

Curaçao

Climate Change Policy Assessment



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Foreword

The 2019 hurricane season will be remembered as the year of Hurricane Dorian crushing two islands of the Bahamas. Hurricane Dorian, as a major hurricane (category 5), stayed stationary over the islands of Great Abaco and Grand Bahama for at least 24 hours. The devastation was enormous. The death toll is about 70 and 280 people are still missing with an approximate damage of US\$3 billion. Curaçao was also forecasted to be in the path of Hurricane Ivan (category 5) in 2004 after passing over Grenada, causing 39 fatalities and US\$1 billion in damage there. Fortunately, this hurricane took a more northern track but dropped heavy rainfall over Aruba, causing widespread flooding and US\$1.1 million in infrastructural damage. On the other hand, in 2010 the extreme rainfall associated with a weak tropical storm Tomás accounted for two fatalities and an estimated material damage of US\$115 million in Curaçao.

Climate change projections indicate that the number of major tropical cyclones (category 3, 4 and 5) will likely increase due to climate change in the 21st century. Furthermore, rainfall associated with these tropical cyclones will likely increase in the future due to an increase in atmospheric moisture. For a 2° C global warming scenario, climate models project an increase in the order of 15% for rainfall

rates within a tropical cyclone. Future sea level rise will increase due to melting of the polar ice cap and expansion of a warmer ocean. The impact of storm surge on coastal regions will therefore increase during the close passage of a tropical cyclone.

Besides the increased damage that tropical cyclones can generate due to climate change, there are several other impacts due to climate change. Sea level rise will cause erosion, salt intrusion in the subterranean water reservoirs and inundations in the coastal areas, destroying the livelihood in the coastal zones (fisheries, hotels, ports, etc.). Extreme rainfall can cause destructive flooding in Willemstad and surroundings, but prolonged drought will also lower the ground water level and that will cause desertification of the island.

Due to a warmer climate, besides of heat waves that can cause heat strokes, more mosquitoes will be produced during the whole year and the outbreaks of vector-borne diseases will be more frequent (health sector). In this respect, the effects of climate change will impact the whole community of Curaçao. It is therefore essential to involve not only the government departments, but also the NGOs, academia and the private sector to develop mitigation and adaptation plans as recommended by the agreement of Paris at the COP 21.

As a first step, it is important to assess the capacity and knowledge of the stakeholders and



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to build a plan of action on this existing infrastructure. The objective is to study the adverse impacts of climate change for Curaçao, in order to develop adaptive measures which will reduce the vulnerability and enhance the resilience of Curaçao. In order to ensure the sustainability of this work, a Curaçao Climate Change Network will be established, consisting of members of the stakeholders, based on the success of the UN IPCC.

The Climate Change Committee Curaçao will remain committed to support disaster risk reduction, climate change mitigation and adaptation, and capacity development of national experts to assure a sustainable development of Curaçao.

Dr. Albert Martis
Director Meteorological Department Curaçao

Executive Summary

This report presents the key findings, recommendation and a path forward on how to address the impact of climate change in Curacao. As the discussion on the impact of climate change at national level has increased during the last years, the Meteorological Department Curaçao Meteorological Department Curaçao as one of the main actors regarding climate change matters received seed funding from the UNESCO to execute the project during 2018 and 2019. The main objective of that project was to enhance the resilience of Curaçao for the adverse impacts of natural hazards and the losses of biodiversity due to climate change by further strengthening the collaboration between the Government agencies, the private sector and the NGOs.

The islands of Curaçao, Aruba and Bonaire are on the southern fringes of the hurricane belt and up till now had experienced mainly the torrential rains and very rough seas of the hurricanes. Fortunately, the devastating hurricane force winds that can wipe out entire villages, were not registered on these islands. Besides the effects of tropical cyclones Curaçao also had to deal with severe weather, flash floods, coastal inundation droughts and heat waves outside the hurricane season.

Based on the assessment reports of the IPCC (an UN agency, Intergovernmental Panel for



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Climate Change) the impacts of climate change on small islands is considerably larger than its mainland counterparts, since islands are more vulnerable and cannot easily adapt to these changes. Therefore, the risks for natural hazards and biodiversity losses due to climate change for Curaçao are expected to increase during the upcoming decades. On the other hand, there are significant opportunities for Curaçao with its steady wind regime, sunny weather and steep shorelines. Curaçao can further develop its renewable energy sector based on these natural resources.

This report identifies several key areas where the different stakeholders can work to a common goal in order to reduce the vulnerability and enhance the resilience of Curacao.

Key results of the Survey

The main conclusions were that the respondents needed more information regarding the possible impact of climate change on national level. Due to a lack of information about the impact of climate change it was not possible to develop proper data and information that will be used for a science-based planning and decision-making process. They also indicated that guidance on the implementation of the adaptation strategies and assistance in overcoming various policy hurdles were the limiting factors. Lack of economic resources, institutional capacity and policy tools were the main reasons why several works in this area remained in the identification phase.

Moreover, there are many different planning mechanisms in the government agencies that deal with the different aspects of climate change, including roadmaps, risk profiles, SDGs and national development plans.

Key results of the Seminars

As a result, a list of focus areas was created and taken into consideration concerning the general needs in Curaçao and the working capacity of the stakeholders. The priorities in the area of mitigation were water and electricity, transportation on land and landfill. In the area of adaptation, the priorities were green infrastructure, water management and the building environment. Both groups indicated the need for a strong awareness campaign. This cross-cutting issue was also one of the key results of the survey. Furthermore, the participants elaborated on different aspects of a strategic planning cycle. This involved the activities to achieve a common vision, mission, the strategic objectives and the expected results in the areas related to climate change in Curaçao. All these items were building blocks for a road map on climate change.

Recommendations.

All of this will obviously lead to stronger requirements of large investments to guarantee sustained development in the near and distant future. A good coordination and collaboration among the government agencies, private companies and the NGOs therefore is essential and continual improvement of it, in order



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to prevent unnecessary deaths and severe interruption of the economy and loss of biodiversity.

Curacao Climate Change Road Map

The overall objective of this Road Map is to develop a Strategic Plan that includes major steps to reduce the vulnerability and enhance the resilience of Curacao for the adverse impacts of climate change. Furthermore, to build capacity of national experts and organizations in the fields related to climate change, in order to make its implementation sustainable at national level and enhance opportunities for our experts at international level. During the implementation of this Road Map, the collaboration between the government agencies, the private sector and the NGOs will be fortified and guiding principles for the development of the national mitigation and adaptation plans will be established. In order to accomplish this plan, a Curacao Climate Change Network (CCCN) will be established with the objective to facilitate a scientific and/or evidence-based platform for the harmonization of expertise related to the adverse impacts of climate change, its mitigation and adaptation options for Curacao.

Introduction

The hurricane seasons of the last couple of years had a devastating impact on several islands in the Caribbean. In 2016 Hurricane Matthew, as a category 4 hurricane, made landfall in the southern peninsula of Haiti affecting about 1 million people with hurricane force winds, heavy rainfall and storm surge. About 900 people lost their lives and 1.4 million people were displaced.

In 2017 Hurricane Irma, as a major hurricane, impacted the islands of Barbuda, St Maarten, Anguilla, Turks and Caicos Islands and northern parts of Cuba. The damage was immense, about 80-90% of the homes was destroyed and about 40 deaths were attributed to this powerful hurricane. In this same month, another hurricane slammed parts of the Caribbean with devastating impact. Hurricane Maria, as a category 5 hurricane, devastated the islands of Dominica, U.S. Virgin Islands and Puerto Rico. The destruction due to this hurricane was enormous, about 2500 fatalities were registered and 80-90% of the buildings was destroyed. The total damage was estimated around US\$16 billion.

