Disaster Risk Reduction Country Document for SURINAME, 2014

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Message from government authorities

Reducing the risks that are associated with disasters is a crucial and literally life-saving aspect within the broad range of issues around disaster preparedness and management. That is why NCCR, the National Coordination Center for Disaster Management, embraces the old Surinamese saying of "*Dringi dresi wakti siki*"; take precautionary measures to prevent and be resilient against diseases! This report, the Country Document on Disaster Risk Reduction (DRR) is a key part of the efforts to indeed increase Suriname's preparedness and resilience against potential disasters. While we can be considered a "blessed country" which does not have a history of recurrent, devastating, natural or man-made disasters, that does definitely not mean that we should not be prepared and cautious of them. To the contrary, disaster risks are increasing exponentially, anywhere in the world, due to a variety of reasons. To name only a few of these reasons: increased urbanization and population density, expansion of technology, infrastructure and traffic, intensified use of chemicals and pollutants, faster river and coastal erosion, ecosystem degradation, and last but certainly not least: climate change that will threaten not only our current but also our future generations.

At the same time, knowledge and experiences on how to effectively prevent, mitigate or adapt to the new challenges is also increasing exponentially. Countries, and all actors concerned with disaster risk reduction, learn from each other and support each other. This report, the Suriname Country Document on DRR, is a fine example and tool for that. The report provides thorough insight and understanding of Suriname's status of preparedness, identifying and analyzing the full range of influencing factors including the legal, policy and institutional framework, vulnerabilities but also capacities for disaster risk reduction. Two districts, that to a large extend can stand model for Suriname's risks and risk reduction preparedness, have been analyzed in even more detail in order to show the actors, the processes and the actual risky circumstances or behavior in daily life. A number of key recommendations are also provided, guiding us towards priority action to be taken.

The process of reporting in itself has been a very useful one. The thorough and broad consultations that have been undertaken as part of the reporting process, provide important input and energy to our further DRR understanding and efforts. NCCR is therefore particularly grateful towards Ms. Maggie Schmeitz, the consultant who conscientiously prepared this report. We also sincerely thank all actors involved in the reporting for their valuable inputs, comments and recommendations.

Not only Suriname will learn from this analysis but also other countries in the Caribbean and Latin-American region where there are comparable circumstances and conditions. Similar reports have been made in other Caribbean countries, as part of the regional efforts for strengthening disaster risk reduction, supported by the Disaster Preparedness program of the Humanitarian Aid Department and Civil Protection of the European Commission (DIPECHO) and the United Nations Office for Disaster Risk Reduction (UNISDR). NCCR highly appreciates this support which is crucially necessary for us as a developing country with multiple challenges. The staff of UNISDR has been instrumental in realizing the reporting process.

Aware of its responsibilities, NCCR will seek to progressively implement the key recommendations coming forth from this report. In doing so, continued cooperation, knowledge sharing, mutual support and technical and financial assistance will be imperative. The energy and positive experiences rendered during the development of this report provides us with much confidence!

Paramaribo, November 2016

Col. Jerry Slijngard

Coordinator NCCR

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Introduction

The Country Document on Disaster Risk Reduction (DRR) was developed over the period September 2015 to July 2016 based on the interviews and documentation from numerous stakeholders in Suriname. Stakeholders included traditional authorities at community level, community-based organizations (CBOs) and intermediary non-governmental organizations (NGOs); and staff of Ministries at national and local level. Participants in the consultation workshop held on November 21, 2015 validated the findings from the field work, provided constructive feedback and committed themselves to gathering additional documentation.

The staff of the District Commissariats of the districts of Commewijne and Para and the National Coordination Center for Disaster Management provided support for the development of the document while significant logistical support was provided by Ms. D. Duurham, Secretary of the National Coordination Center for Disaster Management.

Purpose of the Document

The Country Document on Disaster Risk Reduction (DRR) is envisioned to become a national reference for policy design and decision making for interventions on DRR; as well as to provide guidance in the planning and coordination with cooperation entities striving to support Suriname on the way towards a more resilient and protected society.

The updating of the Suriname DRR Country Document is part of a regional project by the UN Office for Disaster Risk Reduction (UNISDR) within the framework of the DIPECHO Action Plan for the Caribbean 2013-2014. Suriname is one of the 7 Caribbean countries involved in the updating/preparing of Country Documents.

The DRR Country Document should contribute to the following goals:

1. Improving communication and dissemination of DIPECHO DRR tools and initiatives in the region;
2. Further advancing in the development of a common strategy towards DRR;
3. Contributions to the consultation process leading to the post-2015 framework for DRR.

The DRR focal point for Suriname, the National Coordination Center for Disaster Management (NCCR) indicated at the start of the process that for Suriname, it is not a simple task to identify vulnerable territories or populations. Taking into account the size of Suriname and the wide diversity across the urban coastal, the rural coastal and the rural interior, a national approach would not appropriately reflect the varying challenges. Therefore, it was agreed to select two districts (districts of Para and Commewijne) in order to analyse DRR at district and community level. The NCCR furthermore agreed to pilot the Criteria to Identify Key Actions for Disaster Risk Reduction (DRR) planning for these two districts. Recommendations from the previous draft (2012) of the DRR country document emphasized the need to include the priorities and needs of the most vulnerable population at the local level in future versions of the Country Document.

The district of Para is inland and has specific risk factors. Para houses mining industries, the international airport, and the main national drinking water source. Furthermore the population is an interesting mix of diverse communities, including isolated tribal communities. The district is partly rural with a rapidly urbanizing area.

The district of Commewijne is coastal and therefore faces different risks; there is flooding and coastal erosion. On the other hand, some challenges are quite similar. People living on the right river bank of the Commewijne River are isolated as well, being reachable by boat only. Since the construction of

the bridge that connects the district with the capital of Paramaribo, it has also seen urbanisation at a quickened pace.

Both districts therefore have risk factors that are specific, while others easily apply to other districts as well.

Methodology

The two main guide documents (the Standardized Country Document Format and the Criteria for Identifying Key Actions [CIKA]) were used in guiding the development of the document. Furthermore, the Draft Country Profile produced in 2012 was assessed on gaps and outdated information. Institutional and civil society stakeholders were identified from national, district and community levels relevant to the districts of Para and Commewijne. Information 'buried' within institutions and organizations was gathered and reviewed. A concerted effort was made to harmonise data from different stakeholders.

Interviews and assessments were prepared and conducted based on the questions from the CIKA as a guideline. Interview data was analysed to inform the draft Country Document. The draft document was shared with stakeholders in a national consultation workshop held on November 21, 2015 to gather feedback on the draft of the Country document. The document was revised in close cooperation with NCCR to produce the final document.

a) Inclusive approach to stakeholders

Recommendations from the previous draft [2012] emphasized the need to include the priorities and needs of the most vulnerable population at the local level in future versions of the Country Document. To be able to provide information, guidelines and priorities at all levels [national, district and community], the methodology focused on including the perspectives and priorities of the authorities and actors at district and community levels. Furthermore, civil society, including community-based organizations (CBO's) was specifically included, as it forms the informal fabric of society underneath the formal infrastructure.

b) Searching/compiling national data & statistics

Recommendations from the 2012 draft also suggests the need to search for and compile data and statistics generated and approved by national institutions, where necessary substituting the data in the 2012 draft (primarily obtained from external or tertiary sources). Data gathering was therefore undertaken from available secondary sources and directly sought from institutions and organizations.

Expected Outputs:

A widely supported Suriname DRR Country detailing:

1. Hazards and Exposure [documented, monitored, perceived];
2. Drivers of Risk [environmental degradation, land use, access to services, vulnerabilities];
3. Capacities for Risk Management [decentralization of DRM, resources and structures];
4. Enabling Regulations [legislation, coordination, mandate];
5. Trends and Future Prospects [link between risk trend analysis and development analysis].

1. Executive Summary

The updating of the Suriname Country Document on Disaster Risk Reduction (DRR) is part of a regional project by the UN Office for Disaster Risk Reduction (UNISDR) within the framework of the DIPECHO Action Plan for the Caribbean 2013-2014. Taking into account the size of Suriname and the huge diversity across the urban coastal, the rural coastal and the rural interior, the DRR focal point for Suriname, the National Coordination Center for Disaster Management (NCCR), chose to select two districts (Para and Commewijne) to analyse the status of DRR at district and community level; and to pilot the Criteria to Identify Key Actions for Disaster Risk Reduction (DRR) Planning.

