Application of Child Inclusive Caribbean Community Risk Information Tool (CCRIT) in Suriname

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CDEMA
CARIBBEAN DISASTER EMERGENCY MANAGEMENT AGENCY
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NCCR SURINAME
Nationaal Coördinatie Centrum Rampenbeheersing

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1. Acknowledgements

I wish to thank the various stakeholders and other persons who facilitated the completion of this exercise. The staff of Nationaal Coördinatie Centrum voor Rampenbeheersing (NCCR) Suriname, who aided in the collection of data, provided logistical support and general assistance during the missions, thereby providing invaluable support in completing this stage of implementation.

Special thanks are extended to Colonel Jerry Slijngaard for his leadership, dedication, and understanding; and Ms. Dulci Duurham for her valuable assistance and time.

Assistance in the provision of data was also given by the District Commissioners of the districts of Marowijne, Brokopondo and Sipaliwini; as well as district representatives and District Commissioners' staff.

Additionally, the advice and support from Ms. Donna Pierre and Mr. Ian Jones proved pivotal in completion of the project activities. Finally, special thanks are extended to Mr. Isaac Alfred, analyst and digital designer, who provided extensive assistance in the generation and analysis of data and various graphic and pictorial tools.

CONSULTANT: RIVER PROVIDENCE

Acronyms

CBO	Community-based Organisations
CCRIT	Caribbean Community Risk Information Tool
CDEMA	Caribbean Disaster Emergency Management Agency
CDEMA CU	Caribbean Disaster Emergency Management Agency Coordinating Unit
CDEMA PS	Caribbean Disaster Emergency Management Agency Participating States
CDM	Comprehensive Disaster Management
CWP	Country Work Plan
DM	Disaster Management
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EWS	Early Warning System
FBO	Faith-based Organisation
GIS	Geographical Information System
HS	Health Sector
IFRC	International Federation of the Red Cross & Red Crescent
ICT	Information Communication Technology
NCCR	National Coordination Centre of Disaster Management
NDC	National Disaster Coordinator
NDO	National Disaster Office
NGO	Non-Governmental Organisation
PS	Participating States
STM	Strategic Targeting Methodology
TOR	Terms of Reference
UNICEF	United Nations Children's Fund

2. Background

Taken from the Terms of Reference

UNICEF Suriname has received funding for Disaster Risk Reduction (DRR) actions as outlined through the Sendai framework and the Samoa Pathway to address the need for strengthening children's resilience to the impacts of climate change and to improve adaptive capacity to emergencies. For Suriname with 33% of its population under the age of 18 (SOWC 2012), systematic and inclusive child centered risk analysis through the introduction of identified tools as part of strategies for enhancing information management capacities and building foundations for risk informed programming, are essential.

The Caribbean Disaster Emergency Management Agency (CDEMA) in partnership with the International Federation of the Red Cross and Red Crescent Societies (IFRC) back in 2016 facilitated the implementation of what was originally referred to as the Strategic Targeting Methodology (STM) in Suriname. This risk assessment tool was part of an overall DIPECHO funded initiative called the Caribbean Communities Organized and Prepared for Emergencies (CCOPE). This initiative supported the Suriname DRM agency the National Coordination Centre of Disaster Management (NCCR) to strengthen and sustain national resilience through prioritized targeting of the most vulnerable communities. In efforts to promote and enhance resilience at the national level, it is vitally important to accurately measure the level of exposure faced by communities in light of disasters.

In 2016 an STM workshop was co-facilitated by CDEMA and IFRC with the NCCR along with the Red Cross Society and key Disaster Risk Management (DRM) stakeholders in Paramaribo to introduce the methodology. Following the introduction of the risk information methodology the toolkit was handed over to CDEMA and subsequent changes were made to it including the name. It is now being referred to as the Caribbean Community Risk Information Tool.

The NCCR, as the overall lead of implementing and managing the collecting and analysing of risk data collected through this methodology, has advanced the application of the toolkit in at least 60% of its districts. With four more districts to complete, the NCCR is desirous of completing the application to demonstrate the importance of evidence to making disaster risk reduction decisions.

UNICEF recognizes that while disaster risk poses a significant threat to a child's rights and their development, a holistic approach to support the capacities of children, communities and governments to deal with multiple shocks and stresses is required. UNICEF is therefore promoting risk informed programming which includes development of nationally led common risk assessments such as the CCRIT, which have specific scope to identify and address vulnerabilities and challenges children in Suriname face. For the NCCR as the Government of Suriname's DRM agency, such a child inclusive focus being infused within the CCRIT will further enhance national commitments made under the Convention on the Rights of the Child.

3. Introduction

The Caribbean Community Risk Information Tool (CCRIT) allows countries the choice to assess risk at various levels, whether nationally, sub-nationally or within communities. This is done by capturing data related to exposure to hazards, the level of vulnerability of populations and the capacity available to mitigate and respond to events. These components are used in the generation of an overall risk score, which allows for easy comparison of communities and districts. The objective of this tool is to provide risk information for decision making that is objective. Disaster risk reduction capacity can be improved by in communities as planning can be tailored to the specific needs in a community or district. It is expected that such information will influence decision-making related to enhancing prepared and disaster risk reduction initiatives and activities.

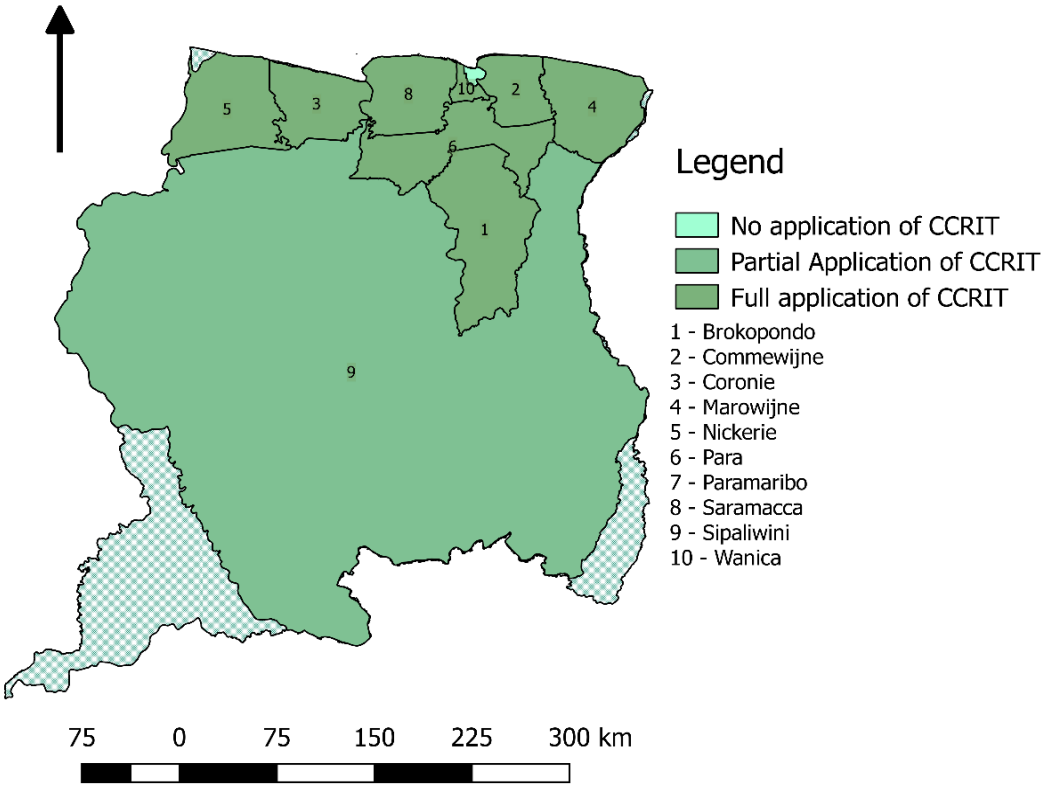

Figure 1 Highlighting the districts to which CCRIT has been applied

With the completion of this stage of implementation of the Child-Inclusive CCRIT methodology in Suriname, nine of ten districts have been inputted into the risk information platform. This brings Suriname one step closer to becoming the first country within the CDEMA Participating State (PS) to complete the application of this tool. Continued

application of this tool in Suriname has yielded, and will continue to yield, recommendations and lessons that will improve the Child-Inclusive CCRIT methodology and the application process.

This report aims to detail the efforts made in completing each result as delineated by the TOR. These results are as follows:

- Inception meeting with the NCCR and the National Resilience Steering Committee to propose actions to verifying districts done previously and approach to rolling out in another three districts
- Verification and validation session with NCCR, Steering Committee and District representatives
- Complete at least one Risk Profile to be used in other districts
- Document or update existing documentation on best practices/lessons learnt
- Hand over session with the NCCR to ensure transition of key documents and information on processes and key partners to be involved

4. Key Results

Achievements of the consultancy weighed against objects stated in the TOR

4.1 Inception meeting with the NCCR and the National Resilience Steering Committee to proposed actions to verifying districts done previously and approach to rolling out in another three districts

The inception meeting was held on the 7th May via Skype conferencing, to coordinate the verification of previous applications of the CCRIT and the application of the tool in Brokopondo, Marowijne and Sipaliwini. First, the findings of the CCRIT tool application in Suriname were detailed, within the scope of the consultancy. Second, the approach to rolling out the methodology in Brokopondo, Marowijne and Sipaliwini was discussed, as well as the plan to finalise the verification of data collected in the districts of Para, Wanica and Nickerie. Additionally, logistical matters were addressed to facilitate the data collection missions. Finally, an inception report was submitted on the 27th April, 2018 to capture the outcomes of this meeting.

The Child-Inclusive CCRIT methodology was rolled out in Brokopondo, Marowijne and four ressorts of Sipaliwini. Due to limitations with time and availability of district personnel NCCR was unable to collect data for the other two districts of Sipaliwini. Therefore, this has resulted in nine of the ten districts having this methodology applied to their ressorts. The district dashboard speedometers for these three districts were thus propagated within the tool, and the data utilised in the updating of the national proxy score.

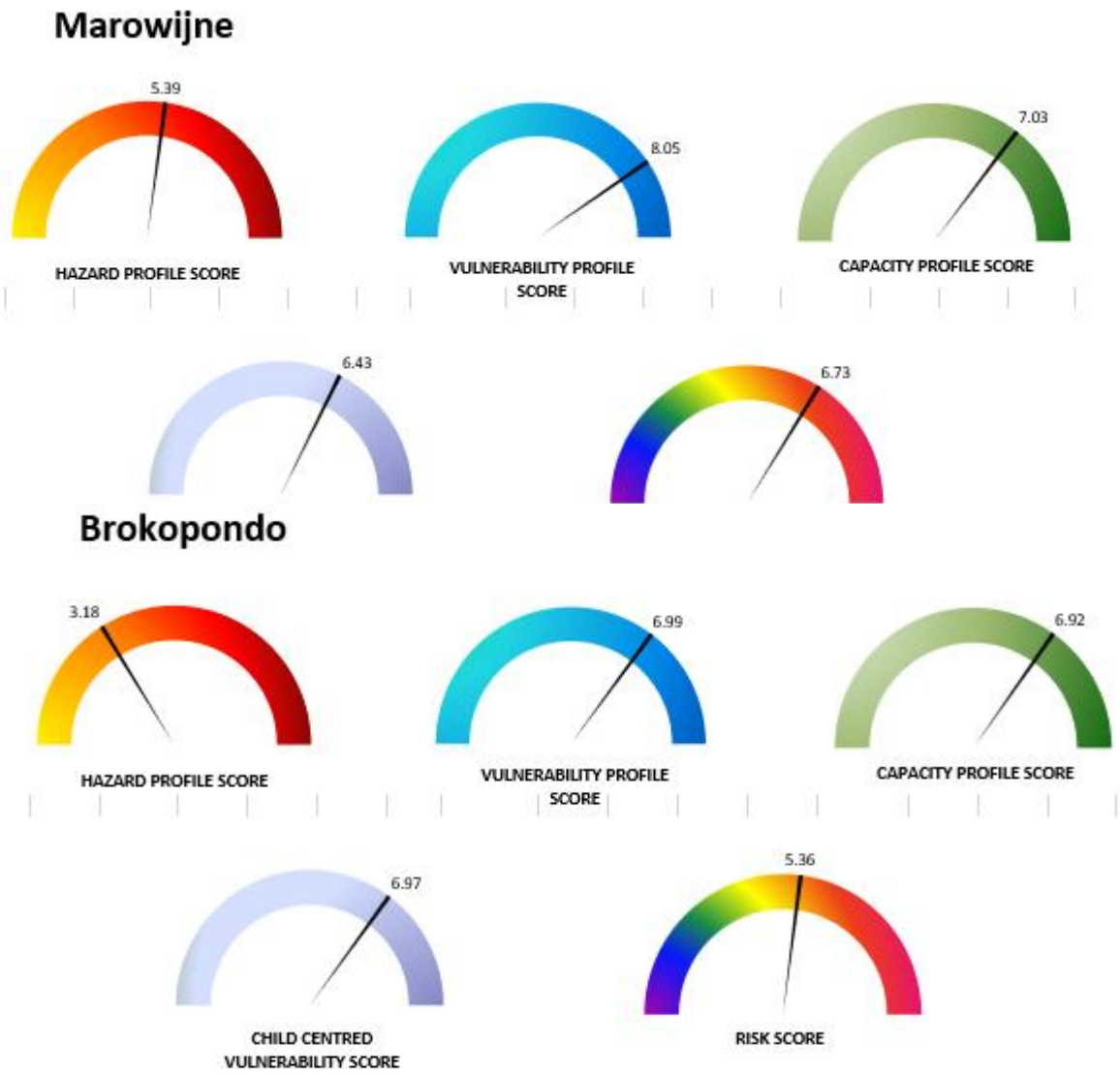

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Figure 3 District speedometer for Brokopondo