The islands of Curacao, Aruba and Bonaire are not outside the hurricane belt, as many consider. These islands are on the southern fringes of the hurricane belt. On the average, once every four years a tropical cyclone passes just to the north of the islands, without



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causing damaging winds, flooding or sea surges. In 1877, however, when a hurricane passed with its center just south of Curaçao, an estimated structural damage of US\$ 2 million (US\$ 45.5 million in today's economy) was reported, mainly at the coastal section of Willemstad.

A nunnery was completely washed away, many ships were lost and at least 70 persons drowned. In 1954, major Hurricane Hazel caused a damage of an estimated US\$ 350,000.00, resulting mainly from flash floods (48 hours Curaçao approx. 125 mm). Tropical Storm Joan, which passed just south of the islands on October 16, 1988, caused an estimated structural damage of approximately US\$1.5 million, mainly by blown off roofs and by rough seas pounding exposed harbor and beach facilities. Excessive rains in the aftermath of Joan additionally caused widespread flooding over the islands during several days.

Extremely dangerous Hurricane Ivan in 2004 became a serious threat for the ABC Islands. Its eye passed during the late evening of September 8 and the early morning of September 9, at approximately 130 km north of these islands. Although the destructive winds failed to impact the ABC Islands, the swells it generated were large enough to batter several constructions on its coasts. The greatest damage however was caused in Aruba during the early morning of September 10.

A developing spiral band of the hurricane caused very heavy rain over this island which

resulted in significant flooding in several locations and material damage at a cost of at least two million florins. Tropical Storm Omar in 2008 caused coastal flooding and damage to beach facilities on all three islands and Tropical Storm Tomás in 2010 caused significant damage and two deaths due to severe flash floods (350 mm in five hours). Tomás accounted for two fatalities and an estimated damage of US\$115 million in Curaçao.

Besides the effects of tropical cyclones being severe wind, heavy rainfall, storm surge and rough seas, Curaçao also had to deal with severe weather, flash floods, coastal inundation, prolonged droughts and heat waves outside the hurricane season. In addition, Curaçao also must prepare for the devastating impact of a tsunami. In this respect Curaçao is part of the IOC coordination group for tsunamis.

The risks due to climate change for Curaçao are expected to increase during the upcoming decades.

Based on the assessment reports of the IPCC (Intergovernmental Panel for Climate Change) it is possible to simulate the future climate (year 2100) using different emission scenarios of greenhouse gases. The effects of climate change on small islands are considerably larger than its main land counterparts, since islands are more vulnerable and cannot easily adapt to these changes.

The changes related to temperature will have



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unfavorable effects on human health, agriculture and air quality, due to the possible increase in vector-borne and water-borne diseases, the increased stress on the energy sector, and its resulting effects on air quality and increased aeroallergens (especially stressful for asthmatic patients). Resulting changes with respect to precipitation events will cause a decrease in the underground water reservoirs. Furthermore, extreme precipitation events can cause flooding in populated areas and many inconveniences.

The increase in mean sea level and the acidification of the sea will cause great stress on the underwater ecosystems, like corals, and increase the risk of storm surge affecting a larger part of populated coastal areas during the passage of a tropical cyclone. Moreover, it can cause salinization of the freshwater reservoirs, due to the infiltration of sea water in the coastal areas. The number of major tropical cyclones (category 3, 4 and 5) will likely increase due to climate change in the 21st century.

Furthermore, rainfall associated with these tropical cyclones will likely increase due to an increase in atmospheric moisture. For a 2° C global warming scenario, climate models project an increase on the order of 10-15% for rainfall rates within the tropical cyclone.

These include mainly economic losses due to endangered coastal settlements that will affect both the population and tourism (houses, apartments and hotels). The infrastructure of

a significant part of the islands will also be increasingly vulnerable to the rising sea level and the risk of flash floods and coastal inundation, resulting in severely damaged roads and government buildings. All of this will obviously lead to the requirement of large investments to guarantee sustained development in the near and distant future. A good coordination and collaboration among the government agencies, private companies and the NGOs therefore is essential and continual improvement of it is a must, in order to prevent unnecessary deaths and severe interruption of the economy.

Besides the expected losses of biodiversity and increased risks of natural hazards due to the impact of climate change that pose a real challenge for Curaçao, there are also some significant opportunities for Curaçao. Curaçao is well known for its natural resources like a steady wind regime, sunny weather and steep shorelines. Making use of these opportunities, Curaçao can further develop the renewable energy sector based on these natural resources.

Since the distances on the island are relatively short, Curaçao can promote the use of electric cars, scooters and bicycles as an alternative mean of transportation. Deep ocean water temperature can be used to cool buildings and develop a high-tech seawater industry.

With the establishment of a high-tech indus-



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try, Curaçao can function as a test-tube for international companies where our experts will build the required capacity to perform as international experts in the field of renewable energy and innovative technology. This industry will create new jobs for Curaçao and revenue for the national companies as an international technical consultant. Furthermore, as Curaçao will focus on the adaptive strategies in the areas of coastal zone management, water management, zoning policies to reduce the impact of climate change, excellent cooperation and collaboration will be built among the government agencies, private sector, academia and NGOs. Curaçao will be able to develop a center of excellence regarding mitigation and adaptation that can promote and be an exemplary SIDS of the United Nations.

Project proposal for UNESCO

Every two years UNESCO's Participation Programme provides a means of supporting national, sub regional or regional activities of Member and Associate Member States that are in line with the Organization's regular programme priorities. In 2018 the Curaçao National Commission for UNESCO called on NGOs and GOs to submit projects to the National Commission for submission to UNESCO H.Q in Paris. The project submitted by the Meteorological Department "Curaçao Climate Change Policy Assessment" was approved and received seed funding from the organization to execute the project during 2018 and 2019.

The overall objective of the UNESCO project is to enhance the resilience of Curaçao for the adverse impacts of natural hazards and the losses of biodiversity due to climate change by further strengthening the collaboration between the government agencies, the private sector and the NGOs to develop guide lines for the development of the national strategic adaptation plan. This project can be allocated under the national SDG Program, WMO Disaster Risk Reduction program and the UNESCO SDG Program on the mapping of IOC's contribution to the implementation of the 2030 agenda.



Above mentioned project focused on the enhancement of the capability to identify risks related to flash flooding and coastal inundation, integral water management, vector-borne diseases, heat waves, coastal zone management, and food security and build further on the capacity of national experts.