International and Regional Context for Disaster Risk Reduction

The international context for DRR in Suriname is defined by global DRR global strategies such as the Hyogo Framework for Action (HFA) 2005–2015: Building the Resilience of Nations and Communities to Disasters. It is also defined by a growing awareness that the current global development paths lead dangerously into the boundaries of resilience of our planet, with corresponding impacts on Suriname. Suriname is party to major environmental conventions, among others the UN Framework Convention on Climate Change (UNFCCC) and the UN Convention on Biological Diversity (CBD). Suriname is currently discussing ratification of the Minamata Convention, a global treaty to protect human health and the environment from the adverse effects of mercury (opened for signature on 10 October 2013).

As a member of, among others, the Caribbean Community (CARICOM), of the Small Island Developing States (SIDS), of the Caribbean Disaster and Emergency Management Agency (CDEMA), of the Organization of American States (OAS) and of the Union de las Naciones Suramericanas (UNASUR), Suriname participates in regional strategies for Comprehensive Disaster Management (CDM) and building resilience to Climate Change.

Legislative, Normative and Institutional Framework for Disaster Risk Reduction (DRR)

The Constitution of Suriname has no specific provisions for disasters, but it mandates the President to declare the state of emergency to maintain external and domestic security in case of danger or threat; in any part of Suriname, subject to previous consent of the National Assembly (Art. 102 paragraph 3).

The Act on Regional Bodies gives the District Commissioner (DC) a specific mandate to demand the use of buildings and vehicles, and demand the assistance of capable residents in case of disasters and calamities in the district; enforced by the police if needed (Art. 49 paragraphs 1 and 2). The DC is in charge of the Police and the Fire Department in his/her district and has extensive local regulatory and administrative powers.

The National Coordination Centre for Disaster Management (NCCR) became active in 2006 and was appointed as the Coordinating Institute for the Caribbean Disaster Emergency Management Agency [CDEMA] in 2012. Since 2014 the NCCR has been institutionally moved from the Ministry of Defense to the Cabinet of the President.

The draft Disaster Management Legislation and the Law providing NCCR a legal base have not been approved as yet. Other main legislative gaps identified in the context of DRR are the absence of National Environmental Legislation (the existing draft has yet to be discussed and approved) and the Planning Enactment (*Planverordening*) which needs to be operationalized.

The cohesion between different Plans (often responding to different international commitments) should be improved. As climate change has a clear impact on biodiversity, the National Biodiversity Action Plan (NBAP) 2012-2016 should be better linked up with the National Climate Change Action Plan (NCCAP) which has a focus on adaptation and mitigation. Furthermore, a National Road Safety Plan and a National Health Disaster Plan have been developed but it is not clear how operational they are currently.

NCCR works most closely with 5 selected Ministries who each have a designated Disaster Coordinator. NCCR has adapted the Incident Command System (ICS) as the strategy that best suits our reality: Based on the size of Suriname and the huge variety in population density, NCCR strives to enable the population at district and community level to be First Responders. In the envisioned structure, the District Commissioner is the Head of the Disaster Committee in the district, and central in the response network.

NCCR does not have an overview of all plans related to safety and security of people and their environment. According to NCCR, the Bureau for National Security (BNV) should focus on making broad policy, and produce an overall National Strategic Safety Plan, while NCCR concentrates on preparedness, concept legislation, response coordination and early recovery. Producing the National Disaster Response Plan would be a part of this.

In 2011 Suriname engaged with the Inter-American Development Bank (IDB) in a project "Support for improving integrated disaster risk management for climate-resilient development". NCCR indicated in December 2014 that, due to shortage of financial resources and staff, implementation of mainstreaming suggestions forthcoming from this project had not yet taken place.

Observations within the NCCR coordination center seemed to indicate a severe shortage of staff (currently a total of 5-6 people), especially on a higher level of decision-making (2-3). Also it seemed as though the available NCCR staff was very much involved in implementation, leaving less time for planning and coordination. It is recommended to evaluate the staffing of NCCR compared to the tasks and responsibilities of the Center.

According to NCCR each District Commissioner has the responsibility to develop a Disaster Response Plan for the District. The Disaster Response Plans from all the districts will then make up the National Disaster Response Plan for Suriname.

The State of Disaster Risk in the Country

The documented (natural) disaster history of Suriname is defined by localized flooding (1969, 2006 and 2008). NCCR and the Suriname Red Cross (SRK) use slightly different definition. Officially, the criteria to record disaster information on the international databank EM-DAT (10 or more people reported killed; 100 people reported affected; a call for international assistance; declaration of a state of emergency) are adhered to in order to define disasters for Suriname. In practice, both NCCR and SRK treat smaller or localized calamities or emergencies in the same way as disasters; for example, the damage done by severe winds in recent years.

Awareness of disaster risk, and thus awareness of the need to reduce this risk, is lacking on all levels of society. This seems to be caused by two misconceptions: 1) the definition of a disaster "to exceed the ability of the affected community or society to cope using its own resources" is translated to national capacities; while events are often localized and therefore need an assessment of the local capacities. 2) Conception is of natural disasters of which we have a history only in the interior: people in the urban districts do not feel this affects them; also policy makers tend to think we do not have disasters *("We are a blessed country without disasters").*

Disaster Risk for the districts of Commewijne and Para

NCCR selected the inland district of Para (with mining industries, the international airport, and the main national drinking-water source); and the coastal district of Commewijne (experiencing flooding and coastal erosion). Both districts are partly rural, have isolated communities, and experience urbanization and population growth at a quickened pace. Some hazards and risks are identified distinctly for one district, but as **Error! Reference source not found.**Table 1 shows, some are shared. It is important to note that most of the drivers for risk for both districts are manmade, or at least partly manmade. For example, severe winds have increased in occurrence; but the clearing of mangrove and

trees, and the lack of stormproof construction greatly contribute to the damage and impact of the event.

Table 1. Hazards/Risks identified in the Districts of Commewijne and Para			
	Hazards/Risks Commewijne	Joint Hazards/Risks	Hazards/Risks Para
1	Flooding from sea	Riverbank erosion	-
2	Coastal erosion	Road Safety: Transport of dangerous goods and heavy loads	Road Safety (main road without lanes for bicycles or pedestrians)
3	Salination of soil and water	Inundation	Villages (and new concessions) under the flight routes of JAPI Airport
4	Severe winds	-	Mass storage of aviation fuel close to traffic.
5	Scarcity of freshwater	Droughts / quality of drinking water	Sanitation not meeting safety criteria
6	Storage of chemical waste	Use of pesticides	Contamination of soil and groundwater by Ornamibo landfill (Wanica)
7	Processing of medical waste	Climate change: temperature rising	Deforestation by (illegal) wood logging and for mining and construction purposes
8	-	Climate Change: sea level rising	Mercury poisoning by artisan gold mining / **all** mining without mercury emission control
9	-	Emergencies affecting Public Health and Safety	(violent) conflicts over land use/rights
10	-	-	safety of former mining area for re-use

Vulnerabilities

Small farmers and fishermen in Commewijne are extra vulnerable to risks such as flooding, salination and fresh water scarcity. The small-scale losses that occur frequently are not registered, and would not be considered a disaster by definition. Cumulatively however, frequent small-scale losses do impact the sustainability of livelihoods considerably. Small farmers in Para share this vulnerability with their peers in Commewijne. Respondents remark on unemployed youth willing to plant but not having the financial reserve to wait for harvest time. Apart from the investment in time, the dependence on climate and the possible occurrence of inundation makes agriculture a high-risk investment in the perception of youth, as compared to the quick gain of small-scale gold mining, for example. With regard to the most remote Indigenous communities, the floods of 2006 and 2008 had a long-term effect on the food security of villages. Both national and international reports have mentioned the enormous impact of the losses because of the small and self-sufficient nature of agriculture: people have no alternatives. Emergency assistance was short-term and did not cover the period for new

crops to grow. Not much has been done to enhance the resilience of communities for future emergencies.

