



**Consultancy for
Climate Change,
Water Infrastructure
Vulnerability and
Biosecurity Certificate
Water Sector
Resilience Nexus for
Sustainability (WSRN-
S) in Barbados**



MARCH 2023

D7 REPORT

CERTIFICATION OF 250 PERSONS

WSRN- S PROJECT
CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE

TABLE OF CONTENTS

INTRODUCTION	2
WSRN-S WATER INFRASTRUCTURE VULNERABILITY, CLIMATE CHANGE & BIOSECURITY TRAINING - BARBADOSFIRE SERVICE	5
LESSONS LEARNT	5
FEEDBACK	6
APPENDIX 1 - TRAINING DATES & ATTENDANCE.....	8
APPENDIX 2 - SNAPSHOTS OF TRAINING PARTICIPANTS.....	10

INTRODUCTION

The Centre for Biosecurity Studies (CBS) was successful in securing a consultancy as part of the multifaceted Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados), project in Barbados which is funded by the Green Climate Fund (GCF) and facilitated by the Caribbean Community Climate Change Centre (CCCCC).

This consultancy specifically seeks to train and certify 500 persons inclusive of Barbados Water Authority staff and other allied government agencies in Climate Change, Biosecurity and Water Infrastructure Vulnerability. Dr. Karl Payne, a hydrogeological engineer, with Centre for Environmental Resource Management Studies (CERMES) was the other key team member.

The main objective of the WSRN S-Barbados project is to transform Barbados' society into one that is more aware of the water cycle, and the climate change impacts which are threatening the island's drinking water supply; create resilience to severe weather impacts; reduce greenhouse gas emissions; reduce consumption; promote appropriate uses of diverse water sources and encourage legislation to support climate smart development and water sector resilience.

According to the Project's Biosecurity Action Plan (BAP), WSRN S-Barbados will mainstream biosecurity into all activities – foster utility/university/community/private sector partnerships, promote stakeholder engagement, exchange knowledge, build workforce and support entrepreneurship opportunities – to increase resilience of people and the water sector of Barbados to climatic natural disasters like droughts, tropical storms, and hurricanes.

At the July 25, 2022, launch of the certificate programme, Director of the Centre for Biosecurity studies at University of the West Indies (Cave Hill), Dr. Kirk Douglas, underscored the importance of interrelatedness of climate, biosecurity,

and water infrastructure vulnerability and how biosecurity examines these cross-cutting themes of the overall.

At the July 25, 2022, launch of the certificate programme, Director of the Centre for Biosecurity studies at University of the West Indies (Cave Hill), Dr. Kirk Douglas, underscored the importance of interrelatedness of climate, biosecurity, and water infrastructure vulnerability and how biosecurity examines these cross-cutting themes of the overall initiative, due to the cascading impacts of climate change. Biosecurity approaches can be effective in considering varied perspectives to a singular issue such as climate change and its impact on water infrastructure vulnerability, water availability, water demand and water quality. The inescapable link of water resources with fires was highlighted and illustrated why Barbados Fire Service was one of the first allied agencies to include within this certificate training. Forging closer ties between the BWA and the Barbados Fire Service is one projected aim of this training as it allows smoother communications and sharing of information, data, experience, and expertise.

"Climate change in the Caribbean poses an existential threat which will result in more frequent and severe weather extremes, from flash flooding from intense rainfall events, storms and hurricanes, sea level rise, to drier conditions which will cause higher temperatures, heatwaves, drought, and wildfires. Understanding how these climate impacts can influence water infrastructure vulnerability and lead to subsequent public health threats of several vector-borne and water-borne infectious diseases and non-communicable diseases is vital, for current and future resilience and participation in decision-making for BWA and allied organisations which manage and utilise Barbados's precious water resources" said Dr. Douglas in his remarks.

“The BWA staff remain the key knowledge experts due to their extensive experience and intimate knowledge of the country’s water challenges which face the citizens and residents of Barbados. Yet the staff of other allied agencies such as the Barbados Fire Service also possess complementary experience and knowledge to the BWA to assist in effective water resource management. It reflects an understanding that cross-cutting issues such as climate change and water resource management requires multisectoral and multiorganizational approaches to disseminate information, experience, and expertise to facilitate effective resource allocation, use and management. Taking down institutional silos facilitates rapid interaction and dialogue which can create comprehensive solutions to existing challenges and problems among agencies.”

A summary video of the certificate training was shown at the beginning of the training session to cover the key issues that will be explore within the training.



To promote this WSRN-S training a competition was held to make BWA staff aware of the activity and what it all entails. Persons were asked to submit videos (up to 45 seconds in length) indicating how climate change has affected them in their day to day lives at home, at work or in general. Mr. Nicholas Kirton submitted his video and won a supermarket voucher for \$100 Barbados dollars. Congratulations to Mr. Kirton for his participation and on winning his prize.



Mr. Nicholas Kirton (Left, BWA Engineer) and Dr. Kirk Douglas (Director, CBS). Winner of the WSRN-S biosecurity training video competition among BWA staff presented with a \$100 supermarket voucher.

WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS FIRE SERVICE

WSRN-S training for the Water Infrastructure Vulnerability, Climate Change and Biosecurity Certificate was conducted with participants from the Barbados Fire Service during July, November and December 2022, and January and February 2023 by the CBS Team.

At the end of 2022 CBS Team trained a total of 276 persons - 171 males and 105 females (target was 250 persons) by end of February 2023 from the Barbados Fire Service (BFS) with the Climate Change, Water Infrastructure Vulnerability and Biosecurity Certificate Training as part of the WSRN-S project. We are aiming to train 500 persons in total. For modules 1 and 2 covered the hydrological (water) cycle, the global and regional picture on water availability in the face of a changing climate, climate change impact of water availability, water demand and also water quality, the salient features of Barbados' water resources and the various factors that influence water resource management.

For module 3, the local research conducted on climate and wildfires in Barbados was delivered as it pertained directly to the Barbados Fire Service but a clear impact on how their activities influence water demand, water use and possibly water availability at the time of the year when water resources are particularly strained (dry season) was vital. Understanding the varied challenges the Barbados Fire Service faces in water access and availability as a national emergency response unit was necessary to permit the Barbados Water Authority to pinpoint potential areas of not only improvement but strong collaboration. Data on historical water use estimates for wildfires was conducted by Centre for Biosecurity Studies (CBS) and shared with training participants.

Module 4 examined the impact of the 'wet' side of climate change, the influence of La Nina and ENSO cycle, floods, cyclones, storm surge and sea level rise and how collectively they impact on Barbados' water resource management from the supply and demand sides including corrosion of subterranean water pipes and mains, salt water intrusion, and infectious disease risks (cholera, leptospirosis, dengue, Zika etc.), floodwater dangers/risks.

Module 5 specifically covered the drier side of climate change exploring El Nino impact, droughts, heatwaves, rising temperatures, wildfires and Sahara dust activity. The measures taken by BWA to combat the negative impacts of both the 'wet' and 'dry' sides of climate change were explained with Water Wednesdays video clips preceded with a review of the key concepts such as salt water intrusion, check dams, effect of drought on water pumping stations based on inland or coastland locations, hurricane preparedness for homeowners and the process which the BWA has to undertake to restore water distribution after a major weather event.

Lessons Learnt

There were quite a few lessons learnt after training the first tranche of 250 participants.

These included:

- 1) Virtual training was not as highly desired as in-person training for participants from Barbados Fire Service. This likely impacted the low turnout in July and November 2022.
- 2) To achieve good consistent attendance of 20-30 persons, a request for 40-50 persons should be made.
- 3) Never request the exact number of training participants you desire to attend.
- 4) Previewing important points of the training videos permit persons the ability to key in on important takeaways.

5) Pauses are necessary to discuss and allow robust interactions.

6) A desire to forge a closer relationship between BWA and Barbados Fire Service was expressed by several training participants to improve communications and collaboration in the future.

7) Flexible catering options are necessary to allow minimalisation of food waste and expense. Arrangements were made to supply break for the requested numbers but an updated number was communicated to catering for lunch with the actual numbers attending the training.

The extensions of the training to the Barbados Fire Service was helpful in showcasing the interrelatedness of water resource management and fire hazard management in Barbados. Further training with Barbados Fire Service staff can only augment training and dissemination of information throughout communities and assist BWA with national water resource management in the face of climate change.

Barbados Fire Service

There is a vital importance of BWA service to firefighting efforts on the island. Over the sessions of training with the Barbados Fire Service a number of key insights were collected that would be beneficial to the BWA. These included:

1) The inability of Barbados Fire Service to locate and access fire hydrants for the filling of fire tenders to respond to fire events. This may be due to several reasons including:

- a) hydrants are paved over by road works
- b) hydrants on road reserve paved over by property owners
- c) Low water pressure at certain hydrants (risk - slow response to fire event)
- d) hydrants after repaving of road are set too low which results in inability to access with Fire Service equipment

- e) Debris in hydrants (soil, silt, fine particles) can damage fire tender pumps. Also long flushing periods may or may not clear this problem up.
- f) Difficulty in locating functional hydrants at night. Some covers may be removed and the covers are not easily discernible at night. Suggestion of using roadmarking paint to make hydrants easier to identify.

2) Unable to estimate potable water collected for firefighting - plans to measure this non-revenue water are in progress

3) Barbados Fire Service can assist with hydrant marking and GIS location marking as they conduct weekly checks of hydrants all over the island.

4) Barbados Fire Service can assist with well locations as they perform well rescues all over the island. This could aid in BWA's effort to map existing wells across the island.

Pipe leak distribution mapping by BWA is currently being developed and would be very beneficial for potential public health links for mosquito-borne, water-borne and rodent-borne diseases such as dengue, Zika, Chikungunya, leptospirosis, hantavirus fever, etc.