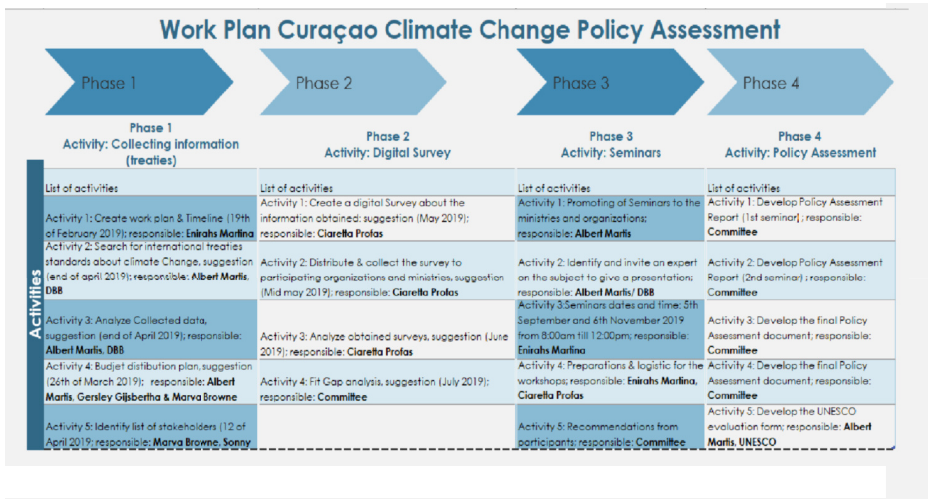
The beneficiaries of the activity and the nature of participation in the project were:

- Policymakers of the government agencies
- Educators, journalists
- Developers, Companies
- NGO
- University and secondary schools
- General public

Activities to be realized under the program were: studies, seminars, research, professional technical training, publications, innovative methods, management, etc. Workshops were held to present an approach on how to develop a guideline for the adaptation plan. This will be based on the mapping of both IOC's contribution to the implementation of the 2030 agenda and the SDGs, and contributions of the WMO Community. This is the start process and a follow-up will be done based on the outcome of the seminars with the stakeholders and specifically focus on government participation.

Expected outcomes

Fit gap analysis about the stakeholder's involvement in Climate Change resilience in a document. Guidelines for a sustainable development of a strategic plan for adaptation.





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	Phase 1 Outcome: Collecting data treaties	Phase 2 Outcome: Digital Survey	Phase 3 Outcome: Seminars	Phase 4 Outcome: Policy Assessment
Outcomes	List of Outcomes	List of Outcomes	List of Outcomes	List of Outcomes
	Outcome 1: Work plan document for approval	Outcome 1: Digital Survey & approved date: 23th of May 2019	Outcome 1: Where, how and when to promote (email)	Outcome 1: Results 1st seminar: final deliver date: 8th of October 2019
	Outcome 2: Treaties of Agenda 2030, Scardil Framework, Paris agreements (UNFCCC), SIDS action plan, Samoa Framework	Outcome 2: Distribute survey to participants approved deliver date: 24th of June - 19th of July 2019	Outcome 2: Albert will elaborate on the topics	Outcome 2: Results 2nd seminar: final deliver date: 15th of November 2019
	Outcome 3: Establish universal standards	Outcome 3: Document with analyzed surveys of participants/ final deliver date: Aug 2, 2019	Outcome 3: Seminars dates and time: 5th of September and 6th of November 2019 from 8:00am till 12:00pm	Outcome 3: Curaçao Climate Change Policy Assessment Report: Final deliver date: 27th of December 2019
	Outcome 4: Overview Budget distribution	Outcome 4: Document Fit Gap analysis date: Aug 2019	Outcome 4: Place: Auditorium UoC, materials: food & beverage, time, set-up, agenda	Outcome 4: Policy Assessment Report (design, print and distribute): Final deliver date: 30th of December 2020
	Outcome 5: List stakeholders		Outcome 5: Recommendations from participants	Outcome 5: Financial Report & Evaluation Report: Final deliver date: 31th of December 2019

Survey

Introduction

UNESCO Curaçao and Climate Change Committee Curaçao (CCCC) conducted a survey regarding Climate Change Policy Assessment between June 21st and August 26th, 2019 on Curaçao in order to assess organizational capacity, gaps and needs, and current efforts concerning climate change policies.

The CCCC is made up of key stakeholders, including representatives of ministries, NGOs, and National UNESCO Secretariat. The Committee is tasked with collecting and integrating information on climate change across sectors. The survey was conducted as part of an effort led by the Meteorological Department and Policy Department of the Ministry of VVRP jointly with the Curaçao National Commission for UNESCO to understand the status of climate change policy on Curaçao. The survey intended to assess what information on climate change respondents had ac-

cess to, if they had begun planning for adaptation and, if so, what obstacles they had encountered on the organizational, technical and financial level.

The results will be used to inform the Council of Ministers, the public and all other stakeholders how to assist the government of Curaçao in their preparations to tackle climate change impacts and to initiate the process to draft Climate Change Policy for Curaçao and an Action Plan to execute the policy.

Methodology

The study adopted a mix of quantitative and qualitative methods and tools to obtain a full understanding in which phase of policy each organization currently are. The CCCC drafted the survey and recruited 76 participants throughout emails, social networking sites, and mailing lists. The survey received 28 responses (a 37 percent response rate) from the various sectors listed in Table 1. The survey instrument consisted of 15 questions and was



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designed to assess organizational policies aiming at reducing or adapting to climate change impacts.

Sectors	Number of Responses
Public Sector	12
Private Sector	4
Nongovernmental	
Organizational Representatives	5
Others	6
Total	27
Complete survey	23
Incomplete survey	4
Total	27

*Table 1. Survey respondents

Results and responses

Several survey questions assessed respondents' understanding and awareness of climate change impacts. These questions focused on their knowledge of local climate change related pressures, the awareness of any organizational plans that have been in place to reduce the effects of climate change, the awareness of any plans aimed at adapting to the effects of climate change and the several stages in which an organization is involved in the process to formulate and implement a climate change strategy and policy within their organization.

The survey has been grouped according to the following topics:

Part I:

Assessing progress based on the building blocks of the process to formulate and implement your organizational plan.

Part II:

Support for the formulation and implementation of your organizational plan.

A. Support accessed and received (financial and technical)

B. Support provided (financial and technical)

Part III:

Monitoring, evaluation and reporting related to the process to formulate and implement your organizational plan.

Part IV:

Cross cutting issues.

Part I:

Assessing progress based on the building blocks of the process to formulate and implement your organizational plan.

Climate change related pressures that would affect the role of your organization.

Respondents were asked how climate change pressures would affect conditions on Curaçao. Respondents listed surface flooding as their greatest pressure regarding climate change, followed by changes to rainfall patterns as table 2 shows.

Other respondents elaborated on the following aspects:



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My department is the link between the Curaçao government and international organizations, and it is involved in the treaty negotiation and signing process. So, all the above-mentioned issues would indirectly put pressure on my department my organization is about good governance, so all the above on the long term is applicable our environmental organization is committed to all mentioned issues. Addressing the local people deserves much more attention.

Awareness of organizational plans that have been in place to reduce the effects of climate change.

Overall, 38% of the respondents reported being not aware of any organizational plans to deal with climate change (table 3). The respondents confirm that recycling, using renewable energy sources, reforestation, sustainable business practices and increased access to sustainable vehicles are implemented as organizational plans to reduce the effects of climate change.

Climate Change pressures	Responses
Surface flooding	63% 15
Changes to rainfall patterns	58% 14
Coastal erosion	50% 12
Changes in temperature	50% 11
Changes in ocean temperature	46% 11
More frequent extreme weather	46% 10
Drought	42% 10
Increased pollution in the water and air	42% 10
Water Management	42% 9
Ocean current change	38% 9
Economic decline	38% 9
Decreased opportunity for work	38% 8
Increased costs of living	33% 7
Food Security	29% 5
Changes to freshwater quality	21% 5
Decreased access to freshwater	21% 5
Adverse impact on human health	21% 4
Changes to ecosystem health	17% 3
Decreased access to food gathering sites	13% 4
Others (specify)	4
Total Respondents:	24

Organizational plans that are aimed at reducing climate change impacts

Responses	
Recycling	42% 10
No, I'm not aware of any plans	38% 9
Using renewable energy sources e.g. solar	29% 7
Reforestation (restocking of the endemic flora that have been depleted, usually through reforestation)	21% 5
Sustainable business practice e.g. eco-buildings	21% 5
Increased access to sustainable vehicles e.g. electric cars	17% 4
Reducing energy demand	13% 3
Diverting from fossil fuel	13% 3
Changes to farming practices	13% 3
Increased public transport	13% 3
Yes, the following plans on the specific topics are in place	8% 2
Afforestation (establishment of a stand of trees in an area where there was no endemic flora before)	0% 0

*Table 2: Overview of respondent's perception of climate change pressures that may affect the role of their organization



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Others (specify) - Risicoprofiel Curaçao 2017-2022 van Directie Risicobeheersing en Rampenbeleid	-	-
Total Respondents:		24

*Table 3: Overview of respondent's awareness of the type of organizational plans that have been in place to reduce the effects of climate change.