Emergency services are limited to the administrative 'center' of the district; most remote villages are still difficult to reach. Furthermore, the lack of communication and warning systems emphasize the vulnerability of remote communities.

Health workers in primary healthcare are in general not sufficiently trained for emergency response, nor are facilities equipped. The presence of Environmental Inspectors in the field is found lacking by both communities and local government. Like other services responsible for monitoring and controlling, the Department of Environmental Inspection is struggling with financial constraints, personnel not adequately trained, a centralized approach, and no structural linkages with technical expertise, such as certified labs and scientists.

Awareness about a possible disaster is lacking on all levels, impacting the choices made in spatial planning: for example placing of a nursing home and a senior citizen home (with residents not or limitedly mobile) in a probable/future danger zone, very close to the river (Commewijne). Awareness about manmade drivers of risk is even less. The first recommendation therefore is about ***Awareness raising on disaster risk reduction with a strong focus on the social construction of risk on all levels***; with a priority for a) members of Parliament in charge of national legislation; and b) local and traditional authorities in charge of local legislation and enforcement of the (traditional) rules [District Commissioner and staff; Tribal and Indigenous Chiefs and cadre; Plantation Administrations].

A total of 22 recommendations relate to strengthening local capacity for data-collection; key legislation for DRR, environment, planning and spatial planning; strengthening the capacities of NCCR, and for legal roles of the Traditional Authorities of Indigenous and Tribal Peoples. To curb mercury emission, it is recommended to ratify the Minamata Treaty and to follow its guidelines urgently; criteria for safe drinking water, sanitation and housing should apply in the districts as in the city; information on this should be shared through local authorities and health workers; existing plans relevant to health, safety and environment should be updated, made coherent and effectively implemented; and the National Strategic Safety Plan should be made and include a DRR Plan based on risk as a social construction. DRR should be included in all decentralized planning, from village to ressort to district level, to feed into the National DRR plan. Capacity for response should be increased and decentralized in the same way, utilizing advanced (ICT) communication structures set up by DLGP.

Finally, DRR should be mainstreamed into all future consultations, studies and plans in the sustainable development context, making use of the momentum around the Post 2015 Sustainable Development Goals; and DRR awareness should be mainstreamed in all awareness raising (education, media) and advocacy (decision makers in both public and private sector) towards sustainable development.

2. List of acronyms

AdeKUS	Anton de Kom University of Suriname
AOSIS	Alliance of Small Island States
ARI	Acute Respiratory Infections
ATM	Ministry of Labour, Technological Development and Environment
CAREC	Caribbean Epidemiology Centre
CARICOM	Caribbean Community
CCCCC	Caribbean Community Climate Change Centre
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Clean Development Mechanism (in the context of energy and emissions)
CDM	Comprehensive Disaster Management
CEHI	Caribbean Environmental Health Institute
CELOS	Center for Agricultural Research
CMO	Center for Environmental Research [AdeKUS]
CSNR	Central Suriname Nature Reserve
CTO	Caribbean Tourism Organization
DANA	Damage and Needs Assessment
DJF	Seasonal period including December, January, February
DLGP	Decentralization and Local Government Strengthening Program
DMC	Disaster Management Committee
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EbA	Ecosystem-based Adaptation
EBS	Energy Company Suriname
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EIA	Environmental Impact Assessment
ENSO	El Niño Southern Oscillation
ETS	Emission Trading Scheme (European Union)
EU	European Union
EWS	Early Warning System
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product

GHG	Greenhouse gas
GOS	Government of Suriname
HFA	Hyogo Framework for Action
IATA	International Air Transport Association
ICC	International Code Council
ICOADS	International Comprehensive Ocean Atmosphere Data Set
ICZM	Integrated Coastal Zone Management
IDB	Inter- American Development Bank
IEA	International Energy Agency
IFRC	International Federation of Red Cross
IICA	Inter-American Institute for Cooperation on Agriculture
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ISCCP	International Satellite Cloud Climatology Project
ISDR	International Strategy for Disaster Reduction
ITCZ	Inter-Tropical Convergence Zone
ITTA	International Tropical Timber Agreement
IUCN	International Union for Conservation of Nature
IWCAM	Integrated Watershed and Coastal Areas Management
IWRM	Integrated Water Resources Management
IVM	Integrated Vector Management
JJA	Seasonal period including June, July, August
LBB	Suriname Forest Service
MAM	Seasonal period including March, April, May
MDGs	Millennium Development Goals
MUMA	Multi-use Management Area
NARENA	Natural & Environment Assessment Department
NBS	National Biodiversity Strategy
NCAP/NCAP-2	Netherlands Country Assistance Program, Phase 2
NCCAP	National Climate Change Action Plan
NFP	National Forest Policy
NCCR	National Coordination Centre for Disaster Management

NGOs	Non-Governmental Organisations
NH	Ministry of Natural Resources
NIMOS	National Institute for Environment and Development in Suriname
NZCS	National Zoological Collection of Suriname
OECD	Organisation for Economic Co-Operation & Development
PAHO	Pan-American Health Organization
POPs	Persistent Organic Pollutants
RCM	Regional Climate Model
REDD	Reducing Emissions from Deforestation and Forest Degradation
ROGB	Ministry of Spatial Planning, Land and Forest Management
RPP	Readiness Preparation Proposal
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SLR	Sea Level Rise
SON	Seasonal period including September, October November
SRK	Red Cross Suriname
STF	Suriname Tourism Foundation
STINASU	Foundation for Nature Conservation in Suriname
STZC	Sustainable Tourism Zone of the Caribbean
SWM	Suriname Water Company – Surinaamse Waterleiding Maatschappij
SWRIS	Suriname Water Resources Information System
TCA	Tratado de Cooperacion Amazonica
TCT	(Ministry of Transport, Communication and Tourism
UNASUR	Union de las Naciones Suramericanas
UNCCDD	United Nations Convention to Combat Desertification & Land Degradation
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific & Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change

3. INTERNATIONAL AND REGIONAL CONTEXT FOR DISASTER RISK REDUCTION

3.1 Global DRR and Sustainable Development Strategies

The international context for Disaster Risk Reduction (DRR) in Suriname is defined by the global DRR global strategies and platforms such as the Yokohama Strategy and Plan of Action for a Safer World, and The Hyogo Framework for Action (HFA) 2005–2015: Building the Resilience of Nations and Communities to Disasters[1]. In particular, the HFA is the reference framework for DRR public policy. The international and regional context for DRR is also defined by a growing awareness that our global present development path leads us into the boundaries of the planet. In his lobby for sustainable development Jeffrey D. Sachs summarizes the threat as follows:

> *"All of our civilization (the location of our cities, the crops we grow, and the technologies that run our industry) is based on a climate pattern that will soon disappear from the planet. The Earth will become much warmer than it has been during the entire period of civilization; the sea level will become much higher; the crops that feed humanity will suffer many devastating harvest failures as a result of high temperatures, new kinds of pests, droughts, floods, losses of biodiversity (such as pollinating species), and other calamities."[*Sachs, 2014; 51]

The Johannesburg World Summit on Sustainable Development in 2002 (Rio+10) was the third conference held by the United Nations on the relationship between economic development and environmental protection. The first, in Stockholm in 1972, performed the service of bringing the subject to international attention. The second, in Rio de Janeiro in 1992, adopted Agenda 21, an ambitious manifesto for social equity and higher living standards in the developing world. Rio's most notable products however were the treaties to address global warming and the loss of biodiversity.

The Johannesburg Declaration showed a shift in the top priorities in sustainable development: from the global threats that developed countries identified late in the last century to the national needs of the developing countries themselves. At the previous world environment conference, the main focus was on climate change and the loss of biodiversity. At the most recent conference, the focus was on the provision of safe drinking water to the 1.1 billion people who lack it, safe sanitation to the 2.4 billion people who lack it, adequate nutrition for the 815 million people who lack it, and basic health care and education that richer countries of the world take for granted (Anderson, 2003).