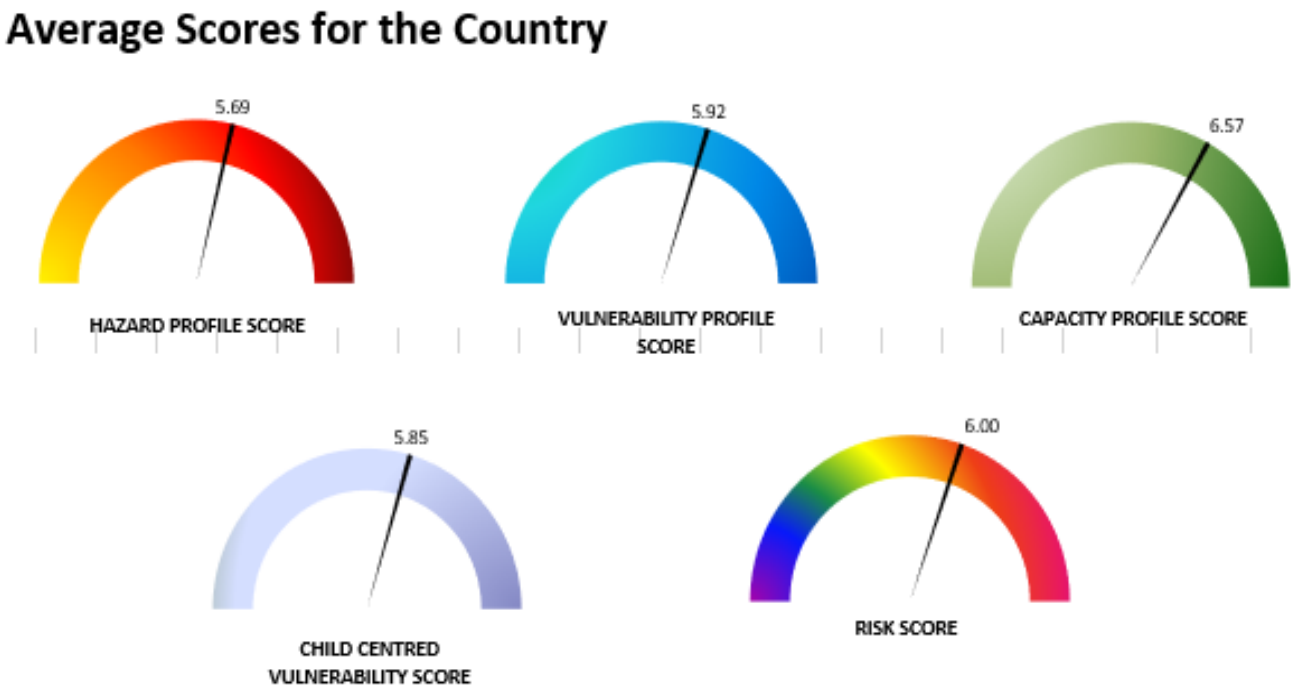


Figure 5 Dashboard for Suriname

4.2 Verification and validation session with NCCR, Steering Committee and District representatives

A verification session was held at the NCCR conference room on the second day of the verification mission. This session was held with representatives of NCCR, the national Resilience Steering Committee and UNICEF. This was attended by Colonel Jerry Slijngaard, Ms. Dulci Duurham, Mr. Ian Jones, and representatives from the National Resilience Steering Committee. This session was successful in that there were no strong objections to the results projected for Nickerie, Para and Wanica. The results of this exercise are further detailed in the associated verification mission report.

4.3 Complete at least one Risk Profile to be used in other districts

A risk profile was submitted for Marowijne and a hazard profile was submitted for Brokopondo. The Brokopondo hazard profile report represents an addition to the deliverables listed in the TOR. The risk profile generated for Marowijne will serve as a model for other districts in Suriname, and the wider CDEMA PS region. This profile sought to detail the many factors influencing risks in a given district; and in this initiative those closely associated with

children. It is intended to provide input into the national and district level planning for reducing risks and increasing resilience.

4.4 Document or update existing documentation on best practices/lessons learnt

Lessons learned encapsulate the key features of conducting this consultancy inclusive of advancing the application of risk information tool and is detailed as part of this report. A key lesson related primarily to logistics for entry and exit from Suriname and may be of interest to future consultants and the future application of this methodology in Suriname. A key recommendation was that some of the indicators should have more numerical options to allow for a wider range of responses. For example, the indicator '% of HH (households) deemed structurally unsound' under the sub-component of Structural Vulnerability, only possessed responses up to >5%. It was suggested that more options be made available for this and other similar indicators. Further details of lessons learned are given in section 9.

4.5 Handover session with the NCCR to ensure transition of key documents and information on processes and key partners to be involved

The handover session was held on 21st August with the NCCR, members of the National Steering Committee and other stakeholders. The handover session served to discuss the structure of the CCRIT tool, identify key areas for data input within the tool, discuss application strategies, and identify key areas relating to the maintenance of the CCRIT tool. As a result, the NCCR will incorporate the data driven CCRIT machinery into its wider disaster risk reduction programming.

5. Methodology and Application of CCRIT

This application report describes the procedure undertaken in the application of the Child Inclusive Caribbean Community Risk Information Tool (CCRIT) in Suriname in 2018. This information tool aims to facilitate the use of data to drive evidence-based decision making in Suriname by addressing risk across various sectors and divisions of interest. Under this stage of application of the methodology, CCRIT was applied in the districts of Brokopondo, Marowijne and Sipaliwini.

As an integral part of this procedure, the application of the CCRIT methodology included two missions to Suriname. The first mission involved the verification of the results obtained in the districts of Para, Wanica and Nickerie, as well as data collection in Marowijne and Brokopondo. Mission two was conducted to facilitate handover of the updated database and other documents generated.

Throughout this process, best practices were also identified. The consultant also produced a disaster risk profile for the district of Marowijne; presenting key findings and trends from the data collected. This report included maps and analysis revealing pressing risks throughout the district. Key findings and results are detailed below in this report, as well as trends.

Finally, the application report describes Stakeholder Perception and Challenges, as well as Lessons Learned and Recommendations aimed at enhancing the CCRIT application process in Suriname. The lessons learned will also inform further application of the tool in other CDEMA Participating States.

Execution of this consultancy was divided into 4 phases; Introductory, Application and Analysis, Verification, and Documentation and Handover Phases. *These phases of implementation were not distinct, with multiple phases occurring concurrently.* This was essential due to the iterative nature of data collection, analysis and verification.

Introduction Phase

This phase was kicked off with the lead institution the NCCR coordinating the collection of data from the identified and targeted districts. A request was made to the respect District

Commissioners outlining the initiative and the type of data required. Commencement of the project in Suriname however, including the active engagement of NCCR to roll out the methodology, began with an inception meeting. This meeting took place on the 7th May, by videoconference during the period allocated for the verification mission.

The inception meeting detailed prior findings of the CCRIT tool application in Suriname. This meeting also elaborated on the approach to rolling out the methodology in Brokopondo, Marowijne and Sipaliwini, as well as the plan to finalise the verification of data collected in the districts of Para, Wanica and Nickerie. Introduction also concerned the revision of the toolkit, including heightening understanding of the data required to be collected. Additionally, logistical matters were addressed to facilitate the data collection missions. After the inception meeting was complete and these areas for discussion elaborated on, the introductory phase gave way to the application phase of the methodology,

Application Phase

Data was collected on the 9th and 10th May, in Marowijne and Brokopondo respectively. Following each collection exercise the toolkit was revised to reflect the newly incoming data. The tentative choropleths and other charts, using QGIS and MS Office, were also revised as data became available.

NCCR was tasked with facilitating data collection in the district of Sipaliwini. Data for the ressorts of Boven Coppename, Boven Saramacca, Boven Suriname and Coeroeni in Sipaliwini were collected and forwarded to the consultant on the 12th August for input in the CCRIT tool. This left data for the ressorts of Tapanahony and Kabalebo omitted from the final analysis.

Verification Phase

A verification session was held at the NCCR conference room on the 8th May. In this meeting the results from the previous applications of the CCRIT methodology were presented and discussed. After the presentation of findings, a short verification session was held where the results obtained for the districts of Nickerie, Wanica and Para were discussed; with members of the National Resilience Steering Committee corroborating the data collected. This session

was vital step as it allowed the results of the data collected to be checked against stakeholder expectations. During this process, gaps or incorrect responses to indicators were identified by stakeholders from the National Resilience Steering Committee. This aided in assisting in the data collection process as national stakeholders were identified as the custodians of the data required.

Documentation and Handover Phase

As part of the documentation and handover phase, a risk profile was developed for the district of Marowijne, using the results gathered during the application phase. This risk profile detailed the major findings, trends and results generated from the application of the CCRIT tool in the district, by considering the components of Hazard and Exposure, Vulnerability Child Vulnerability and Capacity. Under each of these components of the CCRIT tool and the risk profile report, constituent parameters and findings were identified and discussed.

The verification, and final consultant reports were also developed during this phase of the methodology. These reports aimed to detail the procedure utilised in the completion of these phases of this exercise. These reports provide a suggested outline of how the CCRIT tool can be implemented in other districts, through following the procedure used during this iteration of the methodology.

In addition to the deliverables designated by the terms of reference of this consultancy, the consultant also prepared additional documentation to support the verification session, the presentation of results and the handover session. During the handover, a presentation of the revised current state of the tool was completed, as well as documentation as to some critical steps to maintaining the database and applying the tool to the district of Paramaribo.

6. Key Outputs

The results generated from the application of the CCRIT methodology are pivotal in providing information to decision makers as to the likely priority areas in need of action for risk reduction and preparedness in Suriname. These results, in the form of indices, provide useful information on possible trends in the areas of vulnerability and capacity; and possible gaps across districts. The presentation of findings below seeks to highlight the overall results, key findings and trends identified in the application of the CCRIT methodology in Brokopondo, Marowijne and Sipaliwini; as well as simply identifying how these results fall in line to the prior results collected in the districts of Commewijne, Coronie, Saramacca, Para, Nickerie and Wanica.

The results are quantified on a scale of 1 to 10 for each component of risk, and overall risk itself. The increase in score from 1.00 upwards indicates greater priority for enhancement, as judged by the indicators of the Child-Inclusive CCRIT.

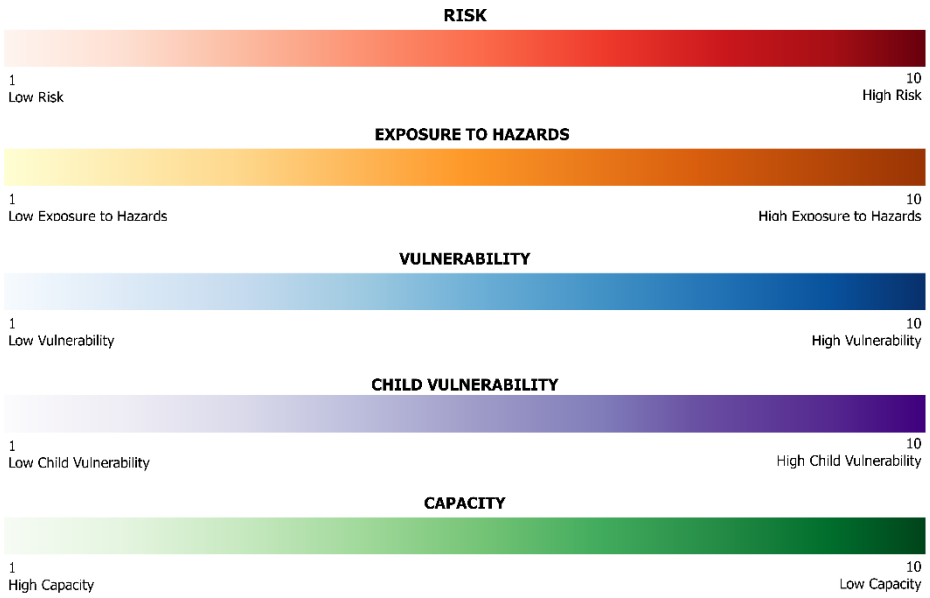


Figure 6 Showing the scales used in calculating indices, and corresponding colour ramps

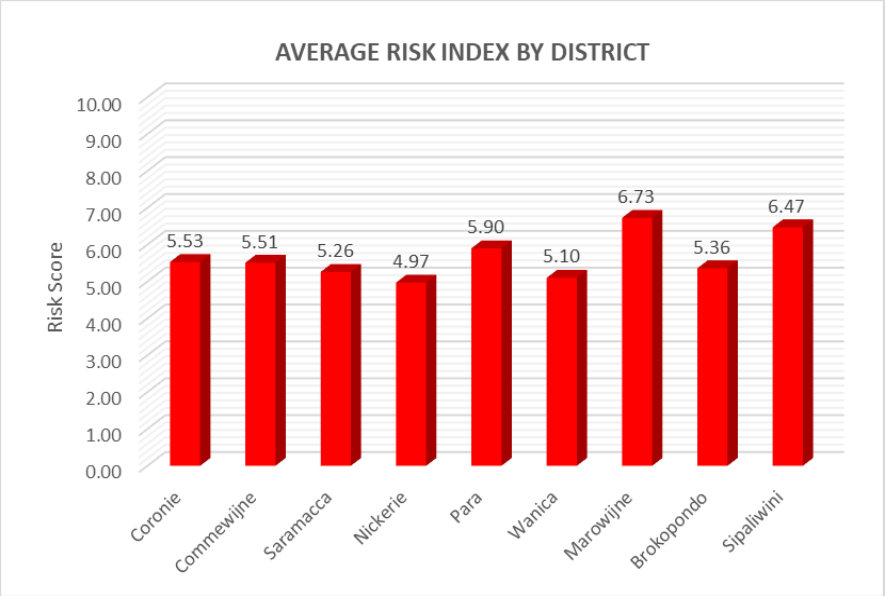
Table 1 Showing national averages

Component	Score (1 – 10)
Exposure to Hazards	4.76
Vulnerability	5.84
Child Vulnerability	5.84
Capacity	6.66
Risk	**5.65**

The scores given to all indicators within each component aided in the generation of sub-component scores, component scores and attributed to the overall risk score. As nine of ten districts in Suriname have had this tool applied, the scores generated can be seen as the best estimated representation of the national average of CCRIT scores in the areas of Exposure to Hazards,

Vulnerability, Child Vulnerability, Capacity and overall Risk index. The scores generated are listed in the accompanying table.