The awareness of any plans aimed at adapting to the effects of climate change.

The respondents were asked if there was anything being done by their organization aimed at adapting to the effects of climate change. More than half (54%) of the respondents answered that disaster risk management is priority area that should be aimed at when adapting to climate change impacts (table 4). Flood mitigation, increased forestation, water storage developments, coastal infrastructure and water use restrictions seem to be adaptation measures to be implemented according to the respondents.

Organizational plans that are aimed at adapting to climate change impacts	Responses
Disaster risk management	54% 13
No, I'm not aware of any department implementing such plans	38% 9
Flood mitigation tools	17% 4
Water storage developments	13% 3
Increased forestation	13% 3

Yes, the following plans on the specific topics are aimed at adapting to climate change effects:	8% 2
Coastal infrastructure e.g. seawalls, storm surge barriers,	8% 2
Coastal barriers	
Water use restrictions	8% 2

Insurance adaptation	0% 0
Climate change financing	0% 0
Others (specify) -	
- Risicoprofiel Curaçao 2017-2022 van Directie Risicobeheersing en Rampenbeleid	
- Coastal infrastructure: mangroves and other nature-based infrastructure	- -
Total Respondents:	24

*Table 4: Overview of the awareness of any plans aimed at adapting to the effects of climate change.

The process to formulate and implement a climate change strategy and policy within each organization.

According to the results of the respondents (table 5), their organization is currently in the early stages of laying the groundwork and addressing gaps with the climate change policy and preparatory elements are being implemented. 31% of the respondents are at these stages of climate change policy-making process:

- Initiate and launch the process
- Formulate, and issue policies, regulations, legislations and mandate for the process
- Consult and engage stakeholders
- Undertake activities on integrating adaptation into national and subnational development planning
- Communicate information of treaties
- Less than 13 % are currently at the reporting, monitoring and review stages.



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The process to formulate and implement a climate change strategy and policy within each organization

	Responses	
Element A: Laying the groundwork and addressing gaps	31%	5
Initiate and launch the process	31%	5
Formulate and issue policies, regulations, legislation and mandate for the process	31%	5
Consult and engage stakeholders	31%	5
Undertake activities on integrating adaptation into national and subnational development planning	31%	5
Communicate information of treaties	31%	5
Define institutional arrangements, coordination mechanisms (governance structure)	25%	4
Assess gaps and needs	25%	4
Synthesize available information, take stock of relevant activities (science and knowledge)	25%	4
Develop roadmap for the process	25%	4
Address capacity gaps and needs (capacity development)	25%	4
Element C: Implementation strategies	25%	4
Monitor and periodically review the process	25%	4
Update your plan as part of national planning	25%	4
Characterize the development context and identify adaptation–development themes	19%	3
Element B: Preparatory elements	19%	3
Identify adaptation options to address key vulnerabilities	19%	3
Prioritize climate change adaptation in aspects of national planning	19%	3
Element D: Reporting, monitoring and review	19%	3
Report on progress, effectiveness and gaps	19%	3
Complete roadmap	13%	2
Analyze past climate and climate change scenarios (science and knowledge)	13%	2
Comprehensively assess climate vulnerability	13%	2
Appraise, prioritize and rank adaptation options	13%	2
Design coherent implementation strategies, including synergy	13%	2
Implement and manage actions through policies, programmes, projects and other activities	13%	2
Design and apply a monitoring and evaluation framework or system	13%	2
Total Respondents:		16

*Table 5: Overview of the several stages in which an organization is involved in the process to formulate and implement a climate change strategy and policy within the organization.



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Part II:

Support for the formulation and implementation of your organizational plan.

maining respondents (86%) are not at either stage.

Support accessed and received (financial and technical).

Donor financial sources (29%), Bilateral Assistance (5%) and Special climate change fund (5%) are financial sources, which are used by the several organizations the responses of the respondents. One respondent mentioned that UNESCO provides funding for these kinds of programmes. The remaining respondents are not planning to access or do not have access to funding sources.

Access to financial support	Responses
None	67% 14
Domestic financial sources	29% 6
Bilateral assistance	5% 1
Special Climate Change Fund (SCCF)	5% 1
Global Environment Facility (GEF)	0% 0
All the above	0% 0
Other Specify – UNESCO fund/ NA	- 2
Total Respondents:	- 21

**Table 6: Overview of the funding source that each organization have already accessed or are in the process to access for their organizational plan*

Support provided (financial and technical)

The respondents were asked at which stage of accessing funds they are at. About 5% are at the stage to submit a financial request and 5% are ready to submit a proposal. The re-

Provided financial support	Responses
None	86% 18
Submission of readiness request by your organization	5% 1
Submission of readiness proposal by your organization	5% 1
Grant agreement sent to your organization	0% 0
Other (Specify) N/A	- 1
Total Respondents:	21

**Table 7: Overview of the funding source that each organization have already been provided or are in process of receiving*

Challenges in accessing financial support for the process to formulate and implement for your plan and the type of challenges.

Majority (53%) of the respondents answered that they do not have challenges in accessing funds. The respondents (47%) that did experience challenges listed the following reasons presented in the table 8.

Challenges in accessing financial support Responses

Yes, please elaborate	47% 8
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The financial situation of the Government. We have tried to access funds within the government for different projects for data collection, but there are no funds available due to the financial situation of the government right now.



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To comply with international Climate Change treaties, we need to address a backlog in affiliation with such treaties. Human and financial capacities are scarce. Plus: The risk profile produced by DRR is completed, but various ministries need to address the mitigation of the specific risks and fund those.

Curacao is considered as a developed country (Dutch Kingdom)

Lack of professional capacity

Not on time with proposal of funding support

Economic situation of small island with limited resources

The current budget restrictions and foreseeable deterioration of the government finances

No, please elaborate	53%	9
Do not know/NA/ No/No/No		
Not yet, because there were any movement in this direction		
Question is not clear to me		
Organization is not active on any plans as far as I know		
We must formulate plans first		

**Table 8: Overview of the challenges in accessing financial support*

Challenges successfully in utilizing the funds that obtained funding for their organization.

Majority (90%) of the respondents answered that they do not have challenges in using the funds and one respondent mentioned it can be challenging due to reporting issues.

Challenges in accessing financial support Responses

Reporting issues

NO/NA- 10X

**Table 8: Overview of the challenges in utilizing funds*

Technical support for the formulation of your organizational plan.

The majority (89 %) of the respondents answered that they do not receive technical support for their organization plan. A respondent mentioned that his/her organization is receiving bilateral/development support as technical assistance.