The fourth United Nations Conference on Sustainable Development (UNCSD) that took place in Brazil on 20-22 June 2012 (Rio+20) focused on two themes: (a) a green economy in the context of sustainable development and poverty eradication; and (b) the institutional framework for sustainable development. Seven priority areas were identified: 1) decent jobs, 2) energy, 3) sustainable cities, 4) food security & sustainable agriculture, 5) water, 6) oceans and 7) disaster readiness (UNDESA 2012).

Examining the Rio+20's outcome, development specialists agreed that, while the Conference did not produce any breakthrough agreements or commitments, it did provide an international platform to shed light on pressing issues in the quest to secure global sustainable development. The Conference succeeded in making global sustainable development goals a priority on the international agenda; in shifting the focus of the "green economy" agenda to the national and domestic level (where concrete goals and actions can be more readily formulated); and in tangible financial commitments for sustainable development goals. Specialists interpreted the lack of a clearly defined path to a "green economy" as allowing developing countries "critical national policy space" to formulate their own

[1] http://www.unisdr.org/hfa

paths, while also discussing developed countries' willingness to undertake responsibilities for committing to a sustainable global future (CFR, 2012).

The consequences of climate change (such as sea level rise) are mainly caused by the rising concentration of CO_2 in the atmosphere, as a result of humanity's massive use of coal, oil, and natural gas (fossil fuels). The world community is slow to acknowledge that the development path needs to change from industrialization (called the Business As Usual or BAU trajectory) towards sustainable development: a holistic approach linking good governed economic development, social inclusion, and environmental sustainability. Sustainable development demands a dramatic change of course, one in which the world quickly adopts new technologies (renewable energy) and innovative economies.

The Millennium Declaration (2000) and the Millennium Development Goals (2000-2015) have been the driving force behind development aid and development agendas worldwide. The world is now preparing for the Sustainable Development Goals to lead us beyond 2015.

Suriname ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1997. In 2005 Suriname submitted its Initial National Communication to the UNFCCC, followed by the second National Communication in February 2013. Suriname is also party to the UN Convention on Biological Diversity (CBD).

Suriname is a partner country of UN-REDD[2] and has successfully developed a Readiness Preparation Proposal within the ambit of the Forest Carbon Partnership Facility (FCPF). REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. REDD+ readiness relates to the efforts a country is undertaking, with the support of multilateral or bilateral initiatives, to build its capacity to be ready for a REDD+ mechanism. On 21st March 2013 the Suriname Readiness Preparation Proposal (R-PP) was approved by the World Bank in Washington DC during the PC14[3].

Suriname is a member state of the World Health Organization (WHO) and as such striving towards adherence with the International Health Regulations (IHR) which came into force in 2007.

Suriname is also a member state of the International Maritime Organization (IMO)[4] and as such striving for full compliance with the International Convention on Standards of Training, Certification and Watch-keeping for Seafarers or STCW Code[5].

Suriname took major steps towards handling chemical hazards by approving the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal on February 15, 2011. The State has ratified the Stockholm Convention and acceded[6] the Basel Convention that same year on September 20, 2011. (ATM 2011; Updated National Chemical Profile 2011)

The National Institute for Environment and Development Suriname (NIMOS) initiated discussion on signing the Minamata Convention on Mercury, with a seminar in March 2013. On April 6, 2014 NIMOS

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[2] UN REDD: The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

[3] TOR for experts to support the transition project towards implementation of the R-PP (February 2014)

[4] IMO is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships

[5] Adoption: 7 July 1978; Entry into force: 28 April 1984; Major revisions in 1995 and 2010

[6] Accession is defined as the act whereby a State and/or regional economic integration organization accepts the opportunity to become a Party to the Convention after it entered into force. It has the same legal effect as ratification.(website Basel Convention)

presented a roadmap to guide informed decision-making on ratification of the Minamata Convention.[7] The Minamata Convention, a global treaty to protect human health and the environment from the adverse effects of mercury, was adopted and opened for signature on 10 October 2013. According to the Minamata website[8], at the time this report is written Suriname is the only State in South America who is not a signatory as yet. The major highlights of the Convention include a ban on new mercury mines, the phase-out of existing ones, control measures on air emissions, and the international regulation of the informal sector for artisanal and small-scale gold mining.[9] Neighboring State Guyana recently ratified the Minamata Treaty on September 24, 2014.

3.2 Regional DRR and Sustainable Development Strategies

The Caribbean Community (CARICOM) adopted in 2001 a Strategy and Results Framework for Comprehensive Disaster Management (CDM) in the region, led by the Caribbean Disaster Emergency Management Agency (CDEMA). The revised and enhanced Framework (2007-2012)[10] places stronger emphasis on disaster loss reduction through risk management. The Regional Framework for Achieving Development Resilient to Climate Change (2009-2014) also establishes the direction for the continued building of resilience to the impacts of GCC by CARICOM states. The NCCR is a member of CDEMA and is collaborating with this agency for the development of the Comprehensive Disaster Management System. This regional organization, specialized in disaster management, supports the activities of the NCCR with technical assistance, knowledge (training) and expertise.

Although Suriname geographically is not a small island state, based on similar development challenges it has joined the ranks of the Small Island Developing States (SIDS). As such, Suriname has committed to the implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (BPoA)[11]. Suriname also committed to the Mauritius Strategy for the Further Implementation of the Barbados Programme of Action for the Sustainable Development of SIDS in 2005 and the 5-year review of the Mauritius Strategy (MSI) in 2010[12]. The Outcome Document of the Third International Conference of Small Island Developing States in Samoa (1 - 4 September 2014) is the S.A.M.O.A (SIDS Accelerated Modalities of Action) Pathway. The Samoa Pathway recognizes the adverse impacts of climate change and sea-level rise on SIDS' efforts to achieve sustainable development as well as to their survival and viability, and addresses economic development, food security, disaster risk reduction (DRR) and ocean management, among other issues.

In April 2014 NIMOS hosted the annual Caribbean National Ozone Officers Network meeting to discuss implementation of the Montreal Protocol to ban Ozone Depleting Substances (ODS) in the Caribbean[13]. Suriname acceded the Vienna Convention and the Montreal Protocol on October 14, 1997; the State also acceded to the London, Copenhagen, Montreal and Beijing Amendment on March

[7] Dagblad Suriname, presentation by Acting Director of NIMOS Mr.Cedric Nelom
[8] On December 20, there were 128 signatories and 9 ratifications
http://www.mercuryconvention.org/Countries/tabid /3428
[9] Minamata Convention website
[10] http://www.cdema.org/publications/CDMFramewkInfoSheet.pdf
[11] The BPoA sets forth specific actions and measures to be taken at national, regional and international level
[12] High-level segment of the 65th Session of the UN General Assembly (2010), pursuant to UN General Assembly Resolutions 63/213 and 64/199.
[13] NIMOS website 2014

29, 2006. Suriname is operating under Article 5 paragraph 1 of the Montreal Protocol (considered as developing countries).[14]

On November 24 of 2010 the Republic of Suriname ratified the founding Treaty of the Union de las Naciones Suramericanas (UNASUR)[15]. In this context Suriname participates in all activities of the UNASUR Defense Council, including disaster management. Suriname is also a member of the high-level working group on comprehensive disaster risk management, and contributes to a collective Post-2015 Strategy for Disaster Management (NCCR, 2014)

[14] Website Montreal Protocol

[15] http://www.gov.sr/sr/ministerie-van-buza/over-buza/departementen/onderdirectoraat-regionale-integratie/unasur.aspx

4. NATIONAL CONTEXT

4.1 Physical Environment

4.1.1 Geographic Location

The Republic of Suriname is located on the Northeastern coast of the South American continent between 2°-6° North latitude and 54°-58° West longitude (**Error! Not a valid bookmark self-reference.**). It borders in the north with the Atlantic Ocean, in the south with Brazil, in the east with French Guyana and in the west with Guyana. These borders are historically established in the east and the west by the rivers Marowijne and Corantijn respectively, and in the south by the watershed between the Amazonian basin and the basins of the Suriname Rivers. (NIMOS, 2005)