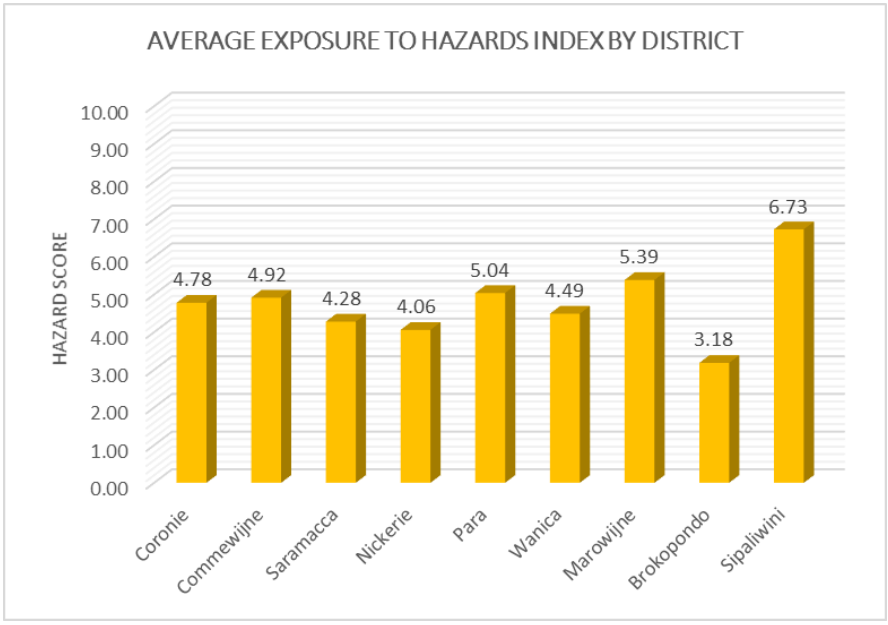
Overall Risk



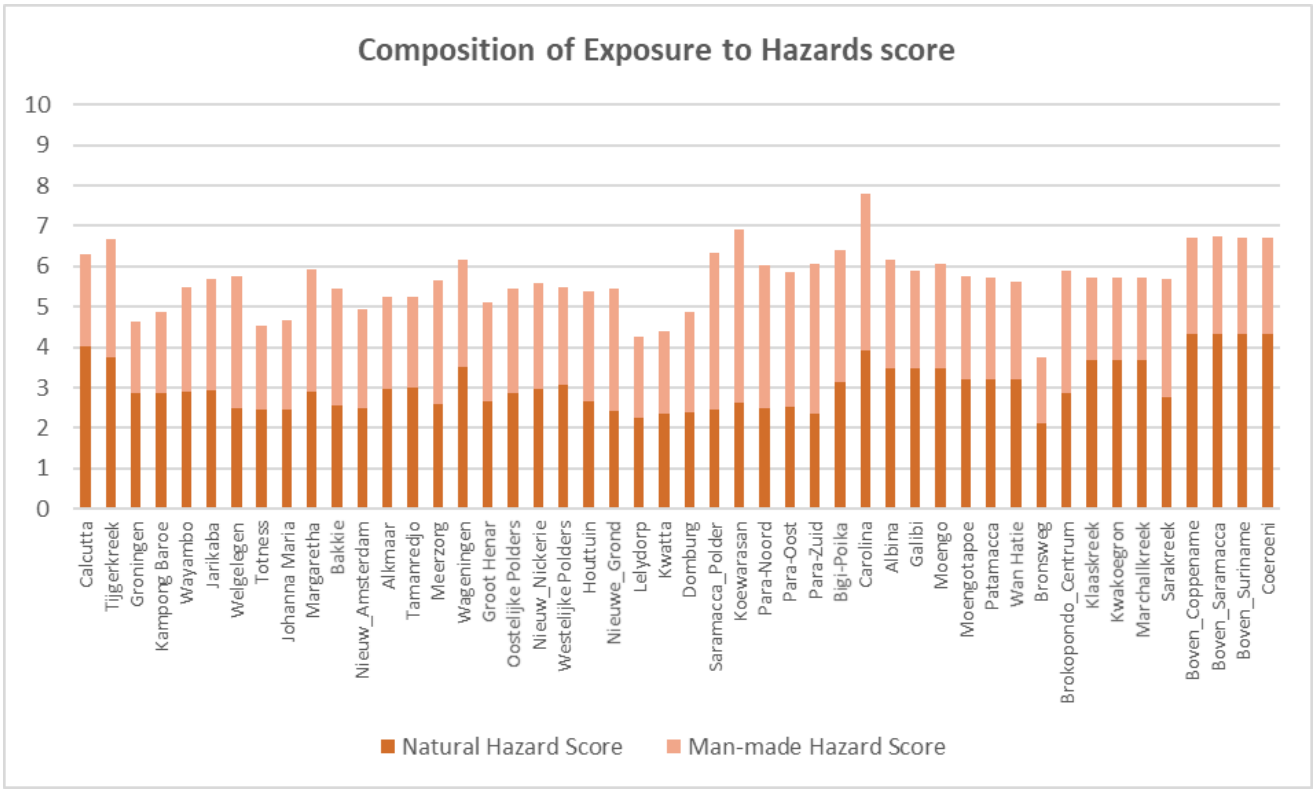
The overall risk score for each ressort was generated automatically upon input of responses to the indicators within each section. Therefore, discussion of the reasons for the scoring will be discussed within the discussion for each component. The overall risk index ranged between **4.97** and **6.73**. It was observed that the average district risk score was found to be 5.65 and represents the average risk score for the entire country. Aggregate risk was found to be most influenced by a lack of capacity, described by the Capacity score. Incidentally, the scores for Child Vulnerability and Vulnerability were found to be the same, however it should be noted that the overall score for Child Vulnerability is inflated due to the lack of data available for multiple indicators.

Exposure to Hazards

Overall, the effect of exposure to hazards attributed the least to the risk index. The average score for this component, comprised of equal weighting of natural and man-made hazards, was found to be **4.76** with a standard deviation of 0.92. The lowest score for hazard exposure and frequency was scored by Brokopondo with 3.18, while the highest was scored by Sipaliwini, with a score of 6.73. It should be noted that the data collected for the first six districts to which the Child-Inclusive CCRIT methodology were applied possessed scores which showed relatively small variability.



Man-made hazards were assessed as less of an area of concern in the districts of Brokopondo, Marowijne and Sipaliwini, indicated by a lower score for this sub-component for each ressort of these districts than the component of Natural hazards. This observation is generally the case for all districts and ressorts of Suriname.

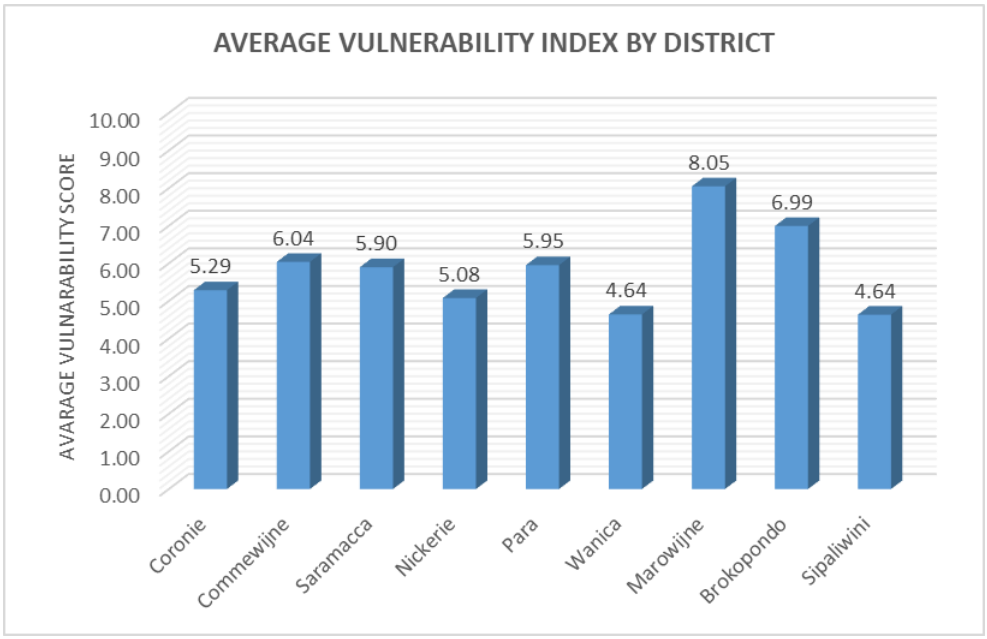


The district of Brokopondo possessed the lowest exposure to hazard score of all nine districts in which the Child-Inclusive CCRIT methodology has been applied. However, residents were concerned about the effects of mercury contamination in water, soil, flora and fauna; and ultimately human life in the district. The low CCRIT hazard score was due to the absence of hazardous events such as floods, droughts, severe storms, extreme temperatures and plagues in this district, and the relatively low hazard posed by other areas of consideration within both natural and man-made hazards.

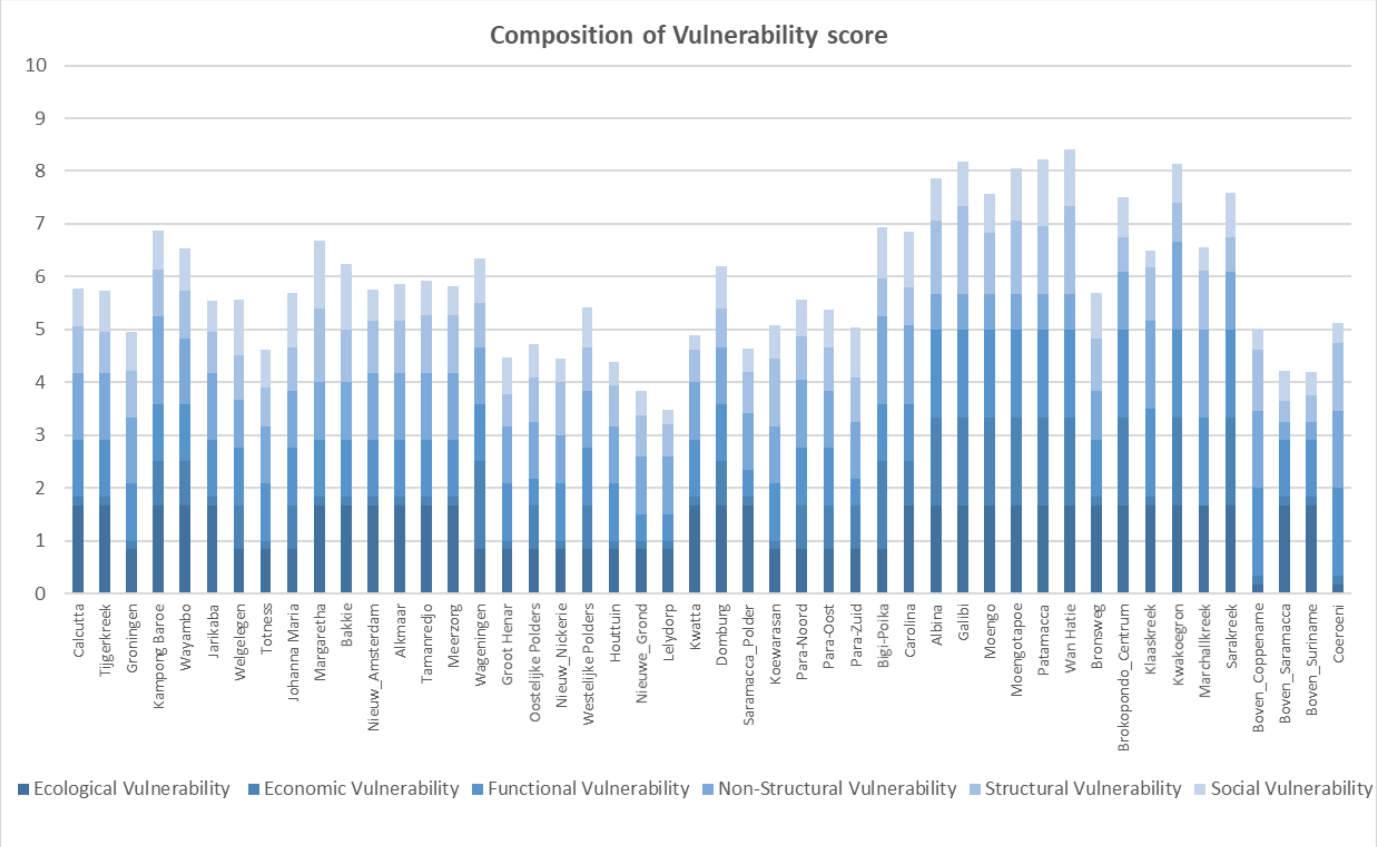
In the district of Marowijne, the effects of flooding, droughts and the susceptibility of the populations of the district to vector borne illness caused the Exposure to Hazards index to be 0.42 points above the average Exposure to Hazard score. This increase indicates that the district has generally adjudged more susceptible to hazards, particularly flooding, than average. The greatest increase from the average Exposure to Hazard score of all the districts was found in the district of Sipaliwini. This average was 6.70, 1.94 points above the mean due to the highest exposure to natural hazards in this district. However, it should be noted that this average was determined by considering the data for just four of the six ressorts; Boven Suriname, Boven Saramacca, Boven Coppenname and Coeroeni. Numerically, the number of hazards of consideration in Sipaliwini were much less than in other districts. However, the hazards that are relevant to the communities in this district were gauged as being severe. This was observed through the scores for Natural Hazards, in particular, where only strong winds and floods were considered. Strong winds was given a score of 10.00 and flooding 7.3 in all ressorts in Sipaliwini. Within the area component of Man-made hazards, (Extinction of Flora and Fauna Species) and Intoxication were assessed as being 10.00 on the hazard severity scale, and the issue of Water Pollution at least 8.00 in all the ressorts. While it was identified that there is a more diverse array of Man-made Hazards of importance in Sipaliwini, many of these hazards were not assessed as being major components of the overall hazard score.

Vulnerability

In terms of Vulnerability score, the average vulnerability assessed by application of the Child Inclusive CCRIT methodology was found to be **5.84.** Vulnerability was assessed along six criteria; ecological, economic, functional, structural, non-structural and social vulnerabilities, and each criterion was allotted an overall score which contributed equally to the final vulnerability score.