Technical support	Responses
Yes, our organization is receiving the following technical support:	0% 0
NAP global support programmes (i.e. UNDP-UNEP NAP GSP)	0% 0
NAP global support networks (i.e. NAP Global Network)	0% 0
Bilateral/development agencies, please specify	5% 1
No	89%
	17
Other (Specify) – WMO / UNESCO	6%
	7
Total Respondents:	19
-	

**Table 9: Overview of the type of technical support*



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Challenges in accessing technical support for the process to formulate and implement your organizational plan.

Respondents were asked if their organization experiences challenges in accessing technical support in order to formulate and implement their organizational plan. About 29% of the respondents reported to have challenges and 71% didn't, and the following reasons were stated:

Challenges in accessing technical support

	Responses
Yes, please elaborate	29% 5

We need ministries aligned on priorities if we want to join and comply with International treaties

Financial means to employ professionals

Economic situation of small island with limited resources.

Yes

We are understaffed

Not on time with proposal of funding support

Economic situation of small island with limited resources

The current budget restrictions and foreseeable deterioration of the government finances

No, please elaborate	71% 12
----------------------	--------

The directorate for Risk & Disaster Management coordinates the accessing of technical and financial support not yet, because there were any movement in this direction

We did not need technical support. The commission consists of technical experts

Does not have the information

Not yet, because there were any movement in this direction

N/a AT THIS MOMENT

They will send their expert to develop the plans

Not applicable (6x)

Not actively looking for support or making plans

**Table 10: Overview of the challenges in accessing technical support*

The policy areas needing of technical support for each organization needs.

The respondents were given a list of policy areas and other factors associated with climate change and asked to rate the importance of each to their own work concerning needing technical support for their own organizational needs (table 11). They deemed most of these factors extremely important and prioritized the development of properly managed data and information systems, urgent need for capacity-building, ecosystem impacts, and the shift of the assessment of climate vulnerabilities and risk to the identification of effective adaptation solutions and actions.



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The policy areas needing of technical support for each organization needs	Responses	
The development of properly managed data and information systems, which would serve as the basis for science-based planning and decision-making	56%	10
The urgent need for capacity-building in relation to the process to formulate and implement your plan, not only for the climate change focal points but also for other government agencies that will be part of the process	50%	9
How to move from the assessment of climate vulnerabilities and risk to the identification of effective adaptation solutions and actions	50%	9
How to communicate the process to formulate and implement your plan to policymakers and other stakeholders to create buy-in and political support, and ensure adaptation is prioritized in national planning	44%	8
How to create appropriate legislation to address climate change (including adaptation), especially given limited financial resources;	44%	8
Better coordination and coherence of support and other aspects of the process to formulate and implement your plan at key levels	39%	7
How to apply different vulnerability and risk assessments to different sectors and systems, considering important aspects of a country, and aggregate the results so that they can inform good planning at the organizational level	39%	7
The need for more outreach materials for use by relevant stakeholders in raising awareness and creating buy-in for the process to formulate and implement your plan at all levels	28%	5
How to take stock of information already captured in existing monitoring and evaluation systems in different sectors, and assess the suitability of existing frameworks to monitor progress under the process to formulate and implement your plan	28%	5
How to enhance access to information on available financing for all aspects of adaptation readiness, formulation of plans, implementation of adaptation measures and requirements for access	28%	5
How to practically link the process to formulate and implement your plan with low-carbon development strategies, the SDG, the GCF and other relevant processes.	28%	5
How to make various international and regional programmes work in support of national efforts on adaptation under your plan umbrella to avoid conflicting messages and duplication of effort	22%	4
How to access and use the best available science and knowledge of climate scenarios such as that based on the latest IPCC assessments and guidance, and in such a way as to translate the less than 2°C global temperature goal to regional changes suitable for application at the country level	22%	4
How to develop robust programmes, policies and projects that lead to positive outcomes in reducing vulnerability and the integration of climate change in national development planning	22%	4



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How to develop a common understanding of the process to formulate and implement your plan among all stakeholders and actors in order to facilitate an effective and coherent approach to adaptation planning and implementation, using decisions of the Conference of the Parties on NAPs as a common denominator 17% 3

Total Respondents: 18

**Table 11: Overview of the policy areas needing of technical support*

Part III:

Monitoring, evaluation and reporting related to the process to formulate and implement your organizational plan.

Specific metrics in monitoring each organizational process.

The following table provides an overview of the most used monitoring metrics by the respondents.

Responses:

Roadmap

A calendar with important meetings or events and will ask relevant agencies for input or forward invitations when necessary

DRR meets with ministries, but no specific metrics or monitoring tool is in place.

We use Quality Management System

We have meetings every month to talk about our goals and the methods to obtain these goals

There is not monitoring plan yet

We have just started and will use simple progress reports

**Table 12: Overview of monitoring metrics*

Part IV:

Cross cutting issues.

The institutional arrangements for stakeholder's engagement in your organization.

The following table provides an overview of the institutional arrangements for stakeholder's engagement. Inter-ministerial working groups focus groups and technical platforms seem to be the most used institutional arrangements.

Institutional arrangements	Responses
Inter-ministerial working group	56% 9
Focus groups	25% 4
Technical Platform	25% 4
Steering or Monitoring Committee	19% 3
Public -Private Partnerships	19% 3
Multi – stakeholder networks	19% 3
Open dialogue with interest groups	13% 2
Task Force	13% 2
National Council	6% 1
Forum	6% 1
Tiger teams	0% 0
Total Respondents:	-16

**Table 13: Overview of institutional arrangements*



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Key factors for adaptive capacities that are challenging for Curaçao.

Respondents were asked to choose potential hurdles to adaptation and a vast majority indicated that economic resources and policy can be deemed as challenging.

Adaptive capacities	Responses
Economic resources	82% 14
Policy	76% 13
Institutions and networks	53% 9
Legal framework	53% 9
Human Capital	47% 8
Education	47% 8
Information skills and management	41% 7
Technology	35% 6
Social Equity	35% 6
Experts	35% 6
Knowledge	35% 6
Infrastructure	29% 6
Other (specify): Good Governance	- 1
Total Respondents	-17

**Table 14: Overview of adaptive capacities*

Comments, questions, or suggestions from respondents about this program and the survey.

Responses:

If the Government has ratified the Paris Agreement, it must become part of our Laws and regulatory infrastructure, implemented country wide and enforced;

The world is behind par, Curaçao is behind the world

I think the government should do more to help the climate issue and spread awareness

The need to communicate knowledge and proposals to reduce fossil fuels use through mass media, made possible by buying publication space in written press and radio/television airtime.

I found the questions extremely hard to understand and hope I understood them correctly. There is too much vague lingo in this questionnaire that makes it hard to understand what information the surveyors are looking for.

Looking forward to the results of the assessment

**Table 15: Overview of comments, questions, or suggestions*



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Conclusions

The findings of this survey offer direction and support to Curaçao Climate Change Policy Assessment. This assessment illustrates that the respondents need most of all more information, guidance on implementing adaptation strategies, and assistance in overcoming various policy hurdles. Also, they are undertaking activities to consult and engage stakeholders on climate change related issues and impacts.

However, most of the respondents do not have as much detailed information about local impacts as they would like. Possible reasons for this deficiency include the hurdles of the development of properly managed data and information systems, which would serve as the basis for science-based planning and decision-making, capacity building and assessment of climate change vulnerabilities. Most of the respondents believe that planning for climate change should be initiated by a government entity or combination of government entities, with a focus on adaptation.

The survey results further show that respondents faced most often a lack of economic resources, policy tools and institutional capacity and remain caught in the “laying the groundwork and understanding gaps” phase, rather than moving on to planning and implementation. This suggests that devoting resources to gathering locally specific climate information would serve local decision makers as well the

whole public. While most respondents would like to develop plans for adapting to climate change, the hurdles they identify show why they are not yet doing so. One potential way to address these hurdles is by providing guidance in the updating of established planning mechanisms; such updates are one motivator for climate adaptation planning that many respondents identified.