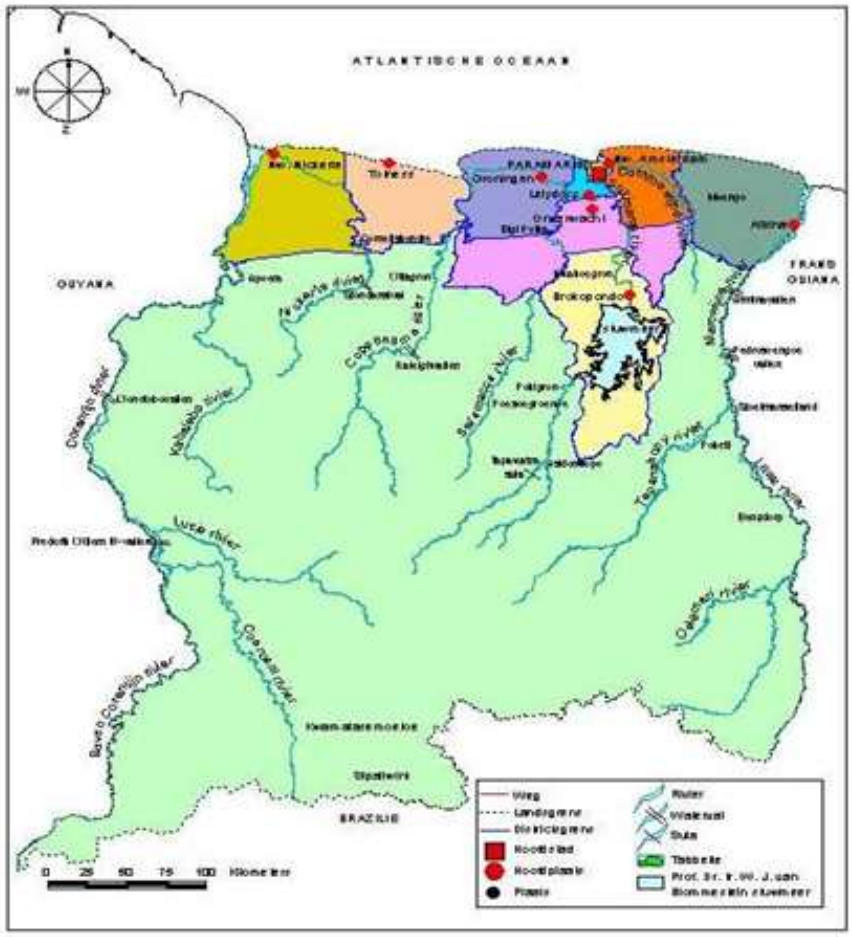

Figure 1 Map of Suriname in districts

The land area of Suriname is 163.820 sq. km. (ABS, 2012). Suriname is divided into 10 districts, of which 7 are coastal districts (from West to East): Nickerie, Coronie, Saramacca, Wanica, Paramaribo, Commewijne and Marowijne. South of these are the districts of Para, Brokopondo and Sipaliwini. Sipaliwini is about 130.600 km² which covers about 80% of the national surface. The country is further subdivided into sixty-two resorts.

4.1.2 Physiography

According to the physical geography Suriname belongs to the Guiana plateau, which, except for the lower coastal area in the north, represents a large Guiana shield. This shield is composed of

Precambrian rocks, which is for its largest part deeply eroded and weathered. The most significant height of the Guiana plateau in Suriname is situated approximately in the center of the country reaching a height of about 1200 meters. The remaining part is of the monotonous landscape type of about 200 - 600 meters above the mean sea level. The coastal area in the north predominantly consists of young clay sediments of Amazon origin and sand contributed by the local rivers, which flow generally in the south – north direction. (NIMOS, 2005) The land area of Suriname is generally divided in five main geographic regions identified from north to south as follows: 1) the Coastline, formed by extensive mud flats and sandy shell beaches; 2) the Young Coastal Plain, ranging in width from about 20 km in the east to about 100 km in the west with height variations of 0–4 m above sea level; 3) the Old Coastal Plain, remnants of ridges, gullies and mud flats, with height variations of 4-10 m above sea level; 4) the Savannah belt, consisting of coarse bleached white sand and yellowish brown sands to clay loams, ranging from 10-100 m above sea level; and, 5) the Guyana highland region of the Interior, covering about 85% of the country with highly weathered Precambrian formations and heights of above the 100 m sea level. (NIMOS, 2005).

The coastal area is primarily made of sediments from the seven main rivers that generally flow south to north from the interior where there is a dense network of streams, to the extensive swamps at the coast. Along the coastline there are areas where the ground level is lower than the water level in the sea or in the river during high tide. Existing ridges and natural barriers such as mangroves typically provide sufficient protection except at high tide, when water can overtop. The vegetation helps stabilize the soil further and aids the sedimentation process. The land behind these barriers is lower due to consolidation of the sediment. Where land has been reclaimed an earthen dam is typically constructed with canals and sluices for drainage.

The majority of the coast (340 km) used to be protected by mangroves, with only 12 km having man-made structures (Nickerie and Coronie). Despite the advocated advantages of natural defenses, a choice has been made for a man-made dike to protect the coast of Commewijne as well[16]; which is in construction at the time of this report.

The fertile soil of the young coastal plain combined with the large freshwater swamps and rivers have resulted in large-scale agriculture being focused in this area (NIMOS, 2005). Forest covers about 91% or 15 million ha of the total land area of which about 2 million ha or 13%, has the status of Protected Areas (4 Multiple-use Management Area, 1 nature park and 11 Nature Reserves). Forest is one of the important natural resources in Suriname. Other important natural resources are bauxite, kaolin and hydrocarbons. The main source for the existing water resources of Suriname is the re-occurrence of abundant annual rainfall, which together with the topography, soil and land cover has resulted in many streams and large wetlands. Seven main rivers, originating in the hilly to mountainous interior of the country convey about 4,800 m^3/s fresh water annually into the Atlantic Ocean, which is about 30% of the annual rainfall. The Marowijne and the Corantijn, being the trans-boundary rivers in the east and west respectively, contribute 70% to the total discharge. Of the remaining rainfall, the largest part evaporates and only a small part percolates into the ground forming ground water reserves. The hilly to mountainous interior is covered with forests, and has a dense network of streams in contrast with the low-lying coastal areas, where fewer streams and extensive swamps are found. Depending on the water quality the latter is divided into salt, brackish and freshwater swamps. Rivers and freshwater swamps constitute the surface water resources; whilst freshwater of various aquifers constitute groundwater. The first mentioned resources are mainly used for irrigation, i.e. rice, banana and generation of hydroelectricity, whilst the latter is used for potable purposes. Extracting freshwater from these resources enhances the saltwater intrusion. Rises in the sea level further promotes this intrusion (NIMOS, 2005).

[16] This will be elaborated in Chapter 6 under the risk of coastal erosion

4.1.3 Climate

Suriname is located from 2 to 7° north of the Equator and has a typically warm and moist tropical climate. Mean air temperature is 25-27.5°C throughout the year in the north, and a little cooler, at around 23-25°C in the southern regions. The average daily temperature in the coastal region is 27º Celsius (ºC). January is the coldest month (average 26 ºC) and October is the warmest (average 31ºC). Annual variation of the average temperature lies within a range of 2-3°C, in relation to variation of daily temperature, which is 7-8°C. On a long-term basis a slight change in the air temperature is observed. For the capital Paramaribo, the mean annual temperature over the last 30 years has risen with about 1.0C.

Suriname experiences two rain seasons; a major rain season when most of the country receives 250-400mm per month between May and July, and a minor rain season bringing around 150-200mm per month in November to January.

Inter-annual variations in climate in this region are caused by the El Niño Southern Oscillation (ENSO), which occurs once every 2-7 years. El Niño episodes bring drier conditions throughout the year, and bring warmer temperatures between June and August, whilst La Niña episodes bring wetter conditions throughout the year and cooler temperatures between June and August (UNDP Climate Change Country Profile).

Case studies in Suriname show that El Niño periods coincide with very dry years in the coastal area of the country. The 1997-1998 El Niño year had a negative impact in most of the productive areas, resulting in high levels of dislocation in many socio-economic sectors.

The mean wind speed is 1.3 Beaufort. Maximum mean wind speeds occur during the dry seasons attaining 1.6 Beaufort in February with a second peak in September and October. Minimum mean wind speeds of 1.0 Beaufort occur in January. At the coast the wind speed is 3-4 Beaufort during the day, becoming gradually weak to calm during the nocturnal hours in the interior. These values are expected to change in accordance with the temperature change.