The district of Marowijne was found to have the highest vulnerability score of the nine districts of Suriname to which the Child-Inclusive CCRIT tool was applied. This was particularly due to the extremely high vulnerability scores in the areas of ecological, economic, functional and structural vulnerability; with the first three areas



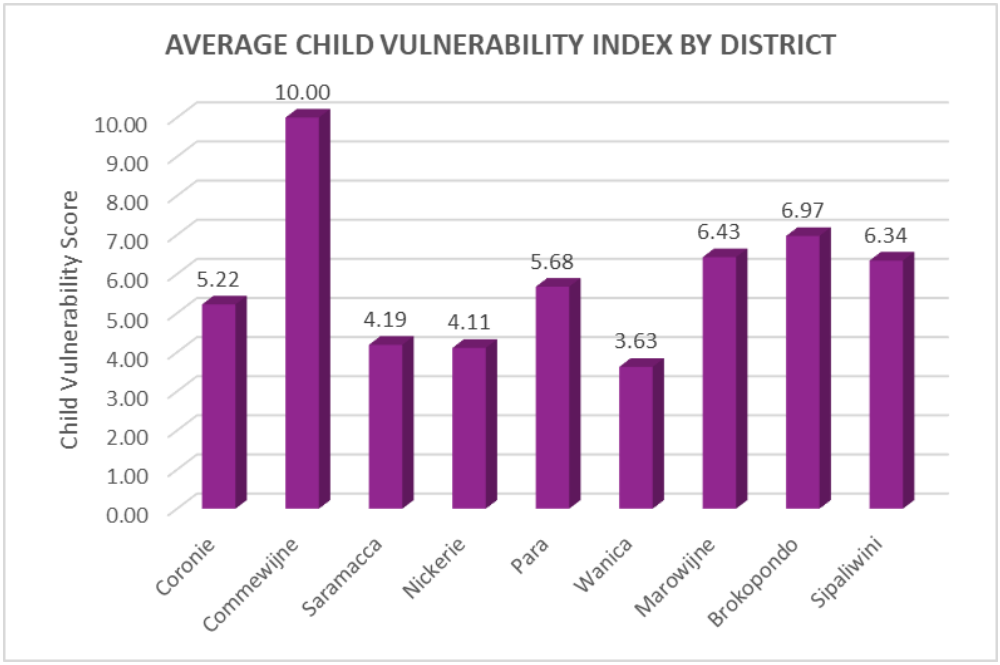
possessing the maximum score of 10.00 in all ressorts. Ecological vulnerability was assessed by the existence of a municipal land-use policy or plan, of which no ressort in Marowijne has. In terms of economic vulnerability, the figures on the employment rate in the district were not available at time of completion of this report. This absence of information led to the score for this component of vulnerability suffering from the penalty given to a lack of response in the worksheet. Functional vulnerability was affected by the lack of availability of access to resources and the absence of endorsed contingency plans. Finally, within the component of structural vulnerability the indicators under consideration relate to infrastructure. While the overall score for structural vulnerability was found not to be the maximum score, it was very close, at 8.00. This was primarily due to the absence of roads to access the ressorts of Galibi and Wanhatti, as only boats could be used to access and leave these ressorts.

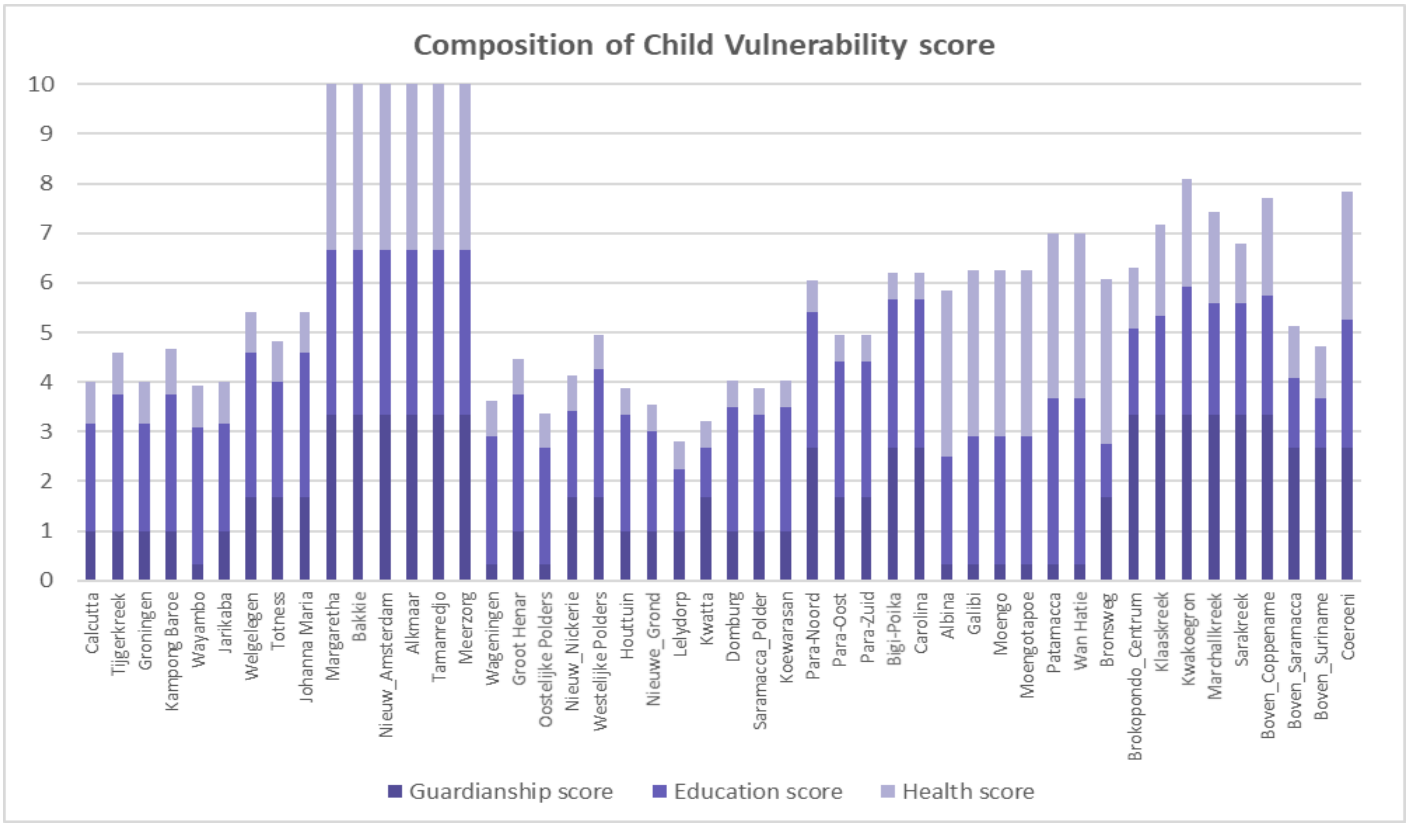
Brokopondo also possessed a vulnerability score greater than the proxy national score. This was primarily due to absences of resources relating to ecological vulnerability, functional vulnerability, non-structural vulnerability, and to a lesser extent, structural vulnerability. The areas in need of development relating to ecological vulnerability and functional vulnerability were the same as in the district of Marowijne. However, the component of non-structural vulnerability did not perform as well as the district of Marowijne. In Brokopondo, three of the six ressorts possessed an overall score of 10.00, indicating that there is much work to be done in this area. The indicators relating to non-structural vulnerability concerned the existence of risk transfer mechanisms for properties and livelihoods in the area and the existence of laws and regulations related to planning. In the ressorts of Brokopondo Centrum, Sarakreek and Brownsweg there are draft laws related to planning, but only in Brownsweg did respondents indicate that insurance was available for properties. In terms of structural vulnerability, the ressorts all experienced a reduction in the overall score for this sub-component of vulnerability due to the proportion of households that were deemed structurally unsound, determined as being greater than one percent of homes, and the absence of purpose-built structures in Marchallkreek and Klasskreek.

In Sipaliwini, average vulnerability calculated using data from the four ressorts where data was available was found to be much less than the national average. This was due to far lower than average ecological, economic and social vulnerabilities. Due to the existence of forest reserves, and the Central Suriname Reserve being declared a UNESCO World Heritage site, there are ecological protections in place in Sipaliwini. These protections mainly address the reserves, and thus the ressorts of Coeroeni and Boven Coppename in which they are found.

Child Vulnerability

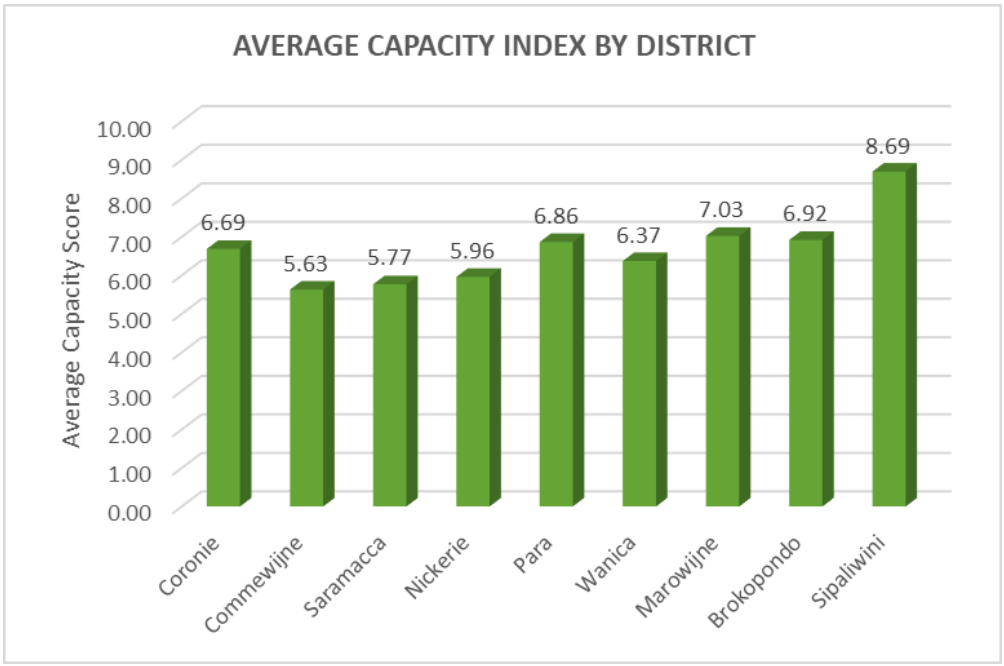
Child Vulnerability remains the component of the CCRIT risk index that possesses the most gaps in data. From the prior iteration of this methodology, all data for the district of Commewijne relating to Child Vulnerability is missing. During this application of the methodology, these data points could not be added to the tool, nor was it possible to collect some data for the districts of Brokopondo, Marowijne and Sipaliwini related to educational vulnerability, health vulnerability and child vulnerability relating to guardianship. Therefore, the overall child vulnerability scores for these districts, Commewijne, Brokopondo, Marowijne and Sipaliwini are not true reflections of the child vulnerability within these districts, nor can the average national score be interpreted as the true representation of the national average. However, using the data collected, and the penalty scores generated by the sheets for the gaps, the national Child Vulnerability proxy score was found to be **5.84**.





Capacity

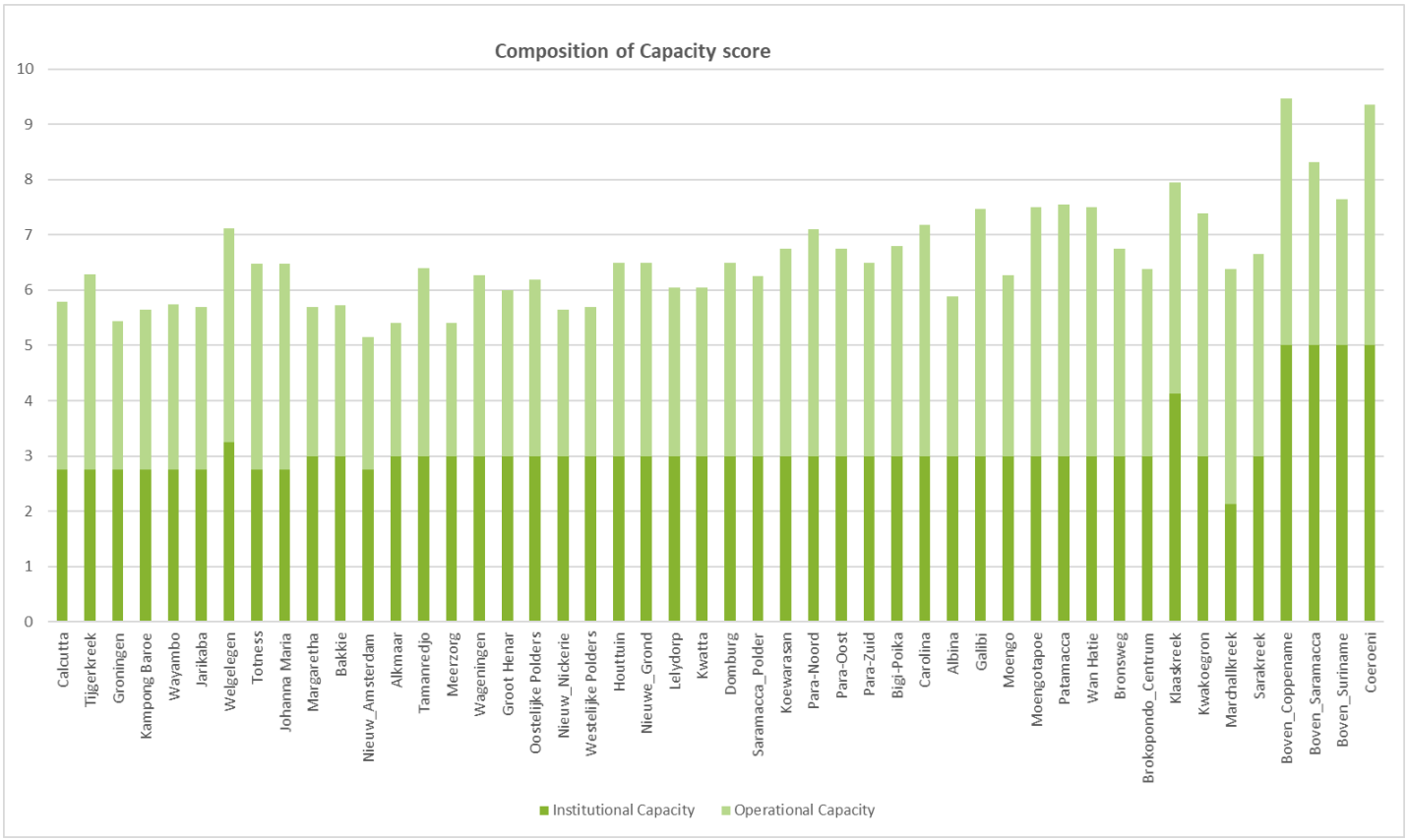
Finally, the component of Capacity was considered. In this component the indicators concerned the capacity in place in the districts along the themes of operational capacity and institutional capacity. Institutional capacity was assessed within two key elements; governance and the integration of CDM. It was observed that in most ressorts there was a void knowledge relating to CDM. In terms of governance, the indicators concerned the legal framework and basis for CDM and CDM policies, as well as the level of organisation within the ressorts.