Moreover, it can be surmised that facing day to day challenges, a longer-term vision and approach such as a climate policy consequently suffers attention and means by default, especially within a context of economic (short term) challenges and a priori economic prioritization.

Curaçao already has many different planning mechanisms in place that can incorporate climate change adaptation information, including roadmaps; risk profiles quality management systems and SDG's Roadmap, which are administered by several governmental agencies. Any financial or technical guidance provided to local communities must address not just how to move through the adaptation phase, but how to overcome potential hurdles to adaptation.

Curaçao has a limited financial and organizational capacity to accomplish such a task. Stronger coordination at the governmental level jointly with the private sector and NGOs is necessary to guide this country through the climate adaptation process. This provides an opportunity to policymakers to act in order to create appropriate communications on cli-



mate change, revise, and implement nationally appropriate policies and strategies on climate change adaptation.

Climate Change Committee Curaçao seeks guidance and knowledge on how to move forward in the adaptation process; more specifically, how to move from understanding the results of this policy assessment survey to finding adaptation solutions and implementing them. Climate Change policies should be crafted to suit local areas and communities and be relevant to them. They must be tailored to nationally specific contexts, particularly on Curaçao to ensure active citizen engagement. Understanding the perceptions of climate change among residents in a highly vulnerable country is therefore critical to developing and implementing a Climate Change Policy and Action Plan.

Limitations of the survey

The survey represents a limited population from a limited area; this may have induced some bias in the study sample. Without neglecting that the climate change policy indicators used in this survey, these are a quick and cost-efficient way to get an overview on a country's level of climate change policies within each organization, but this tool also exhibits two limitations:

First, many of the indicators from the survey are rather generic, which highlights the need

to complement them with adequate indicators from national datasets.

Second, as the global databases from which the indicators are retrieved do not focus on resilience, not all the characteristics of a climate-resilient system are reflected adequately in the data sources. These limitations demonstrate that oversimplified conclusions solely based on the climate change policy indicators should be avoided. A closer look at climate change policy on national level can be provided by complementing already existing secondary data with primary data collected in Curaçao's context.

Seminars

As planned the results of the survey conducted were discussed by Curaçao National Commission for UNESCO and Climate Change Committee Curaçao (CCCC) in preparation of the Seminar. During the seminar held on September 6th, the results of the survey were presented to the stakeholders and discussed it in more depth. The objective of the seminar was to establish the priorities and develop recommendation for the further development of a mitigation and adaptation plan.

Results of the first seminar

Mitigation measures

Mitigation measures for climate change refer to measures taken to reduce or prevent emission of greenhouse gases. This can be achieved by using new technologies and renewable



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energies, making older equipment more energy efficient, or changing management practices or consumer behavior to reduce their greenhouse gases footprint. During the breakout session, the group that concentrated on climate change mitigation looked at how the greenhouse gases footprint of the island could be reduced, secondary spinoffs that would become available or made possible due to the implementation of these measures and what the priority in execution of these measures would be.

To have a better view of the task at hand, the group delved into the subject by analyzing the top 3 emitters and defined control measures for each to reduce their greenhouse gases footprint. The top 4 emitters for Curaçao are the refinery, water and electricity production, transportation and the landfill. Since the refinery is an intricate subject that would need substantial time to discuss, the group chose to take aboard the three other emitters and leave the discussions on the refinery for a future session.

Findings

Water and electricity

The island has a vast history of implementing renewable energy to produce electricity. The consensus within the group was that Curaçao should continue to focus its efforts on introducing renewables to the energy mix. Another measure that has given great results was the introduction of prepaid energy system (Paga-

tinu), which has increased the awareness of electricity use.

Other measures that could be introduced were linked to demand management on the level of individual households, but also on the level of the commercial and touristic sector. Furthermore, it was observed that communication and information on best practices and energy efficient choices is of utmost importance. It was suggested that the consumer protection organization (Fundashon pa Konsumido) could take the task of raising awareness on itself and periodically issue information to the users.

Since water production is another activity that requires vast quantities of electricity, it was also suggested to decrease water demand. This could be achieved by identifying other sources of water than the current source of water which is attained using the reverse osmosis technology. The government should provide incentives to the public to implement water saving techniques into their homes.

Transportation

Transportation presents a large and growing worldwide greenhouse gas (GHG) emission challenge. Curaçao is no exemption to this worldwide challenge, since the dependence on vehicles for transportation is high and the island is highly dependent on import of consumption goods. GHG mitigation strategies can be grouped into three categories, vehicle



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efficiency, low carbon fuels, and travel reduction.

The measures identified by the group were to stimulate the use of public transportation. This could be achieved by stopping the use of cars for one day in the week, improve the transportation infrastructure for public transport and using a system of public transportation consisting of local and large distance buses to reduce the travel time and comfort of the passenger. Furthermore, it was suggested to introduce a system based on the polluter pays for levying road tax.

This implies charging higher tariffs for older cars and cars fueled by petrol. The group also suggested the introduction of LPG-gas as a means of fuel instead of the conventional gas and petrol fuels.

Landfill

The island of Curaçao currently uses a landfill for the deposit of waste. The current landfill is reaching its capacity limit. The group suggested to introduce the conventional reduces, reuse and recycle paradigm to tackle the greenhouse gas challenge related to the landfill.

Waste separation should be introduced on the island and the system of a small deposit for recyclables could be introduced as a form of compensation, while higher taxes could be levied on products that cause pollution. They furthermore suggested exploring the possibilities for introducing waste-to-energy tech-

nologies to turn this challenge into a benefit.

Crosscutting issues

The group identified that it is of utmost importance to have a clear vision and outcomes defined. The government must set targets, develop strategies to reach these targets and continuously monitor the achievement of these targets. Furthermore, clear roles, responsibilities and accountability must be defined for the execution of these strategies.

The group stressed on the need to increase the awareness of the impact of climate change on our generation and future generations. The message should be to take care of what we currently have by making educated choices, to safeguard the availability of these resources for future generations. This could be achieved by using audio-visuals to simply explain climate change and teaching sustainable development at schools.

Adaptation measures

Adaptation is “the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects”. In terms of adaptation measures, at the national level, there are several actions proposed by participants that help reducing vulnerability to the consequences of climate change.



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During the breakout session the group focused on climate change adaptation with regards to green infrastructure, water management, built environment, overall dissemination of information, communication and consolidating already existing risk assessments.

Findings

Green infrastructure

Green Infrastructure “is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas¹.

Green Infrastructure is among the most widely applicable, economically viable and effective tools to combat the impacts of climate change and help people adapt to or mitigate the adverse effects of climate change. During the seminar, the group highlighted the need for greener infrastructure in neighborhoods of Curaçao and the incentive needed to create voluntary efforts in neighborhoods for maintenance of the green infrastructure. Furthermore, the group urged to create green areas to strengthen the biodiversity in ecosystems such as mangroves and coral reefs, which could pose as carbon sinks. Overall, the group agreed that this adaptation measure is deemed to be urgent, since the existing green infrastructure is diminishing at a rapid pace. Climate change adaptation related Green Infrastructure measures are an important instrument for achieving sustainable adaptation,

while creating multiple benefits and having the potential to save lives and save costs.