For the coastal regions daily air humidity in average is as high as 80-90 percent. In central and southern regions of the country, daily air humidity decreases and averages about 75 percent. In the forest tracts air humidity depends, among others, on the penetration of sun radiation. Variation of relative air humidity in forest tracts lies within the limits of 70-100 percent and between 50-100 percent in open areas (NIMOS, 2005).

As **Error! Reference source not found.** below shows, the major rain season is clearly visible reaching its peak in May whilst the major dry season is clearly visible reaching its nadir in September.[17]

[17] Data from the Meteorological Service, Ministry of Public Works, generated November 2014

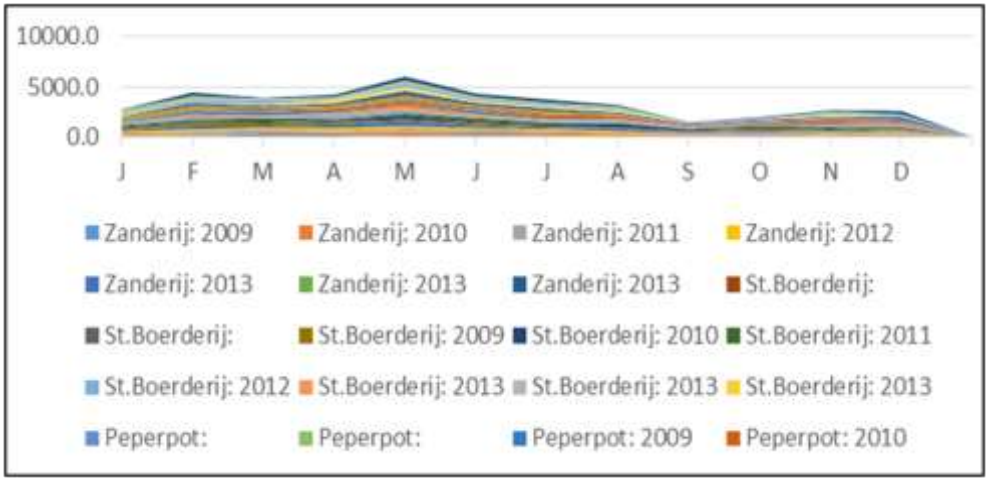

Figure 2. Precipitation (mm) measured by weather stations in Commewijne and Para per month (2009-2013)

4.2 SOCIO-ECONOMIC CONTEXT

4.2.1 Population and Demographics

As of August 2012, Suriname had a total population of 564,454, according to the Surinamese General Bureau of Statistics (ABS 2012). The population is largely concentrated in Paramaribo, the capital of the country. Suriname's colonial history has played a major role in the multi-ethnic composition of its population. Until the abolition of slavery in 1863, Western Europeans imported slaves from the west coast of Africa. Later, contract laborers were attracted from India, Indonesia and China to work on plantations. Suriname's population consists of the following ethnic groups: Indigenous Peoples (natives), Maroons (descendants of runaway slaves), Creoles (of African or mixed descent), Hindustanis (from the Indian sub-continent), Javanese (from Indonesia), Chinese, Lebanese, Brazilians, descendants of European settlers and mixes among these ethnic groups.

The official language is Dutch. Sranang Tongo, the lingua franca, is widely spoken as well. Most of the ethnic groups also use their own languages. A wide diversity of religions and traditions is practiced. In 2012, Christianity continues to be the largest in numbers (262,320), followed by Hinduism (120,623) and Islam (75,053).

As of 2004, about 67% of Suriname's total population was concentrated in the capital and 20% in the other coastal districts. The remaining 13% was concentrated in small, mainly tribal communities along rivers of the interior. The overall population density was 3.0 people per km², which makes Suriname a very lowly populated country. In 2012, Paramaribo and Wanica continue to be the most densely populated districts with a population density of 1,324 (slight decrease from 1,335 in 2004) and 267 (considerable increase from 194 in 2004) people per km2, respectively.

From 1989 to 2009, the rate of population growth for Suriname has remained fairly constant between 1.0% and 1.5%. Life expectancy for males is 67.7 years and for females 71.9 years (MDG 2009). Growth has however been uneven among different ethnic groups, as shown in *Table 2* below.

Table 2. Population growth rate per ethnic group in absolute numbers and percentages (source Table H1. Census 2012, ABS)

	2004		2012		Growth	
Ethnic group	**Absolute numbers**	**% of total population**	**Absolute numbers**	**% of total population**	**Absolute numbers**	**Growth in %**
Maroon	72,553	14.7	117,567	21.7	45,014	62.0
Creole	87,202	17.7	84,933	15.7	-2,269	-2.6
Hindustani	135,117	27.4	148,443	27.4	13,326	9.9
Javanese	71,879	14.6	73,975	13.7	2,096	2.9
Mixed	61,524	12.5	72,340	13.4	10,816	17.6
Other[18]	31,975	6.5	40,985	7.6	9,010	28.2
Unknown	32,579	6.6	3,395	0.6	-29,184	-89.6
Total	492,829	100	541,638	100	48,809	9.9

4.2.2 The economy

Since the establishment of Suriname in 1667 as a Dutch colony, it was exploited mainly for sugar and coffee production on plantations. The history of Suriname's economy is therefore a plantation economy, based on hundreds of plantations established along the rivers of the coastal area. This plantation-based economy declined in the 19th century and came to its end in the first half of the 20th century. The gold rush that occurred in the second half of the 19th century was an important new economic activity, but it soon declined due to disappointing gold finds and high exploitation costs. Efforts to introduce rubber and wood production in the first decades of the 20th century did not achieve expected results. Since World War II, the economy has been largely based on bauxite mining and processing activities, which are carried out by a joint venture of ALCOA and BHP Billiton.

From the 1960s onwards, exports of bauxite, alumina, and aluminum have accounted for 70-80% of total export revenues, the bulk of government revenue. Before achieving independence from the Netherlands in November 1975, the Surinamese economy was highly centralized and inwardly oriented, with a dominant and expanding public sector, deriving much of its buoyancy from the foreign-owned bauxite mining industry. After independence, the bauxite sector continued to dominate in terms of its contribution to the economy as a whole. To marshal the development of this small and undiversified economy, the government received a development grant from the Netherlands at the time of independence. Due to these two mainstays, the economy grew at average rates exceeding 3% per year in the first seven years after independence. During the mid-1980s, the economic situation worsened on account of declining commodity prices on the world market and the suspension of the aid from the Netherlands in 1983, following the violent death of 15 opponents of the then military regime. The civil war in the interior that lasted from 1983 to 1987 destroyed much of the economic infrastructure of eastern Suriname, such as roads and bridges, as well as some rural economic activities, such as palm oil production. The period from 1992 to 1995 was characterized by the implementation of a Structural Adjustment Programme (SAP), designed to revitalize the economy and arrest negative growth rates of GDP and avert impoverishment of the population. As a result, GDP

[18] Indigenous Peoples were not counted separately in these overview tables by the General Bureau of Statistics. Their absolute number in 2012 was 20,344 and their percentage 3.8% of the total population(Table 6.1)

first showed a negative growth but then recovered, showing high positive results in the late nineties. The first ten years of the 21st century have seen stable economic growth. In the nineties, annual GDP growth rates fluctuated between -7% and +6%, but they have reached a more stable rate of slightly more than 4% during the past five years. National income per capita also shows stable growth over the past ten years.

The economy can be characterized as beyond transitional, with a large tertiary sector that is not yet developed. The bauxite sector still plays an important, but much smaller role in the economy of Suriname with regard to foreign exchange earnings and government income, and the economy is not well-diversified; a large percentage of bank capital is committed to unproductive sectors (mainly trade). Companies face long bureaucratic procedures; state-owned or partially state-owned companies operate at a loss; the public sector is functioning inefficiently and there is little large-scale manufacturing. In recent years, however, tourism, construction and financial services—as well as the corresponding personal consumption—have played a role in the diversification of the economy, moving it away from over-reliance on the export of raw materials (Nijbroek & Meaney, 2011). Gold and oil mining is however continuously expanding (DCB, 2014).