Operational capacity is an area

of weakness for Suriname and is one of the poorest performing sections of the entire tool. The scores for operational capacity were most affected by the lack of funding for CDM at the ressort level. No ressorts throughout the nine that have had the Child-Inclusive CCRIT methodology applied had an allocated budget for CDM.

The next area most in need of attention within Capacity is Early Warning Systems (EWS). The average score for this key element was **8.10**, calculated using the data collected for the nine districts that have scores. The indicator for EWS questioned the existence of a comprehensive EWS in the ressorts. It was determined that in most ressorts either no EWS existed or an adhoc EWS was in place. Four ressorts, of all in Sipaliwini, Marowijne and Brokopondo, had EWS in place for one hazard. These were Moengo and Albina in Marowijne, and Boven Saramacca and Boven Suriname in Sipaliwini. There was also an absence of skilled personnel present within districts, particularly in rural ressorts. This trend was observed throughout the districts to which this methodology was applied. Finally, information communications technology penetration was observed a being the area of major strength within the capacity phase of



reporting.

7. Stakeholders' feedback and challenges in applying the CCRIT tool and methodology

Various benefits of CCRIT, and the application of the tool, were identified by stakeholders.

1. Stakeholders were impressed with the overall comprehensiveness and ease of use of the CCRIT tool
    - During application of the tool in Brokopondo, members of the district committee voiced satisfaction that through entering the data points into the MS Excel workbook that a score generated by considering multiple components could be produced. The generation of scores for the components allowed stakeholders to understand the effect of the various components on the overall score obtained for the resorts of Brokopondo.
    - Stakeholders also identified that the use of few indicators allows for ease of application. There were no complaints as to the choice of existing indicators in the tool, however there were many suggestions as to indicators that should be included in the tool. These suggestions included indicators relating to child suicide rates, cases of reported child sexual abuse and child labour.
2. Holding a verification workshop in which the stakeholders came together to discuss the results facilitated easy collaboration and information sharing. In addition to this, the verification mission workshop allowed NCCR and members of the steering committee the ability to learn to utilise the tool for themselves, improving familiarity and the potential for future implementation in country. This mission was considered a vital, positive part of this methodology.
3. The ability to add areas of focus to the country was seen as a positive, as it allowed the tool to be responsive to the priorities of countries applying it.
4. The ability to omit indicators, primarily in the component of Exposure to Hazards was praised. Omitting hazards not applicable can be done without a penalty to the score.

In terms of challenges, these primarily relate to data collection and gaps. It should be noted that multiple gaps exist throughout the documentation.:

1. Within the district of Sipaliwini, data was collected in some part for four of six ressorts. Outstanding ressorts within this district were Tapanahony and Kabalebo. However, even within the districts of Sipaliwini in which data has been collected, gaps do still

exist. These gaps are primarily within the components of Child Vulnerability and Vulnerability. Outstanding data is not an issue specific to district of Sipaliwini. These data points, within the components of Vulnerability and Child Vulnerability, encompass indicators concerning childhood education, healthcare and access to social services.

2. Large portions of data are still outstanding in the component of Child Vulnerability. The absence of this data is especially apparent in the district of Commewijne, in which there is no Child Vulnerability data. In Brokopondo, Marowijne and Sipaliwini there is some Child Vulnerability data available, but many of the indicators, particularly relating to health vulnerability, are not answered. The agencies who are custodians of the missing data for these sections have been identified.

8. Lessons Learned and Recommendations

Throughout this process, several recommendations were made by stakeholders and other involved parties. These recommendations seek to ameliorate the Child-Inclusive CCRIT and the application process. These include:

- More options suggested for structural vulnerability
    - Within the sub-component of vulnerability on the topic of structural vulnerability it was verbalised that the responses for the proportion of houses deemed structurally unsound in the area should have more numerical options. Although a response of greater than 5% of homes being structurally unsound generated the maximum score of 10.00, respondents requested choices greater than 50%, should this be possible. The revision of options and as responses to indicators and scores can be considered prior to future implementation if deemed necessary.
- More indicators for Child Vulnerability
    - Inclusion of sensitive areas of consideration that speak to the vulnerability of children in the areas of child abuse, child sexual abuse, child labour and psychosocial or mental health issues, such as suicide rates.
- Unlocking the tool
    - It was requested that the tool (in MS Excel) be unlocked to facilitate additions of other pertinent areas of consideration, for Suriname and the wider CDEMA PS region.
- Averaging as an issue
    - Investigation of the use of averaging within the components of Vulnerability, Child Vulnerability and Capacity as all sub-components contribute to the overall component score equally even though a sub-component may be represented by a single indicator and others within the same component by many indicators.
- Districts keep a database of events
    - Districts can be supported and encouraged to establish simple databases within MS Word or MS Excel on disaster event types, scale, severity, those affected and other parameters. This can be used to provide critical information for similar data gathering exercises.

- Presentation of findings
    - It may be beneficial in future applications of the tool to present the findings to a wider audience of national stakeholders, district representatives and district residents during the handover process

Appendix 1

Key Persons involved and present in CCRIT application, verification and handover 2018:

Name	Organisation
Colonel Jerry Slijngaard	NCCR
Dulci Duurham	NCCR
Humphrey Blinker	National Resilience Steering Committee/IFRC
Gaitrie Usha Satnarain	National Resilience Steering Committee
Jamilla Zebeda	National Resilience Steering Committee
Maikel Yorks	National Resilience Steering Committee
David Singh	National Resilience Steering Committee
Samoender Iwan	National Resilience Steering Committee

Appendix 2

List of indicators used to delineate sub-components of the components of Child-Inclusive CCRIT Risk Score and their associated scores

Demographic Data

Urban Rural Peri-urban	Location	Coastal Coastal plain Inland

Exposure to Hazards

For all hazards the following rubric was utilised

Frequency	certain - occurs every year	10
	occurs most years	8
	occurs once or twice in 10 years	6
	has occurred but a long time ago	4
	has never occurred but could occur	2
	not applicable	0
Scale	affects all the population	10
	affects most of the population	8
	affects less than half of the population	6
	affects small groups of households	4
	affects individual households	2
	nothing affected	1
Severity	Catastrophic death, injury or public health; OR infrastructure destroyed; assets lost	10
	Some deaths, injury or major public health problem; OR major damage; assets lost	8
	Few deaths, some injury; OR moderate damage/losses	6
	Minor injuries only; OR minor damage/losses	4
	No impact on humans OR damage to infrastructure.	1
	not applicable	1

Vulnerability

Ecological	Existence of municipal land-use policy or plan	Enforced or implemented	1
		Enacted or endorsed	3
		Draft document	5
		No plan or policy	10
Economic	% of persons employed	> 75%	1
		50%	5
		< 25%	10
Functional	Existence of endorsed contingency plans	Endorsed Plan	1
		Draft plan	3
		No plan	10
	Access or capacity to access resources?	Full access	1
		Limited access	3
		No access	10
Non-structural	Existence of laws, regulations (related to planning)	Enforced regulations	1
		Enacted law & regulations	3
		Enacted law only	5
		Draft law & regulations	8
		No law & regulations	10
	Existence of insurance for properties	> 25%	1
		< 25%	5
		None	10
	Existence of insurance for livelihoods	> 25%	1
		< 25%	5
		None	10
Structural	# of access routes to municipality	> Two routes	1
		Two routes	3
		One route only	5
		No access routes	10
	# of purpose built structures	> Two buildings	1
		Two buildings	3
		One building	5
		None	10
	% of HH deemed structurally unsound	> 5%	10
		< 5%	5
		< 1%	3
		None	0
Social	ratio of employed persons (women:men)	> 1:5 ratio	10
		1:5 ratio	8
		1:3 ratio	5

		1:2 ratio	3
		1:1 ratio	1
	Existence of Social Safety Nets	Accessible	1
		Ad hoc arrangements	3
		Do not exist	10
	% of ppl with secondary education	> = 50%	1
		> 25%	3
		> 10%	5
		< 5%	8
		0	10
	# of clinics at the local level	> Two clinics	1
		Two clinics	3
		One clinic	5
		No clinics	10
	% of HH with access to potable water	> 50%	1
		> 25%	3
		> 10%	5
		< 5%	8
		0	10
	% of HH with basic sanitation facilities	> 75%	1
		> 50%	3
		>25%	5
		>5%	10
	Methods in place to dispose waste from sanitation facilities1	Methods in place and being used	1
		Methods in place, somewhat utilized	5
		No methods in place, disposal techniques vary	10
	% of HH relying on rivers for main source of potable water	> 20%	10
		10%-20%	8
		1% -10%	5
		1%	3
		< 1%	1
	% of HH with an available supply of drinking water within 30 mins round trip	> 75%	1
		> 50%	3
		>25%	5
		>5%	10
	Ratio of crime to local level	High	10
		Medium	5
		Low	3
		Non-existent	1

Capacity

Level of organization	Clearly documented & articulated roles	1
	Ad hoc	3
	Non existent	10
Legal Framework	Enshrined in law	1
	In draft	3
	Non existent	10
Level of awareness	Integrated into work plan	1
	Hosted/participated in workshops	3
	No knowledge of CDM	10
# of plans developed	More than 2	1
	1 plan developed	3
	No plans developed	10
% of budget for DM	More than 1 %	1
	Less than 1 %	5
	No budget	10
Accessible inventory in existence	Inventory accessible	1
	Ad hoc inventory system	3
	None exists	10
Dedicated equipment/tools	Tools identified & accessible	1
	Ad hoc access to tools	3
	No access to tools	10
Proportion of individuals with use of a mobile telephone	> 75%	1
	≥ 50%	3
	< 50%	5
	< 25%	10
Proportion of HHs with access to internet	> 75%	1
	≥ 50%	3
	< 50%	5
	< 25%	10
Proportion of HHs with electricity	> 75%	1
	≥ 50%	3
	< 50%	5
	< 25%	10
Proportion of HHs with a radio	> 75%	1
	≥ 50%	3
	< 50%	5
	< 25%	10
Proportion of HHs with a TV	> 75%	1
	≥ 50%	3
	< 50%	5
	< 25%	10

# of persons trained in DM	> 1% trained	1
	1% trained	5
	0 trained	10
# of teams trained in DRM	> 2 Teams	1
	2 Teams	3
	1 Team	5
	0 Teams	10
Comprehensive EWS	MHEWS exists	1
	EWS exists for 2 hazards	2
	EWS exists for 1 hazard	3
	Ad hoc EWS exists	5
	No EWS exists	10