Water

Curaçao has proven to be no different from other countries in that freshwater is essential to human existence and a major requirement in agricultural and other commercial production systems. However, the ability of the island country to effectively manage the water sector differs from some other countries as it is constrained by its small size, isolation, fragility, natural vulnerability, and a limited human, financial and natural resource base². In this instance, the group suggested measures to respond to projected decreases in water resources, which include: creating incentives to encourage the use of waste water; selecting appropriate decentralized water storage tanks, and make these accessible for neighborhoods; identifying new infiltration methods, besides the current existing dams’ systems to enhance replenishment of groundwater in certain areas; updating national water policies, improving water resources management; creating decentralized wastewater purification plants for reuse for farming and in existing neighborhoods.

Building environment

The concentration of large housing neighborhoods (with associated economic and social activities) at or near the coast is a well-documented feature of small islands. On Curaçao,

¹ Green infrastructure and climate adaptation, EU - 2011

² Perspectives on water and climate change adaptation, SOPAC, 2009



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certain neighborhoods are located near coastal areas and in the Caribbean more than half of the population lives within 1.5 km of the shoreline. Such areas or neighborhoods are also occupied by a range of settlements, and on many small islands' government buildings and important facilities such as hospitals are traditionally frequently located close to the shore.

The group suggested possible measures to address impacts with regards to the built environment: to implement a new building decree with revised building codes; providing scientific and engineering services required to assess vulnerabilities and define priorities, then retrofitting existing buildings by making them climate proof and resilient; improving the planning and permitting processes to guide coastal zone activities, including regulatory adjustments, awareness raising and enforcement; producing design and construction guidelines and applying them in pilot investments for new housing projects.

Communication

Understanding the effects of climate change, and associated enhanced risk assessments, at the local and national levels is critical for adaptation, as is the capacity to select and apply appropriate communication methods and tools to prepare for adaptation. Furthermore, the participants at the seminar suggested following communication measures related to adaptation measures: the use and integration of traditional knowledge and the communication of science in ways that can be

understood; visualization of climate change impact through 3D maps/GIS/YouTube; consolidate risk assessments; user-friendly documentation of successful pilot schemes on adaptation assessment; disseminating information relating to the potential impacts of climate change, and the benefits and advantages of reducing vulnerabilities by means of stronger public education and outreach programmes.

Results of the second seminar

During the second seminar the participants elaborated on the following topics: suggested activities to achieve the vision, the national needs, the priorities and the expected results.

I. Suggested activities to achieve the vision:

- Reduce Carbon emissions and other GHGs
- Create infrastructure for distribution of grey water
- Increase use of solar energy
- Draft Climate change policy,
- Better and integrated water management
- Create a greener public transportation system
- Sea level rise – coastal areas i.e. inner-city
- Increased durability of the built environment



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- Paradigm change towards the impacts of climate change consciousness and awareness
- Preparedness on technical, behavioral aspects towards climate change

II. National needs:

- Aqualectra will be aiming at solar energy 5/y
- Aqualectra will be leading company in solar energy installation etc.
- Rainwater harvesting for agricultural use
- Wastewater management
- Improved current public transportation system to green goals
- Improved school transportation and bus system
- Reduce vulnerability – coastal areas
- Less dependent/ independent alternative energy infrastructure
- Coordinated, effective and sustainable information on climate change
- Funding, leadership and support

III Priorities:

- Smart solar panel culture
- Modernized reverse osmosis system
- Infrastructure for electric cars/ transportation
- Study on coastal protection / natural disasters – evacuation of vulnerable areas
- Green infrastructure (i.e. mangroves/natural terrace)
- Study on green buildings in the context of Curaçao

IV Expected results:

- Environmentally more conscious
- Less upward pressure on production costs of potable water
- More agriculture and food (less dependent on imported goods)
- Better replenishment of groundwater
- Green hub and infrastructure (public areas)
- Less dependent on fossil fuels
- Organizational structured network



Conclusions

As discussed in the project proposal of the participation program of the UNESCO, the increased risk of natural hazards and losses of biodiversity due to the likely impact of climate change will certainly affect the Small islands Development States relatively more than the mainland. The effects that were explored by the IPCC were generic and not so specific for the islands in the different regions. For example, in the Caribbean Area the activity of the hurricanes is a big challenge and in the Pacific Ocean the sea level rise is an imminent threat to the islands.

As the effects of climate change will impact almost all sectors of Curaçao, it was important to involve a broader community as from the start. Therefore, the main objective of this project was to examine the present capacity and knowledge of the different stakeholders in Curaçao related to the impact of climate



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change and the related plans. In the planning face of this project the related treaties and documents about climate change were collected. The latest IPCC assessment report and Paris Agreement were the most important documents to be used as point of departure. As already mentioned, the IPCC report deals with the effects of climate change, whereas the Paris Agreement deals mainly with the action plans for mitigation and adaptation. By executing the national action plans of the member states their vulnerability will be reduced while their resilience will be enhanced. Furthermore, based on the expertise of the NUC, potential stakeholders were identified to start up the project.

In the second phase a survey was prepared and was completed by 36% of the stakeholders after three months.

The main conclusions were that they needed more information regarding the possible impact of climate change on national level. Due to a lack of information about the impact of climate change it was not possible to develop proper data and information that will be used for a science-based planning and decision-making process. This also includes capacity development of the organizations. They also indicated that guidance on the implementation of the adaptation strategies and assistance in overcoming various policy hurdles were limiting factors. Lack of economic resources, institutional capacity and policy tools were the main reasons why several works in

this area remained in the identification phase. Moreover, there are many different planning mechanisms in the government agencies that deal with the different aspects of climate change, including roadmaps, risk profiles, SDGs and national development plans.

During the seminars the results of the survey were presented and discussed. As a result, a list of focus areas was created and taken into consideration concerning the general needs in Curaçao and the working capacity of the stakeholders. The priorities in the area of mitigation were water and electricity, transportation on land and landfill. In the area of adaptation, the priorities were green infrastructure, water management and the building environment. Both groups indicated the need for a strong awareness campaign. This cross-cutting issue was also one of the key results of the survey. Furthermore, the participants elaborated on different aspects of a strategic planning cycle. This involved the activities to achieve a common vision, mission, the strategic objectives and the expected results in the areas related to climate change in Curaçao. All these items were building blocks for a road map on climate change.

Since Curaçao has limited financial, institutional and human capacity to accomplish such crosscutting tasks, it is suggested to develop mechanisms that incorporate all the relevant stakeholders. Such a body will assess the effects and impacts of climate change for Curaçao, hold regular consultation among the



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stakeholders, and build consensus on related subjects. This mechanism will also assure the sustainability of the planning process of the stakeholders. This was indicated as a hurdle in the survey. This assessment and these scenarios will be used to design the national mitigation and adaptation plan by the government. The objective will be that all the different sectors of Curaçao will have a single climate change platform to discuss, elaborate and build national capacity and collaborate with both national and international organizations in a sustainable method. The goal will be to reduce vulnerability and enhance the resilience of Curaçao and assisting other Small Island Development States in their attempts.

Recommendation: Curaçao Climate Change Road Map

Introduction

The risks of natural hazards and losses of biodiversity due to climate change for Curaçao are expected to increase during the upcoming decades. These include mainly economic losses in coastal settlements that will affect both the population and tourism (houses, apartments and hotels). The infrastructure of a significant part of the island will also be increasingly vulnerable to the rising sea level and the risk of flash floods and coastal inundation, resulting in severely damaged roads and vital buildings.