In 2012, Suriname's public debt and debt-service burdens are the lowest among its Caribbean neighbors (at 19 percent and 2 percent of GDP, respectively), and there is only a low risk of debt distress. The level of nominal GDP in 2010 was about 20 percent higher than previously assessed. Since 2009, economic growth has been fluctuating between 3 and 4 % (IMF report 2012).

4.2.3 Poverty and Unemployment

Economic growth is however not distributed equally. The Gini coefficient (or income inequality) for Suriname is 0.52[19] (IDB, 2011). This is far above the average Gini coefficient in the Caribbean (0.38), and places Suriname in the ranks of countries with higher inequality, such as Haiti (0.65), St. Vincent and the Grenadines (0.60), Antigua and Barbuda (0.50), and the Dominican Republic (0.47).

Based on internationally used measurement tools, such as the Human Development Index (or the Multi Poverty Index), the poverty level in Suriname has been estimated nationally at 49% of households that live below the poverty line. The HDI is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. Suriname's HDI value for 2012 is 0.684 and positions the country at 105 out of 187 countries, and in the human development category Medium.

Between 1980 and 2012, Suriname's life expectancy at birth increased from 65.9 to 70.8, by 4.9 years and expected years of schooling increased from 10.2 to 12.4, by 2.2 years. Suriname's GNI per capita increased by about 37% between 1980 and 2012 from 5.331 to 7.327 (UNDP, Human Development Report 2013). Despite economic growth, there is no minimum wage; and an increase in temporary contract labor, with little protection and insurances for workers, especially low income workers.

There is a relatively large informal sector in Suriname that continues to grow, according to different sources. The term informal refers to economic activities that take place beyond the official economy, or the conduct of economic activities by companies and individuals that do not comply with the (legally) established requirements. In 2008 the contribution of the informal sector to real GDP (at

[19] The Gini coefficient measures the inequality among values of a frequency distribution (in this case, levels of income). A Gini coefficient of zero expresses perfect equality where all values are the same (for example, where everyone has an exactly equal income). A Gini coefficient of one (100 on the percentile scale) expresses maximal inequality among values (for example where only one person has all the income).

market prices) was estimated at 17.5%. For real GDP at basic prices the contribution of the informal sector is even higher, namely 20.4% in 2008. (GoS, MDG Progress Report 2009)

The unemployment rate, declined from 16% in 1998 to 11% in 2011 in Paramaribo and Wanica (Statistical Yearbook 2011, GBS 2012).

4.2.4 Most Vulnerable Groups

Women

In the last decennia the share of women in the country's labor force showed a continued but very slow rise. Due to the unequal task division in the prevailing gender relation, women's contribution to the economy remains mainly invisible, as the economic activities of women are still largely concentrated in the private sphere of the home, agriculture, food production, the community, or the informal labor market, and therefore remain unrecorded, unremunerated or undervalued.

As **Error! Reference source not found.** below shows, in a 12 year period women's participation in the (paid) labor force grew only with 5%, from 32% in 1998 to 37% in 2010. The government is one of the largest employers of women[20]. About half (50.3%) of government employees is female, mainly working in the education sector as teachers, in administrative jobs and in lower servants jobs.

Table 3. Women's participation in the (paid) labor force in Suriname

Women in waged work 1998-2010	Total wage employment in non-agricultural sector	Absolute share of women	Women in % of number of working people
1998	88,816	28,557	32%
2010	188,229	69,484	37%

In the private sector most women are positioned in the lower commercial jobs. More recently, increasingly women have become self-employed and own small enterprises, mainly in the informal sector and often in traditional areas (embroidery, catering, small craft, etc.)

Women are underrepresented in the agricultural, mining, transport, construction sector, and overrepresented in the public administration and wholesale and retail sector. Women are also less represented than men in higher management positions in both public and private sector. The vast majority of job seekers registered at the unemployment register are women. In 2013 they accounted for 75% of all registered unemployed.

The share of youth in employment decreased further from 14.5% (16.2% for males and 11.5% for females) in 2004 to 12% in 2012. In 2012 the youth between 15 – 24 years accounted for 12% of the employed population, with a share of 8.7% for young women and 13.6% for young males. Striking in the figures is the incongruence between the high levels of female enrolment in school and the disproportionately low female participation rates in the labor force. (NBG/UNWOMEN/ECLAC 2014).

Based on their level of dependency, senior citizens, children, people living with a disability and people living in institutions can be categorized as vulnerable groups as well.

Indigenous and Tribal Peoples

[20] Government employees constituted approximately 61 percent of the estimated 125,000-member formal sector workforce

One of the main problems affecting Indigenous and Tribal peoples in Suriname is the absence of any effective legal safeguards for their traditional territories. Although legislation mentions that they are entitled to use and enjoy their villages, settlements and current agricultural plots, it does not recognize communal land rights. By law, the state owns all un-granted land and all natural resources; therefore resource exploitation concessions can be issued without consent of the indigenous and tribal peoples who do not hold recognized titles to their territories. (Forest Peoples Program and Association of Saramaka Authorities, 2007). The vulnerability of indigenous and tribal peoples is further compounded by the socio-economic marginalization, limited quality education and health care, limited infrastructure and (tele)communication facilities and limited food security as experienced during the 2006 floods, all of which negatively influence their adaptability and resilience capacities.

Migration and Mobility

The interior is currently facing large inflows of local and foreign labor migrants attracted by the booming and rapidly expanding gold mining activities in these areas. Given the chronic lack of employment, healthcare, and education in rural areas however, urbanization increased from 45% in 1975 to 76% in 2004 (IDB 2006). These internal migration patterns are dominated by families of the interior moving to Paramaribo, where they often live in low income communities and face multiple socio-economic and cultural problems. Since secondary education is largely unavailable in the rural districts, students also move to the capital to continue their studies (Terborg et al 2009).

It is important to note that in this aspect, both Para and Commewijne are *in-between* or *transit* districts.

4.3 GOVERNANCE STRUCTURE

4.3.1 Political Structure and Organization

a) Political organization

Suriname has a combined presidential/parliamentarian system[21], where the people vote for Parliament and the Parliamentarians vote for the President. The President should be elected in Parliament with 2/3 of the votes, or 34 out of 51 seats. If this cannot be achieved in two rounds of voting, the decision (by simple majority) goes to the *Verenigde Volks Vergadering* (VVV), a combination of all elected people on national and local level. Citizens have the opportunity to vote on two levels: on a national level for Parliament; and on a local level for Ressort Councils. National elections are held every five years with the last election occurring on May 25th, 2010.

Suriname has 10 electoral districts each comprised of different ressorts depending on population density. The electoral system was redesigned to benefit the districts with a lower population density; this system is meant to promote the representation at national level of the rural districts which were in the past often neglected, politically and policy-wise. A seat in the interior is therefore won with fewer votes than a seat in the capital. In recent years concerns have been voiced about the counter-effect; the domination of political parties who gained seats in the interior over parties who gained seats in the capital (Schmeitz, 2010).

b) Political structure

[21] The parliamentary system was combined with the presidential system in a change of the Constitution in 1987

The executive branch of government consists of the central and local government, and over 120 statutory agencies. The central government consists of the presidency, the vice-presidency, the Council of State, the Auditor's Office, and the Council of Ministers.

The President is the Head of Government with the power to hire and fire Ministers. The Vice-President acts as his/her deputy and chairs the Council of Ministers.

The Council of State, with representatives from labour unions, employers' associations and political parties, advises the President on policy matters. It has the power to veto legislation but the final veto lies with the President (GOS/EU, 2007).

Suriname adheres to the principle of the Trias Politica, meaning a division between the legislative (Parliament), the executive (Government) and the judicial (Court of Law).

c) Indigenous and Tribal Peoples; Traditional Authorities

Suriname is home to four distinct Indigenous Peoples (Kalinya, Lokono, Trio and associated peoples, and Wayana) comprising up to five percent of the population. It is also home to six tribal peoples (known as Maroons) – Aucaner or N'djuka, Saramaka, Paramaka, Aluku, Kwinti and Matawai – totaling around 15 percent of the population (FPP, 2007). Maroons qualify as tribal peoples according to international definitional criteria and enjoy similar rights to indigenous peoples under international law[22].