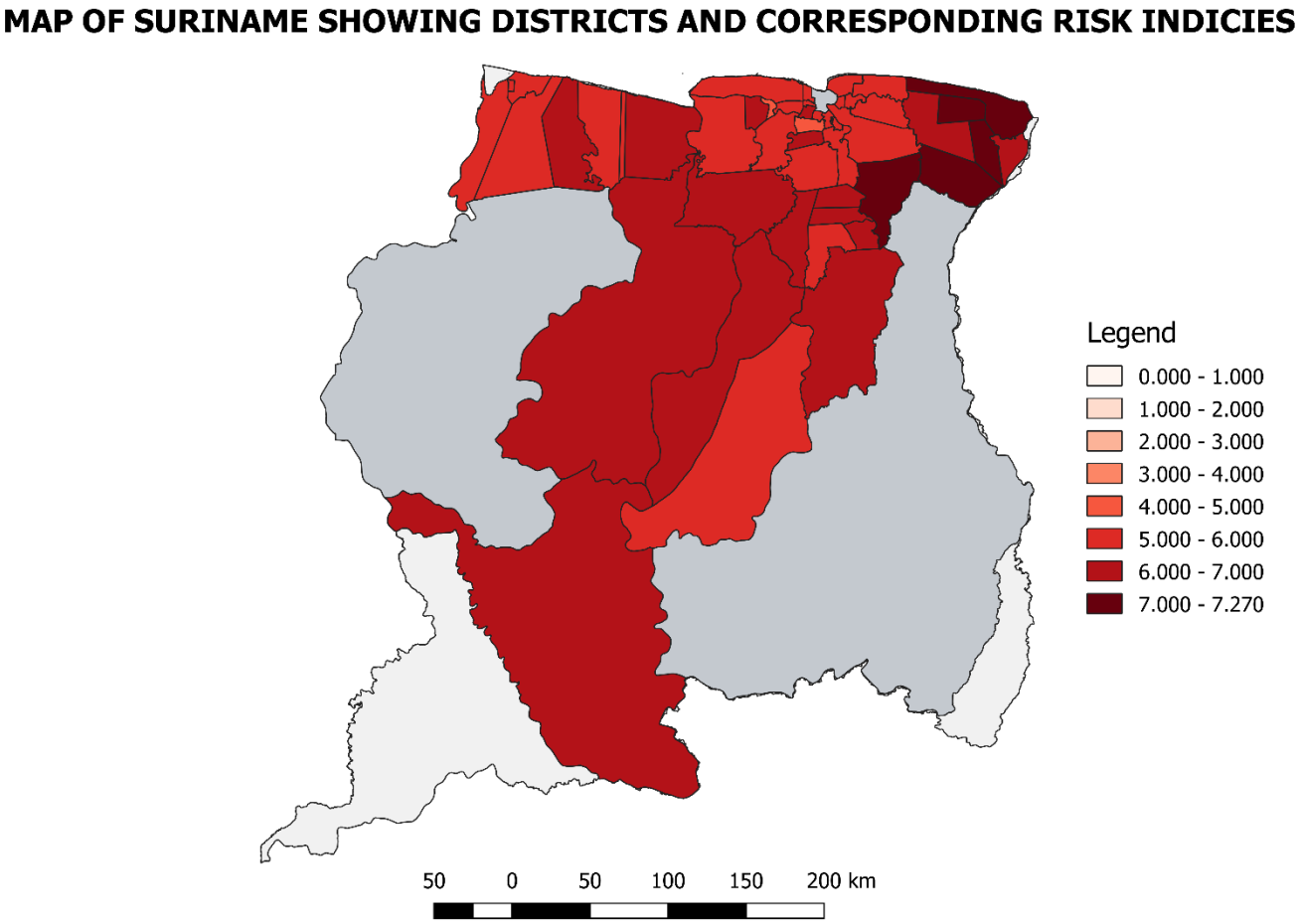
Child Vulnerability

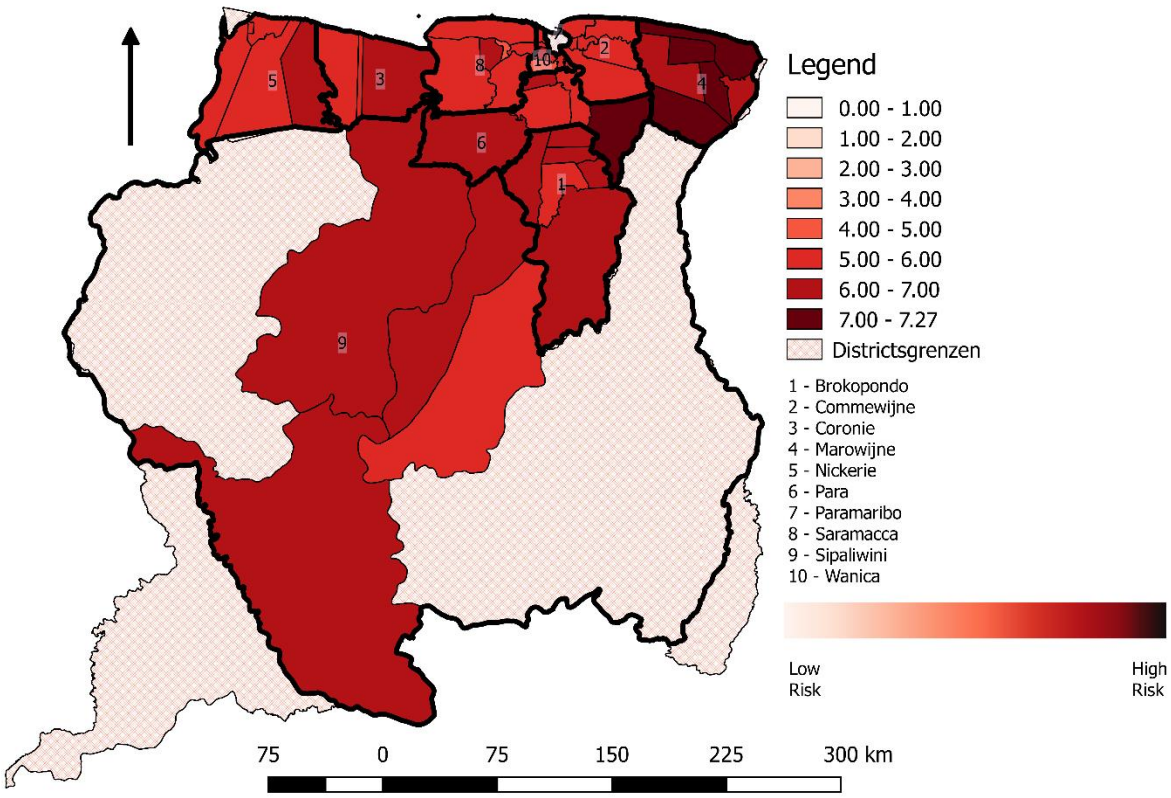
Education	# of early childhood centres	>3	1
		3	3
		2	5
		1	8
		None	10
	# of libraries and learning resource centres	>1	1
		1	3
		None	10
	out of school rate children 5-12	> 10%	10
		5%-10%	8
		1% -5%	5
		1%	3
		< 1%	1
	out of school rate children 13-17	> 10%	10
		5%-10%	8
		1% -5%	5
		1%	3
		< 1%	1
	% of children 5-17 who know one or more procedures to do in a disaster	> 50%	1
		> 25%	2
		> 10%	3
		< 5%	5
		0	10
Health	% of children not receiving the DPT vaccine in the first year of life	< 75%	10
		< 50%	5
		< 25%	3
		< 5%	1
	% of children receiving full	< 75%	1
		< 50%	3

	immunization according to national schedule by age 24 months	< 25%	5
		< 5%	10
	% of children aged 17 not up to date with vaccination	< 75%	10
		< 50%	5
		< 25%	3
		< 5%	1
	% of women indicating that they did not breastfeed at all during one or more of their births	< 75%	10
		< 50%	5
		< 25%	3
		< 5%	1
	adolescent birth rate		
	access to HIV/STD education	Integrated into curriculum	1
		seasonal workshops	5
		no access to HIV/STD education	10
	homes with basic sanitation facilities	> 75%	1
		> 50%	3
		> 25%	5
		> 5%	10
	access to contraception	readily available	1
		restricted access	5
		no access to contraception	10
	number of children under 5 years at least two standard deviations from the mean weight for their age group (moderate and severe wasting)	> 10%	10
		5%-10%	8
		1% -5%	5
		1%	3
		< 1%	1
	number of children under 5 years at least three standard deviations from the mean weight for their age group (severe wasting)	> 10%	10
		5%-10%	8
		1% -5%	5
		1%	3
		< 1%	1
Other (Guardianship)	% of children not living with any biological parents	> 10%	10
		5%-10%	8
		1% -5%	5
		1%	3
		< 1%	1

Appendix 3

Graphical Representations of results

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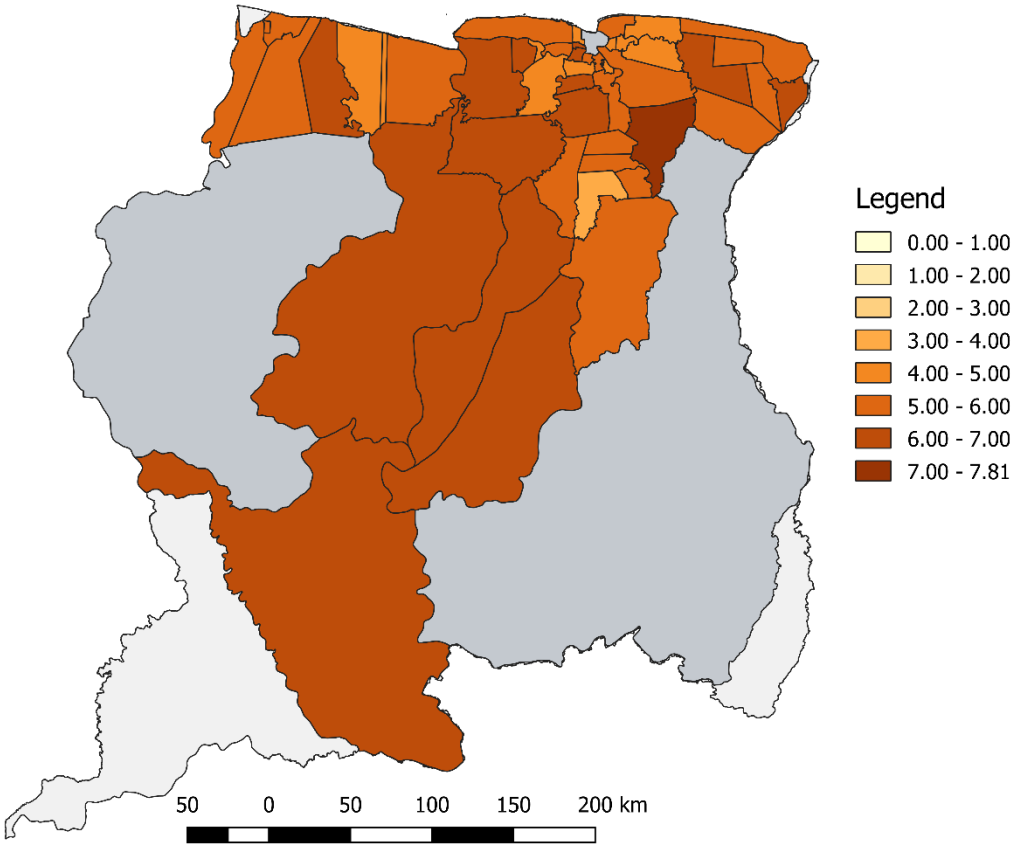
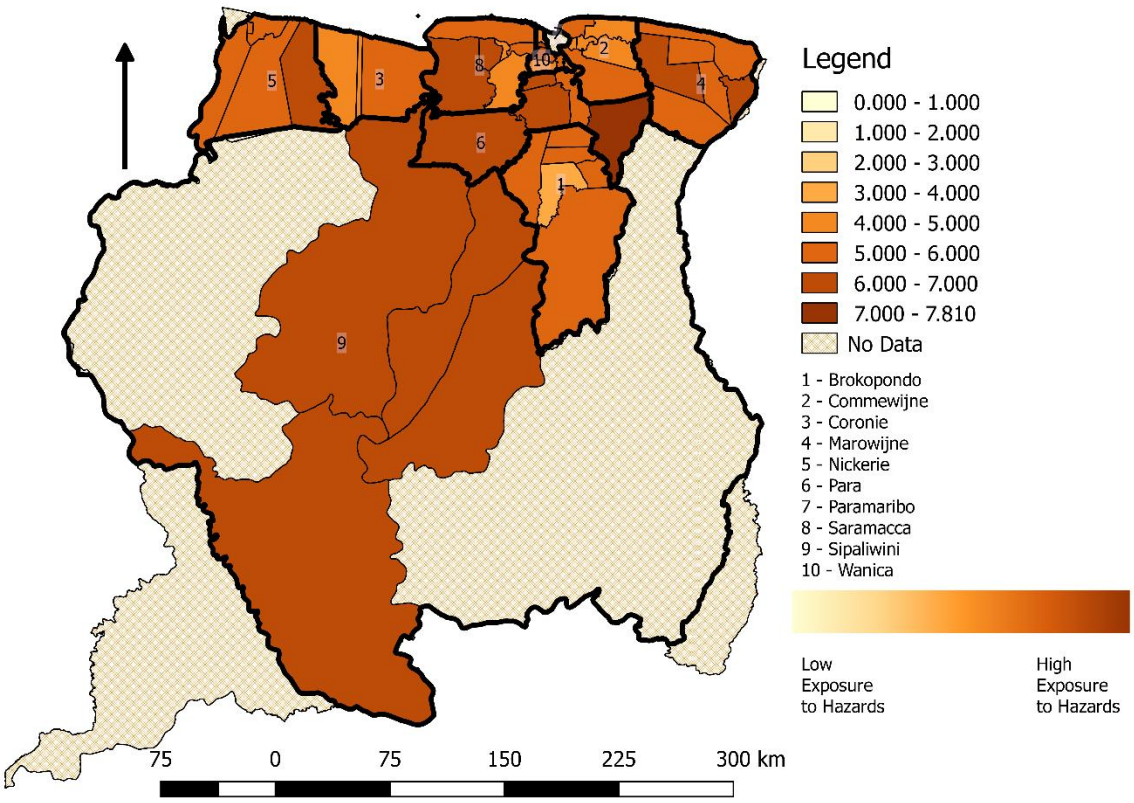
7.00 - 7.27
Districtsgrenzen
1 - Brokopondo
2 - Commewijne
3 - Coronie
4 - Marowijne
5 - Nickerie
6 - Para
7 - Paramaribo
8 - Saramacca
9 - Sipaliwini
10 - Wanica
Low Risk
High Risk
75 0 75 150 225 300 km

MAP OF SURINAME SHOWING DISTRICTS AND CORRESPONDING EXPOSURE TO HAZARDS INDICES

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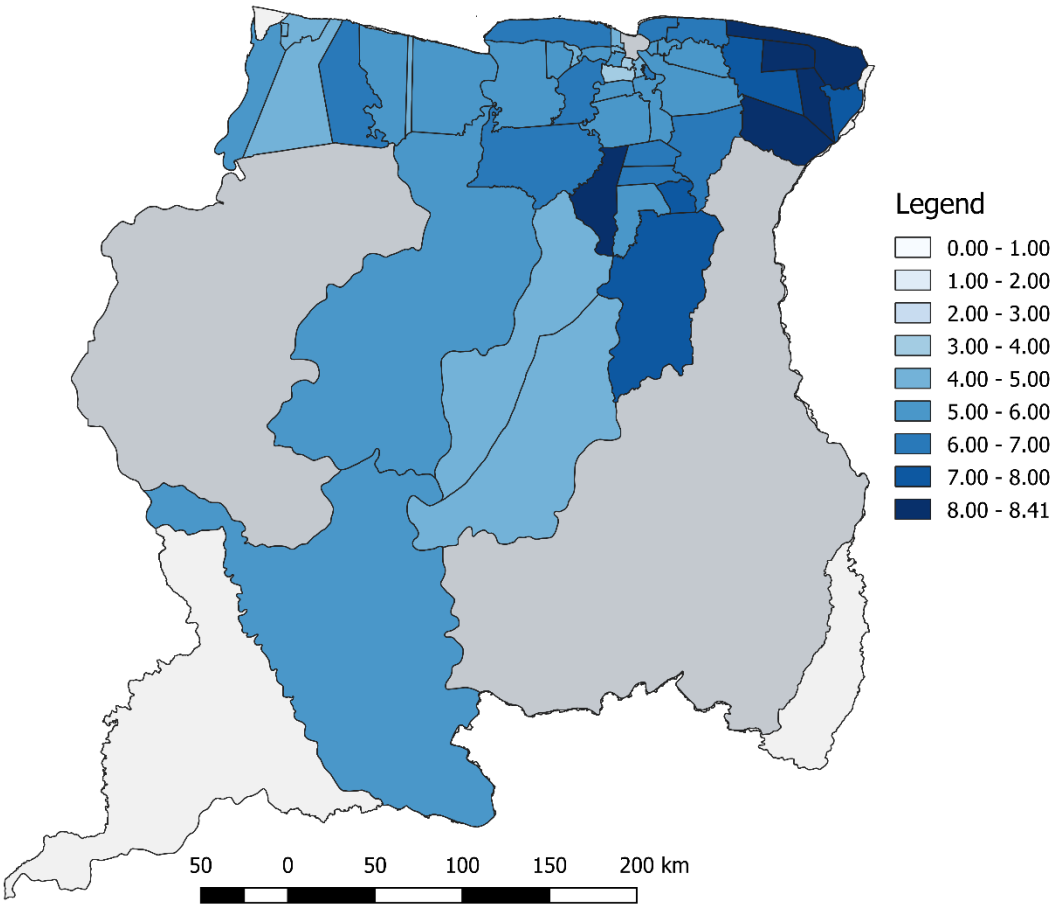
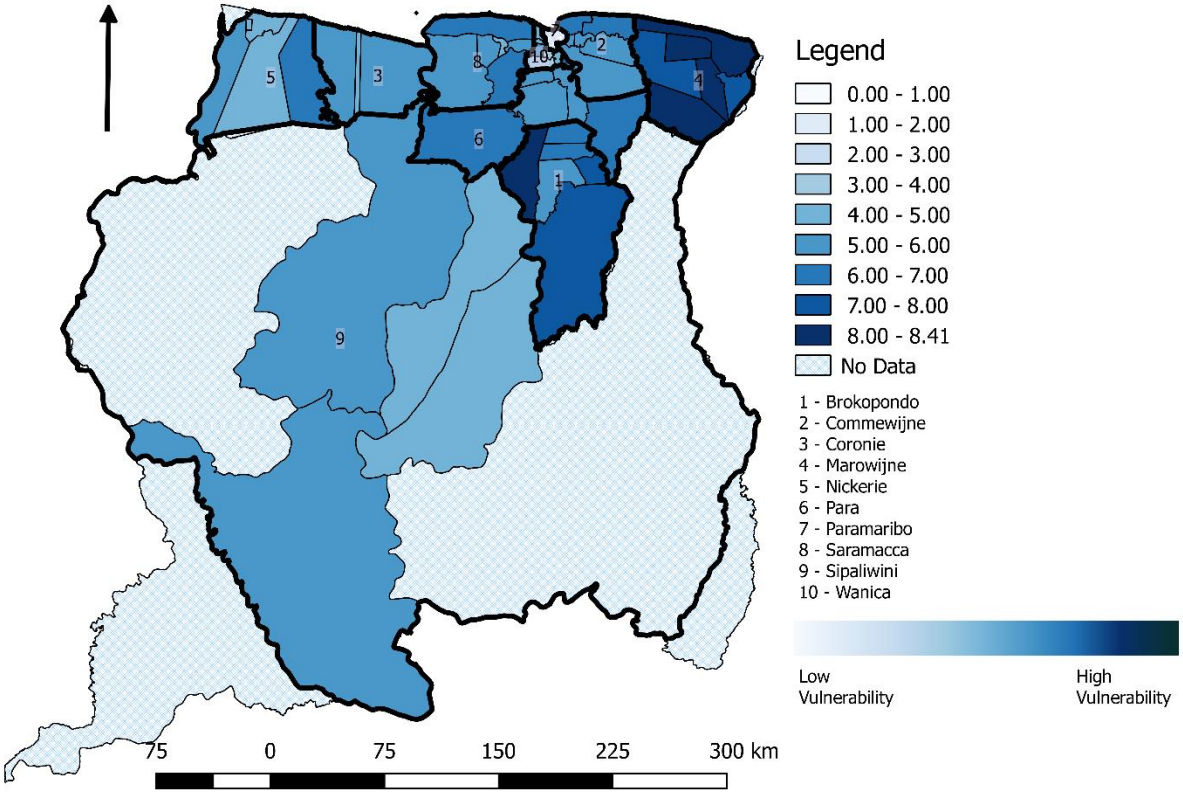
5.000 - 6.000
6.000 - 7.000
7.000 - 7.810
No Data
1 - Brokopondo
2 - Commewijne
3 - Coronie
4 - Marowijne
5 - Nickerie
6 - Para
7 - Paramaribo
8 - Saramacca
9 - Sipaliwini
10 - Wanica
Low Exposure to Hazards
High Exposure to Hazards
75 0 75 150 225 300 km

