOR YOUR PARTICIPATION!





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~~The~~ Video presentation would be a add on for better clarification & demonstrating how these components come together, also to show how the effect of climate change would greatly impact such a system.

Participant profile

- Male  Female

Was this your first introduction to rain water harvesting?

- Yes  No

THANK YOU FOR YOUR PARTICIPATION!









**The Program Management Unit – Investment Plan for the Caribbean Regional Track PPCR**  
Mona Office for Research and Innovation  
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