All of this will obviously lead to stronger requirements of large investments to guarantee sustained development in the near and distant future. A good coordination and collaboration among the government agencies, private companies and the NGOs therefore is essential and the continual improvement of it, in order to prevent unnecessary deaths, severe interruption of the economy and loss of biodiversity. Therefore, it is essential to develop a road map regarding the way to address the impact of climate change for Curacao.

Objective Road Map

The overall objective of this Road Map is to develop a Strategic Plan and implementation plan that includes major steps to reduce the vulnerability and enhance the resilience of Curaçao for the adverse impacts of climate change. Furthermore, to further build the capacity of national experts and organizations in the fields related to climate change, in order to make its implementation sustainable at national level and enhance opportunities for our experts at international level. During the implementation of this Road Map, the collaboration between the government agencies, the private sector and the NGOs will be fortified and guiding principles for the development of the national mitigation and adaptation plans will be established. At international level, the scientific, evidence-based approach and consensus among the stakeholders on focus areas were successfully introduced as guiding principles.



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Therefore, considering the need for close collaboration at both national and international level in the areas of hydrology, climate and environment concerning climate change, a body called Curaçao Climate Change Network (CCCN) shall be established. Such a body will assess the effects and impacts of climate change in Curaçao, hold regular consultation meetings among the stakeholders, and build consensus on related subjects.

The Network shall comprise of:
Curaçao Climate Change Panel (hereafter called "the Panel")

The Board

Technical Committees

The Secretariat

There shall be a Chair and Vice-Chair of the Network who shall also be Chair and Vice-Chair of Panel and of the Board. The activities of the Network and the conduct of its affairs shall be decided by the Members of the Network

Membership

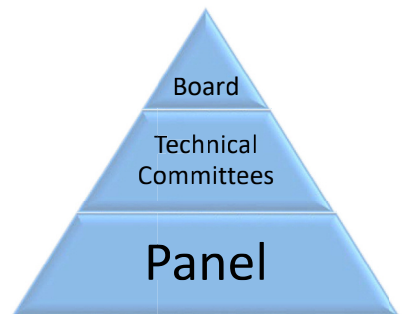
The following may become Members of the Network by the procedure set forth below:

- Agencies of the government
- Academia
- Non-Governmental organization
- Company in the private sector

1. Any organization represented at the Conference convened on 31 January 2020, as listed in Annex 1 which signs the present

report and ratifies it.

2. In order to apply for new membership, the organization will send its official request by written notification to the Secretariat. The letter will include (not limited to) the objectives of the agency, organization or company, the name of the director/head, his/her alternate, and where necessary, track record/credentials in the area of climate change. A code of conduct will be established. Directly after the opening of the Panel session, the new membership will be discussed and put for voting. Decisions shall be by a two-thirds majority of the votes cast for and against. If the new membership is approved, the organization will be able to speak and vote during the Panel session.
3. Observers and experts may participate during the Panel session without speaking and voting rights.





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Activities Panel

The Panel is the general assembly of delegates representing Members and as such is the supreme body of the Network. Each Member shall designate one of its delegates, as its principal delegate at the Panel.

Plenary Sessions of the Panel also determine the Panel work plan, and other business including its budget and outlines of reports.

The assessments reports will provide a scientific basis for the government and stakeholders at all levels to develop building blocks for climate related policies. To deliver this work, the CCCP holds annual meetings of representatives of members, convening as plenary sessions of the Panel or the technical committees, to elaborate, summarize, approve, adopt and accept reports.

Every two years the Panel will elect a Chair, three Vice Chairs and eight members of the Board. The three Vice-Chairs will be the chairs of the three Technical Committees. Normally each of the chairs should come from a different sector to cover the sectorial distribution.

Activities Board

The Board is the executive body of the Network and is responsible to the Panel for the coordination of the plans of the Network and for the utilization of its budgetary resources in accordance with the decisions of the Panel.

The Board meets regularly to provide guid-

ance to the Panel and supervision of technical committees on scientific and technical aspects of its work.

The Board consist of the Chair and the three Vice Chairs of the Panel, 11 elected members.

Activities Technical Committees

Committees consisting of technical experts may be established by the Panel to study and make recommendations to the Panel and the Board on any subject within the purpose of the Network. Members of the Network have the right to be represented on the technical committees.

The technical committees of the Network established by the Panel are the following:

1. Committee for impacts studies of climate change,
2. Committee on mitigation aspects
3. Committee on adaptation aspects

Each technical committee consists of the Vice-Chair of the Panel and at the maximum 20 technical experts.

Activities Secretariat

The planning process is as follows:

1. A strategic plan containing the vision (10 years), national needs, strategic objectives, expected results and priorities will be prepared and discussed with the stakeholders.
2. A work plan (2 years) will be developed to cover the activities, key performance indi-



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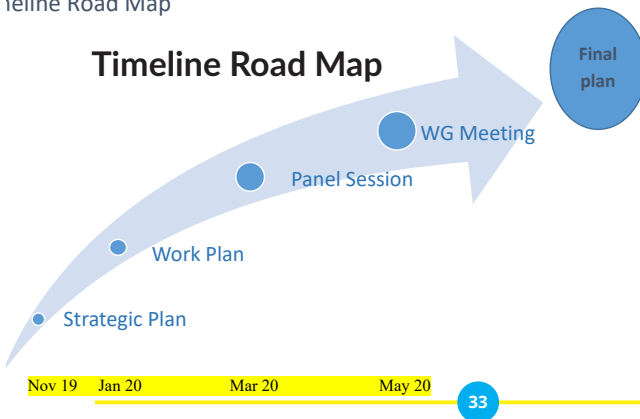


- cators and deliverables of each objective.
- To manage the several activities technical committees will focus on the impacts of climate change, mitigation and on adaptation aspects. Lectures will be given of studies and scientific research discussed during work sessions. The results of the presented papers will be then merged in one document, based on consensus and reviewed by a group of editors.
 - The working groups will present and discuss their findings during a panel session. The selected editors will review the enrichments of the panel session and the final draft of the document where after the members will adopt the document. The Board will prepare it for publication.



eline Road Map

Timeline Road Map



Acknowledgments

Much of the success of this study can be attributed to the excellent team of experts that contributed in the discussion and possible options to develop the consultation mechanism. The creation of this study was managed by a team consisting of Ciarretta Profas of the Ministry of Health and Environment, Marva Browne Secretary General of the Curaçao National Commission for UNESCO, Phillipson Rifaela and Enirahs Martina of the Curaçao National Commission Secretariat, and Pedzi Girigori de Flores Martinez, Albert Martis and Miriam Jonker of the Ministry of Traffic, Transportation and Urban Planning and Gersley Gijbertha of the Ministry of Economic Development. Important contribution was provided by the Climate Change Committee of the Curacao National Commission for UNESCO. In several occasions they give feedback on the work plan to further develop this study successfully. Several organizations devoted their time and participated actively during the

seminar held to further develop the ideas on how to set up the realistic goals and the path forward. This project was supported by funds received by UNESCO from the Participation Programme for the biennium of 2018-2019.



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Annex

List of Seminars Participants

<i>Curacao Climate Change Policy Assessment</i>				
Attendance list Seminar #3- January 31, 2020				
#	Emails	Name	Organization	Sign
1	albert.martis@meteo.cw	Albert Martis	Meteo	x
2	chris.jager@gobiernu.cw	Chris Jager	CBS	x
3	enirahsmartina@outlook.com	Enirahs Martina	Secretariat Unesco	x
4	marvabrowne@yahoo.com	Marva Browne	Natcom Unesco	x
5	miriam.jonker@gobiernu.cw	Miriam Jonker	VVRP	x
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