Feedback

Several training participants stated that they were initially unsure how this training would be of any benefit to them and their jobs in their informal feedback. These same participants (BWA and BFS) said however after the training they were pleasantly surprised with the content and the delivery of the topics, the wide ranging and interconnected nature of the topics and how they can impact water resource management either negatively or positively by their personal actions. They all said they had a much better understanding of the threat of climate change to water infrastructure vulnerability, biosecurity and water resource management. They particularly liked how these complex topics were simply presented so everyone could grasp the information and understand.

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WSRN-S
CLIMATE CHANGE, WATER INFRASTRUCTURE VULNERABILITY & BIOSECURITY TRAINING

DATES:
 FEBRUARY 23rd 2023
 MARCH 30th 2023
 APRIL 18th 2023

CLIMATE CHANGE RESILIENCE STARTS WITH YOU!

246-417-7467

<https://www.cavehill.uwi.edu/biosecurity/home.aspx>

The allotment of trained staff from BWA was set at 250 persons and the other remaining 250 persons were to be split between other allied government agencies such as Barbados Fire Service. In an effort to recruit persons from these allied agencies a promotional graphic was created to organise set training session dates and times for these persons. (See Above)

Appendix 1 Training Dates and Listing of Attendance

DATE	INSTITUTION	FACILITATOR(S)	PROPOSED PARTICIPANTS	CONFIRMED PARTICIPANTS		
				TOTAL	MALE	FEMALE
25 July 2022	Barbados Fire Service	Dr. Karl Payne Dr. Kirk Douglas	15	2	2	0
27 July 2022	Barbados Fire Service	Dr. Karl Payne Dr. Kirk Douglas	20	6	5	1
8 Nov 2022	Barbados Fire Service	Dr. Karl Payne Dr. Kirk Douglas	11	6	6	0
10 Nov 2022	Barbados Fire Service	Dr. Karl Payne Dr. Kirk Douglas	12	4	4	0
17 Nov 2022	Barbados Fire Service	Dr. Karl Payne Dr. Kirk Douglas	27	12	7	5
13 Dec 2022	Barbados Fire Service	Dr. Kirk Douglas	52	36	30	6
15 Dec 2022	Barbados Fire Service	Dr. Kirk Douglas	41	30	27	3
26 Jan 2023	Barbados Water Authority	Dr. Kirk Douglas	28	28	16	12
2 Feb 2023	Barbados Water Authority	Dr. Kirk Douglas	44	27	12	15
7 Feb 2023	Barbados Water Authority	Dr. Kirk Douglas	42	19	10	9
9 Feb 2023	Barbados Fire Service	Dr. Kirk Douglas Dr. Karl Payne	47	17	12	5
14 Feb 2023	Barbados Water Authority	Dr. Kirk Douglas	42	29	12	17
16 Feb 2023	Barbados Water Authority	Dr. Kirk Douglas	42	19	7	12
21 Feb 2023	Barbados Water Authority	Dr. Kirk Douglas	50	30	13	17

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DATE	INSTITUTION	FACILITATOR(S)	PROPOSED PARTICIPANTS	CONFIRMED PARTICIPANTS		
				TOTAL	MALE	FEMALE
23 Feb 2023	Barbados Fire Service	Dr. Kirk Douglas	43	11	8	3
CUMULATIVE TOTAL				276	171	105

Appendix 2

Snapshots of Training Participants at Varied Training Sessions

WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS FIRE SERVICE

Snapshots of WSRN-S training participants from the Barbados Fire Service in July, November and December 2022.



10th NOVEMBER 2022

In-person (Dr. Payne, Dr. Douglas and participants - Barbados Fire Service)

Appendix 2 Snapshots of Training Participants at Varied Training Sessions

WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS FIRE SERVICE

Snapshots of WSRN-S training participants from the Barbados Fire Service in July, November and December 2022.

17th NOVEMBER 2022

Hybrid delivery (Dr. Douglas), In-person (Dr. Payne and participants - Barbados Fire Service)



17th DECEMBER 2022

(Dr. Douglas), In-person and participants - Barbados Fire Service



WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS FIRE SERVICE

Snapshots of WSRN-S training participants from the Barbados Fire Service in July, November and December 2022.



13th DECEMBER 2022

In-person (Dr. Douglas and participants - Barbados Fire Service)



15th DECEMBER 2022

In-person (Dr. Douglas and Training participants - Barbados Fire Service)

WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS FIRE SERVICE

Snapshots of WSRN-S training participants from the Barbados Fire Service in July, November and December 2022.



WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS WATER AUTHORITY

Snapshots of WSRN-S training participants from the Barbados Water Authority in January and February 2023.



WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS WATER AUTHORITY

Snapshots of WSRN-S training participants from the Barbados Water Authority in January and February 2023.



WSRN-S Water infrastructure Vulnerability, Climate Change and Biosecurity Training - BARBADOS WATER AUTHORITY

Snapshots of WSRN-S training participants from the Barbados Water Authority in January and February 2023.