MAP OF SURINAME SHOWING DISTRICTS AND OVERALL VULNERABILITY INDICIES

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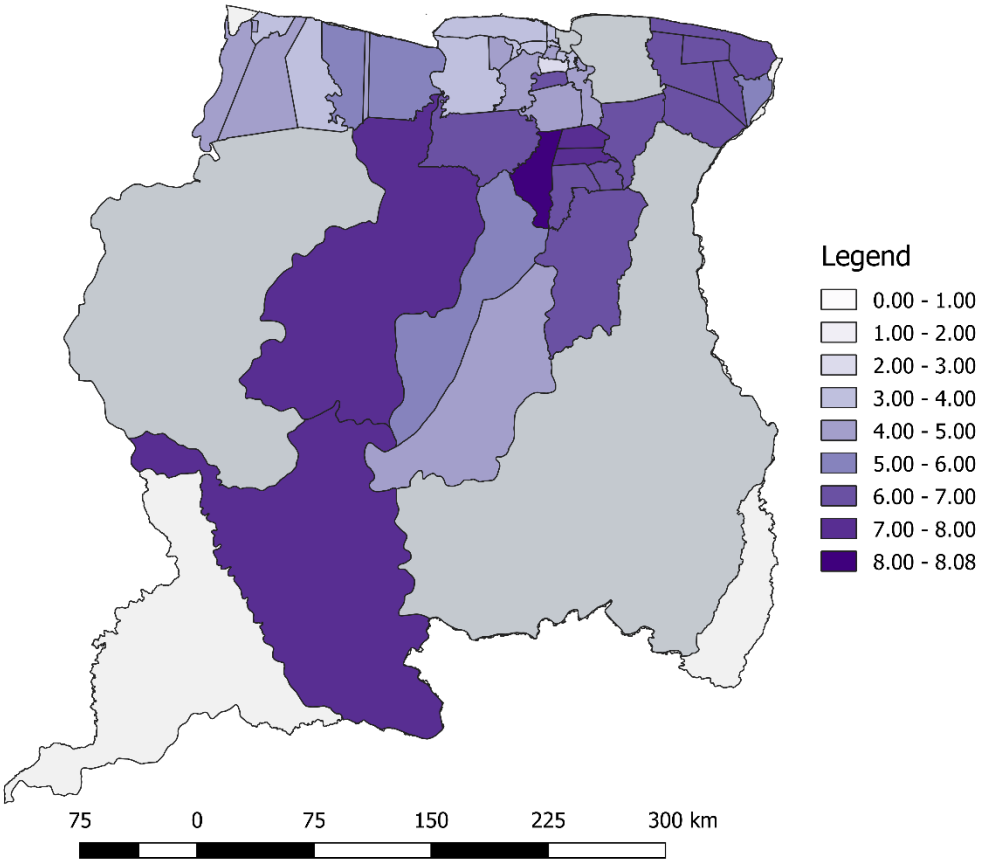
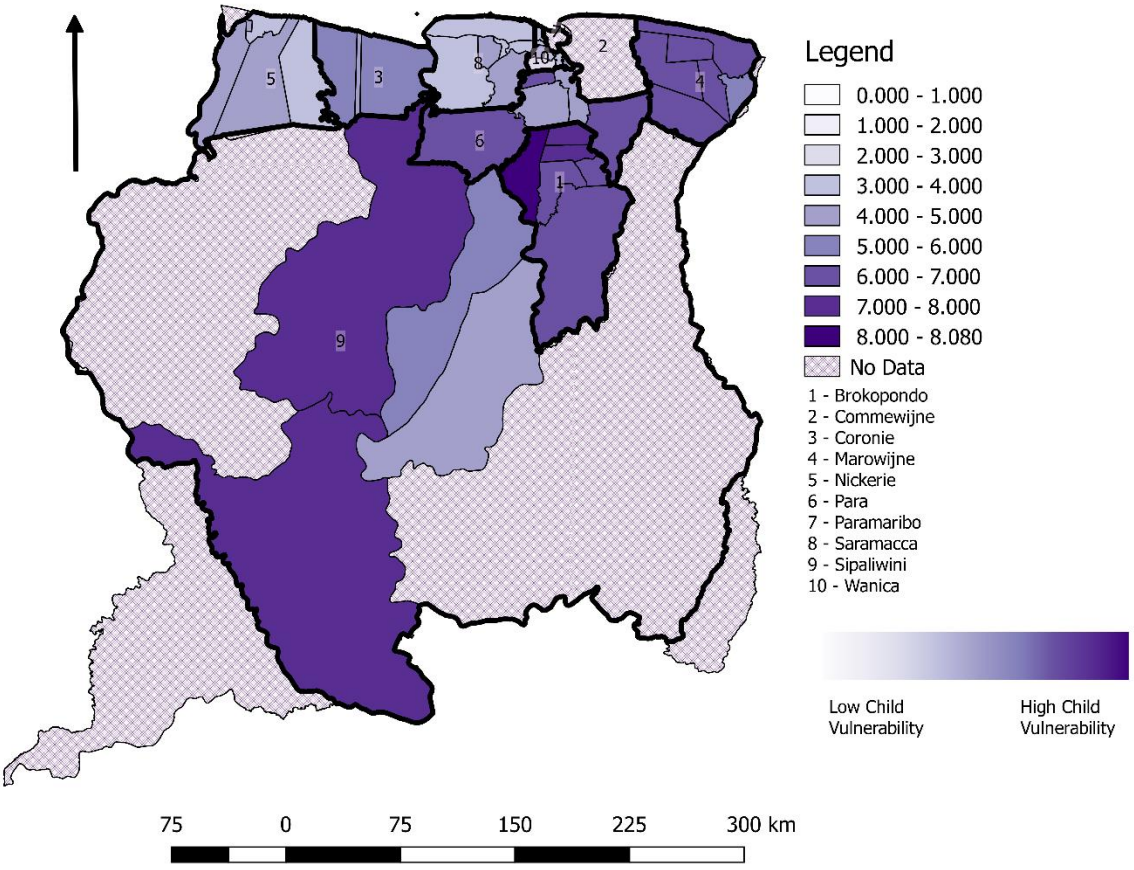
7.00 - 8.00
8.00 - 8.41
No Data
1 - Brokopondo
2 - Commewijne
3 - Coronie
4 - Marowijne
5 - Nickerie
6 - Para
7 - Paramaribo
8 - Saramacca
9 - Sipaliwini
10 - Wanica
Low Vulnerability
High Vulnerability
75 0 75 150 225 300 km

MAP OF SURINAME SHOWING DISTRICTS AND CORRESPONDING CHILD CENTRED VULNERABILITY INDICIES

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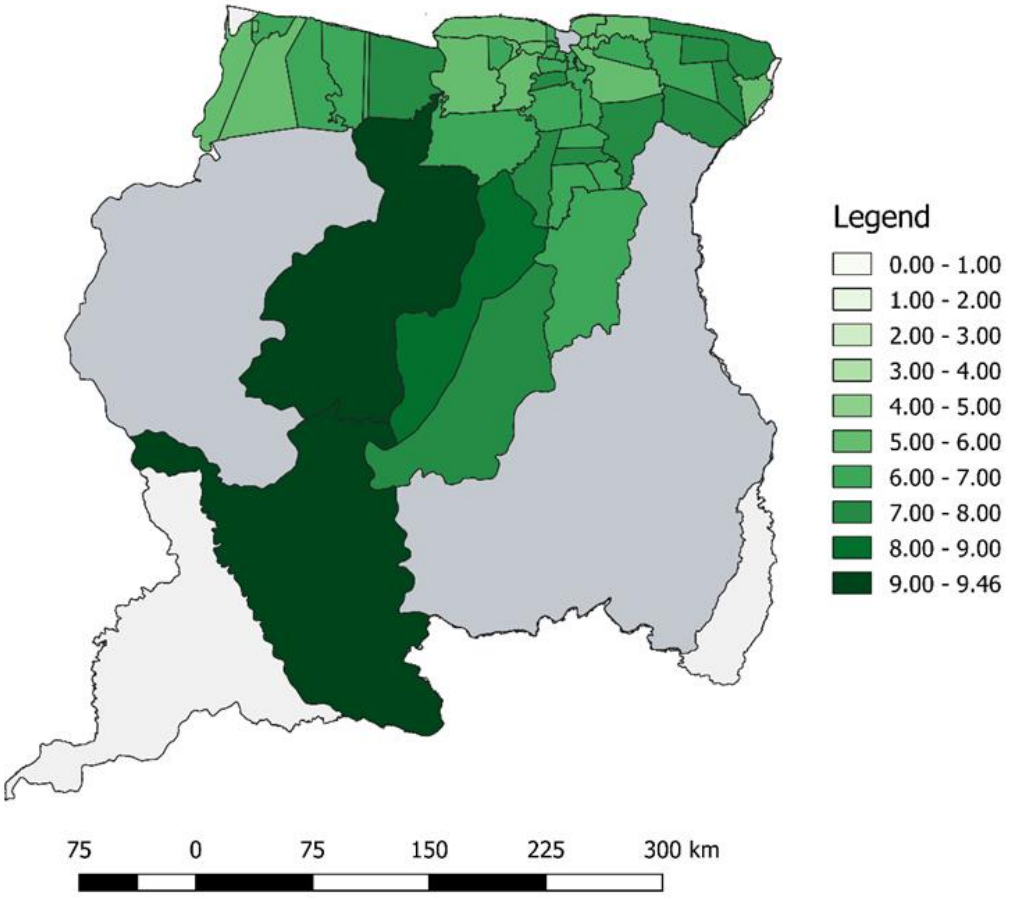
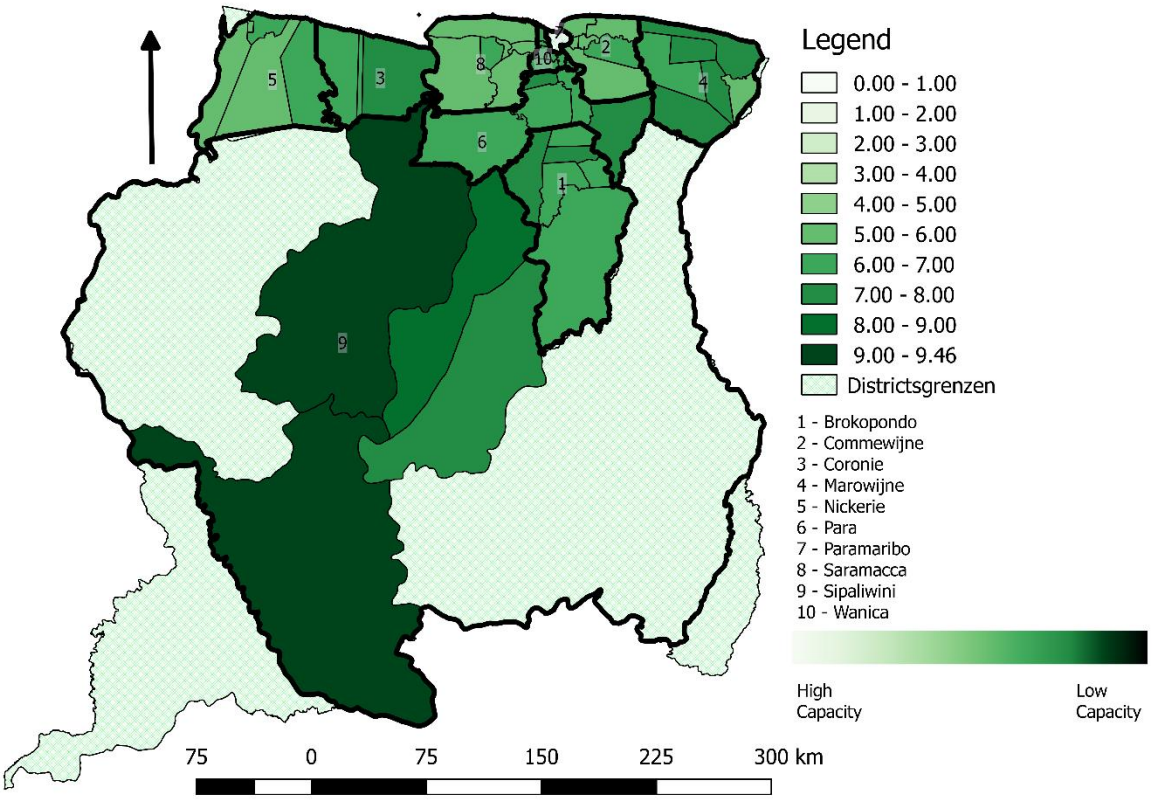
6.000 - 7.000
7.000 - 8.000
8.000 - 8.080
No Data
1 - Brokopondo
2 - Commewijne
3 - Coronie
4 - Marowijne
5 - Nickerie
6 - Para
7 - Paramaribo
8 - Saramacca
9 - Sipaliwini
10 - Wanica
Low Child Vulnerability
High Child Vulnerability
75 0 75 150 225 300 km

MAP OF SURINAME SHOWING DISTRICTS AND CORRESPONDING CAPACITY INDICIES

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4.00 - 5.00
5.00 - 6.00
6.00 - 7.00
7.00 - 8.00
8.00 - 9.00
9.00 - 9.46
Districtsgrenzen
1 - Brokopondo
2 - Commewijne
3 - Coronie
4 - Marowijne
5 - Nickerie
6 - Para
7 - Paramaribo
8 - Saramacca
9 - Sipaliwini
10 - Wanica
High Capacity
Low Capacity
75 0 75 150 225 300 km

Appendix 4

Report on the verification of findings of the Child-Inclusive Caribbean Community Risk Information Tool (CCRIT) in Suriname in the districts of Nickerie, Para and Wanica

Objective of verification

The purpose of the verification mission was to verify the results obtained in a previous application of the CCRIT methodology to the resorts in the districts of Nickerie, Para and Wanica. The verification session held aimed to engage representatives from the NCCR, the National Resilience Steering Committee, district representative and other stakeholders to check the results obtained against stakeholder expectations. This report documents the methodology of that verification process, as well as key outcomes of the verification mission. The scope of the verification session was limited to just the data collected in Para, Nickerie and Wanica.

Verification Methodology

7th May 2018

The action of verification was completed by conducting a verification mission to Suriname, as described in the Terms of Reference. This presented a few logistics hurdles. Due to cancellation of Suriname Airways flight PY730 on Saturday 5th May 2017, the consultant was unable to travel to Suriname on Sunday 6th May 2018. Therefore, the introductory meeting and the meeting with the members of the National Resilience Steering Committee had to be rescheduled. In the end, the introductory meeting with Colonel Slijngaard was not held, but the meeting with the steering committee members was facilitated through Skype at the prior agreed time.

During the meeting, the consultant gave a general overview of the CCRIT methodology and platform and presented findings from last year's application of the tool in the districts of Commewijne, Coronie, Saramacca, Para, Nickerie and Wanica. This presentation utilized a PowerPoint presentation that is attached to the end of this document as an appendix. Through risk maps, the findings portrayed a national overview of risks according to each of the following components: Overall Risk, Exposure to Hazards, Vulnerability, Child-Centered Vulnerability, and Capacity. Additionally, district and ressort level risks were displayed with detailed charts. Collectively, the results in the presentation provided a proxy for national averages in each risk component, by analyzing the risk scores within those districts.

Presenting these findings allowed stakeholders to question and challenge aspects of the results, thereby verifying those findings.

8th May 2018

After logistic hurdles were rectified, the consultant was able to set the verification session for Tuesday, 8th May 2018. The session was held in a large conference room at NCCR headquarters and began at 10am to allow representatives and commissioners from various districts to arrive. Twelve (12) individuals from a variety of organisations attended the meeting, offering the unique expertise.

The first presentation gave an overview of the CCRIT tool through a visual representation of the tool and its components, housed in the Microsoft Excel software package. Next, the second presentation repeated the presentation from the previous day to the national steering committee members. This was done to present an overview of the findings to members of the verification session group who were not present at the steering committee meeting the day before. The presentation succeeded in highlighting key areas for consideration in the tool, describing the expected data of the tool, and illustrating how data points impact ressort, district, and national scores.

Presentations were complete at 10:35am, giving way to the next phase of the verification session, which involved a group session involving all participants followed by smaller group sessions. In the first part of this phase, data collected for the ressort of Wageningen in Nickerie was verified to demonstrate the verification procedure to the group. Additionally, using that example accommodated the District Commissioner from the district of Nickerie, who was due to leave at 12pm.

Afterwards, representatives were broken up into groups according to the districts they represented and, to a lesser extent, the districts where they lived. Each group was tasked with verifying the results obtained from all ressorts within the particular district they had been assigned. This session lasted until 12:15pm, at which time we broke for lunch. After lunch, the group sessions continued.

9th May 2018

The activity slated for that day was a data gathering session in Marowijne district at the offices of the District Commissioner of Marowijne and his staff in Albina ressort. This activity lasted most of the day and concluded at 3:03pm.

10th May 2018

The activity slated for this day was a data gathering session held in the district of Brokopondo. This session took place in the Brokopondo Centrum ressort and involved members of the district committee and the district secretary. This session involved a total of seventeen persons who were split into three groups. Each group was tasked with completing data from the two ressorts and persons were assigned groups according to the ressorts which they represented and/or in which they lived.

11th May 2018

On the final day of the mission, data entry was conducted using the data collected during the two data gathering missions to Marowijne and Brokopondo. In addition, tentative maps were generated using the data collected. Finally, a meeting was held with Ms. Dulci Duurham and Colonel Slijngaard at the Coast Guard headquarters in Paramaribo in order to discuss the last week's mission and next steps.

Major Findings

During the group sessions of 8th May, various concerns and issues were raised by participants. These included ambiguity on parameter definitions, particularly those relating to the Exposure to Hazards component. Moreover, various observations were made by representatives, including that building codes were not tailored to build buildings that could withstand the various disasters experienced in Suriname and that certain questions could be answered by various government bodies who can provide objective data previously collected. These institutions include the Police Force, Ministries of Health, and Ministry of Education.

In completing the Exposure to Hazards section during verification, it was determined that ''severe storms'', ''intoxication'' and ''crime'' required precise definitions. In addition, the severity of potential hazards, in particular epidemic and plague, depends on the type of the epidemic and plague that manifests. Thus, using broad terms like epidemic obfuscated attributing severity to those hazards.

During the data gathering sessions of 10th May, various questions relating to healthcare and education, primarily in the Child Vulnerability section, could not be answered in that session as the committee members did not have possession of such information. These questions pertained to vaccination, breastfeeding, childhood education and out-of-school rate and healthcare. They were the same questions identified by the representatives in Marowijne, and these unanswered questions/ standards were earmarked for completion by representatives from the National Statistics Office, Ministry of Education and Ministry of National Security. Ultimately, the questions will be compiled into a word document for filling at a future date.

Additionally, general contamination of the water, soil and air was a major cause of concern for the representatives of Brokopondo. The issue of contamination was brought up numerous times, particularly in the hazard questionnaire, where the major concerns were the seepage of mercury into the water and soil and the release of particulate matter from dynamite and other explosions during the mining process. Representatives spoke of the effects witnessed by this contamination; such as numbness in the fingers, blurred visions and shaking limbs, and one representative is a victim of such symptoms after eating fish caught in local rivers. It was noted that although the CCRIT risk indexes for the ressorts in the district of Brokopondo were very low, the seriousness of the mercury contamination was not adequately uncovered by this process.

Appendix 5

Sample simplified data gathering tool: Brokopondo

Component	Indicators		Brokopondo					
			Brownsweg	Centrum	Klaaskreek	Kwakoegron	Marshallkreek	Sarakreek
	% of children not living with any biological parents	> 10%						
		5%-10%						
		1% -5%						
		1%						
		< 1%						
		> 10%						
Ecological	Existence of municipal land use policy or plan	Enforced or implemented						
		Enacted of endorsed						
		Draft document						
		No land use policy or plan						
Economic	% of persons employed	> 75%						
		50%						
		< 25%						
Functional	Existence of endorsed contingency plans	Endorsed plan						
		Draft plan						
		No plan						
	Access of capacity to access resources	Full access						
		Limited access						

		No access						
Non-Structural	Existence of laws and regulations (related to planning)	Enforced regulations						
		Enated law & regulations						
		Enacted law only						
		Draft law and regulations						
		No law and regulations						
	Existence of insurance for properties	> 25%						
		< 25%						
		None						
	Existence of insurance for livelihoods	> 25%						
		< 25%						
		None						
Structural	Number of access routes to municipality	More than 2 routes						
		Two routes						
		One route only						
		No access routes						
	Number of purpose built structures	More than two buildings						
		Two buildings						
		One building						
		None						
	% of households deemed structurally unsound	> 5%						
		< 5%						
		< 1%						
		None						
Social	Ratio of employed persons (women:men)	> 1:5						
		1:5						
		1:3						
		1:2						
		1:1						
	Existence of social safety nets	Accessible						
		Ad hoc arrangements						
		Do not exist						
	% of persons with secondary education	> = 50%						
		> 25%						
		> 10%						
		< 5%						
		0						

	Number of clinics at the local level	More than two clinics						
		Two clinics						
		One clinic						
		No clinic						
Health	% of women indicating that they did not breastfeed at all during one or more of their births	< 75%						
		< 50%						
		< 25%						
		< 5%						
	% of children not receiving the DPT vaccine in the first year of life	< 75%						
		< 50%						
		< 25%						
		< 5%						
	% of children aged 17 not up to date with vaccination	< 75%						
		< 50%						
		< 25%						
		< 5%						
	% of children receiving full immunization according to national schedule by age 24 months	< 75%						
		< 50%						
		< 25%						
		< 5%						
	adolescent birth rate							
	access to HIV/STD education	Integrated into curriculum						
		seasonal workshops						
		no access to HIV/STD education						
	access to contraception	readily available						
		restricted access						
		no access to contraception						
	number of children under 5 years at least three standard deviations from the mean	> 10%						
		5%-10%						
		1% -5%						

	weight for their age group (severe wasting)	1%						
		< 1%						
Water and Sanitation	% of households with access to potable water	> 50%						
		> 25%						
		>10%						
		< 5%						
		0						
	% of HH with basic sanitation facilities	> 75%						
		> 50%						
		>25%						
		>5%						
	Methods in place to dispose waste from sanitation facilities	Methods in place and being used						
		Methods in place, somewhat utilized						
		No methods in place, disposal techniques vary						
	% of households relying on rivers for main source of potable water	> 20%						
		10%-20%						
		1% -10%						
		1%						
		< 1%						
	% of HH with an available supply of drinking water within 30 mins round trip	> 75%						
		> 50%						
		>25%						
		>5%						
	Ratio of crime to local level	High						
		Medium						
		Low						
		Non-existent						
`Education	# of early childhood centres and nurseries	>3						
		3						
		2						
		1						
		None						
		>1						

	# of libraries and learning resource centres	1						
		None						
	Out of school rate for children aged 5-12 years	> 10%						
		5%-10%						
		1% -5%						
		1%						
		< 1%						
	Out of school rate for children aged 13-17 years	> 10%						
		5%-10%						
		1% -5%						
		1%						
		< 1%						
	Level of organization	Clearly documented & articulated roles						
		Ad hoc						
		Non existent						
	Legal Framework	Enshrined in law						
		In draft						
		Non existent						
	Level of awareness	Integrated into work plan						
		Hosted/participated in workshops						
		No knowledge of CDM						
	# of plans developed	More than 2						
		1 plan developed						
		No plans developed						
	% of budget for DM	More than 1 %						
		Less than 1 %						
		No budget						
	Accessible inventory in existence	Inventory accessible						
		Ad hoc inventory system						
		None exists						
	Dedicated equipment/tools	Tools identified & accessible						

		Ad hoc access to tools						
		No access to tools						
	Proportion of individuals with use of a mobile telephone	> 75%						
		≥ 50%						
		< 50%						
		< 25%						
	Proportion of HHs with access to internet	> 75%						
		≥ 50%						
		< 50%						
		< 25%						
	Proportion of HHs with electricity	> 75%						
		≥ 50%						
		< 50%						
		< 25%						
	Proportion of HHs with a radio	> 75%						
		≥ 50%						
		< 50%						
		< 25%						
	Proportion of HHs with a TV	> 75%						
		≥ 50%						
		< 50%						
		< 25%						
	# of persons trained in DM	> 1% trained						
		1% trained						
		0 trained						
	# of teams trained in DRM	> 2 Teams						
		2 Teams						
		1 Team						
		0 Teams						
	Comprehensive EWS	MHEWS exists						
		EWS exists for 2 hazards						
		EWS exists for 1 hazard						
		Ad hoc EWS exists						
		No EWS exists						

	Brokopondo Brownsweg																	
	Frequency						Scale						Severity					
	certain - occurs every year	occurs most years	occurs once or twice in 10 years	has occurred but a long time ago	has never occurred but could occur	NA	affects all the population	affects most of the population	affects less than half of the population	affects small groups of households	affects individual households	nothing affected	Catastrophic death, injury or public health; OR infrastructure destroyed; assets lost	Some deaths, injury or major public health problem; OR major damage; assets lost	Few deaths, some injury; OR moderate damage/losses	Minor injuries only; OR minor damage/losses	No impact on humans OR damage to infrastructure.	not applicable
Hurricanes																		
Floods																		
Droughts																		
Severe Storms																		
Extreme Temperatures																		
Hailstorms																		
Strong Winds																		
Earthquake																		
Landslides																		
Tsunamis																		
Volcanic																		

Eruptions																		
Explosions																		
HAZMAT Spills																		
Fires																		
Gas Leaks																		
Radioactive Emissions																		
Intoxication																		
Poisoning																		
Epidemics																		
Plagues																		
Air Pollution																		
Water Pollution																		
Soil Contamination																		
Extinction of Flora & Fauna Species																		
Civil Unrest																		
Crime / Homicidal Rates																		
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