Suriname was among the 143 States that voted in favor[23] of the United Nations Declaration on the Right of the Indigenous Peoples[24] that was adopted on September 13, 2007. The Declaration affirms that Indigenous Peoples are entitled to the full range of rights established under international law. It specifies, amongst others, the rights to be given access to land, to receive equal treatment, to participate fully in public life, and to have a right to maintain their distinctive identities, cultures, languages and ways of life (Hollingsworth 2014; p. 7-10).

Historically, traditional authorities of Indigenous and Tribal Peoples have *de facto* been governing their territories in the interior. *De jure*, traditional law has been tolerated next to the central State legislation. The Government of Suriname recently drafted legislation for Traditional Authorities[25], taking into account the need to regulate the administrative relations between the central government and traditional authorities. The law seeks to integrate the traditional authorities in the structures of the Ministry of Regional Development. Responses from representatives of traditional authorities have been negative, defining the Concept Law as a direct attack on the culture and tradition of the tribal communities. [26]

d) Political culture

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[22] See, article 1 of International Labour Organization Convention No. 169 Concerning Indigenous and Tribal Peoples in Independent Countries 1989, which provides that 'This Convention applies to: (a) tribal peoples in independent countries whose social, cultural and economic conditions distinguish them from other paragraphs of
the national community and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations.

[23] 4 votes against (Australia, Canada, New Zealand and United States; all of these later reversed their vote and expressed formal support) and 11 abstaining

[24] http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

[25] Conceptwet 2014, houdende de regels over het Traditioneel Gezag

[26] Written statement by Ms. Renatha Simson, Director of the Bureau of the Association of Saramaka Authorities, December 3, 2014

Suriname's party system is characterized by a large number of political parties, many of which are defined, albeit unofficially, by ethnic preferences and not by ideological differences. Despite the rapid turnover of small parties, most of the large parties have existed for decades (IDB, 2001).

Going towards national elections in 2015, there are concerns voiced in the media about the disproportionate electoral system fostering ethnical tensions.

Patron-client relationships have existed in Suriname for centuries, originating from the economic relationships between plantation owners and their tenants/slaves. These relationships seriously jeopardize the empowerment of local communities favoring vertical relationships based on dependence (e.g. persons of higher socio-economic status providing material benefits or protection to individuals of a lower socio-economic status) as opposed to the horizontal, cooperative relationships that one would expect in small communities or neighborhoods (Government of Suriname, 2006).

The political patronage system works both ways: it gives jobs and positions to people who are politically loyal but not necessarily qualified or competent, and in return it expects their collaboration in serving the interests of political friends (Schmeitz, 2004). In practice this means whenever a new Administration comes into power, staff on all levels of civil service and state enterprises run the risk of being replaced or reshuffled. This results in an ever declining institutional memory; and a very limited sustainability of capacity-building. This clearly hampers the effectiveness of policies and programs.

Anti-corruption legislation was part of the election programs of most political parties and combinations in the last elections of 2010[27], and it is a recurring theme in current campaigning towards the upcoming elections in 2015.

Suriname scored 37 (2012), 36 (2013), and 36 (2014) on the Corruption Perception Index.[28] Ranking for these respective years was position 88, 94 to 100 of over 150 countries[29].

4.3.2 Local Government and Levels of Decentralization

Suriname has inherited a very centralized government and local government structures did not exist prior to the 1980s when political representation at the local level in 10 districts and 62 sub-districts was established. These efforts were formalized and given greater standing with the passage of the 1987 Constitution and the Act of Regional Institutions in 1989 (IDB 2001).

The Decentralization and Local Government Strengthening Program (DLGP)[30] which was prepared from 1998 to 2003 and implemented in 2 phases from 2004 to 2014, made the Act really operational. The goal was mainly to empower the districts' governments with the core legal framework and institutional capacity necessary for financial self-management.

Both Para and Commewijne were part of DLGP phase I (5 pilot districts) and were certified Legal Level 1 for financial decentralization on November 9th 2006. December 22nd 2006, all 5 pilot districts were certified Legal Level 2 for improved capacity to execute infrastructural works. In 2008 all compulsory experimental projects for road paving were delivered, strategic development plans were formulated (including social contracts, policy priorities and spatial planning) and all conditions met for a continuation of the DLGP into phase II(DLGP, 2014).

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[27] Article 'From Promise to Policy" in State of our Democracy 2014. Annual newsletter by Foundation Projekta, 5th edition, November 2014

[28] Scores on a scale from 0 (very corrupt) to 100 (very clean)

[29] Corruption Perception Index by Transparency International

[30] Financed by IDB

Suriname, by successfully implementing DLGP-I en DLGP-II, meets the international standards to continue into a DLGP-III. The DLGP will come to a formal end on December 20, 2014 however because the legal condition for continuation (legislation for further fiscal decentralization) was not met. DLGP III would have allowed financing of the Multi-annual District Strategic and Development plan (DSOP), that has been prepared for each district, with the intention they would execute those projects from their own 'roots' (ressorts). Since the National Budget for 2015 does not provide for this, there are some concerns about future perspectives.[31]

The actual operation of decentralization will be discussed in further detail under capacities (6.4).

4.3.3 Coordination Mechanisms between State and Non-Governmental

Nongovernmental Organizations (NGO's) and Community Based Organizations (CBO's)

Compared to the 1990s, the role of NGO's in the new millennium has become weaker, both nationally and internationally. Donors and development partners used to invest heavily in civil society and demand legal stature from organizations to be eligible for funding. As a result, capacity building of community based organizations (CBO's) often implied becoming a legal body. Larger NGO's with the capacity to assist CBO's received institutional strengthening to act as intermediaries. With the financial crisis in the USA and Europe, this process came to an abrupt halt.

With Suriname declared Middle Income Country (MIC) status based on its GDP, generating funds for implementing of programs and projects will become even more challenging. Some of the NGO's active in development issues have organized themselves into platforms and networks.

Private Sector and Labor Movement

Both the private sector and the labor movement are represented in the State Council. Since March 2004, the social dialogue between government, employers, employees and other civil groups, has been institutionalized by law into the *Sociaal Economische Raad* (SER)/Social Economic Council.

On March 23, 2011 the President installed the *Tripartiet Overleg* /Tripartite Consultation to advise the government on, amongst others, labor issues and social-economic development.[32]

Both employers and employees are organized in associations and unions, with umbrella bodies.

4.4 DEVELOPMENT CONTEXT

4.4.1 National Development Objectives

The 2012-2016 Multi – Annual Development Plan for Suriname (MOP) presents a development strategy that is based on taking responsibility for an independent national development. The development strategy builds on fundaments, orientations, conditions and instruments to transform society towards realizing development goals (MOP, p. 18).

Fundaments are: a sense of unity with respect for cultural diversity; active participation of the people motivated by belief in own capacities and possibilities; and a free and objective press who facilitates society with critical and educational communication (18-19).

Orientations are: promoting connectedness with nation and territory; protections of the environment and safeguarding of biodiversity; equal opportunities and treatment for all; specific efforts to reach gender equality; emphasis on social security for senior citizens and people living in poverty; full

[31] Interview with Mr. B. Ahmadali, Managing Director DLGP-I and DLGP-II, De Ware Tijd, October 15, 2014
[32] www.gov.sr › Home › Regering › Adviesorganen

opportunity for youth to educate, develop and express themselves; creating a just distribution of economic wellbeing, prioritizing employment and housing; connectedness with the region and the world population as a whole; peace and security and therefore prevention and combating of all forms of crime; and a culture of serving and supporting one another.(p.19-20)

Conditions are: people-centered development aimed to achieve a basic standard of living for all (including access to water, electricity, education and health); availability and access of data; inclusion of the Millennium Development Goals; the priority of lifelong learning to guarantee continuous development of necessary skills and qualities; the focus on science, research, technology and the integration of ICT; geographical distribution of development over the entire country; and the promotion of physical activity and sports. (p.20-21)

Instruments are: evaluation/adaptation of legislation and procedures to facilitate investment in Suriname; raising national production and exports; using the non-sustainable sectors of economy (mining of bauxite, gold and oil)[33] to finance the development of sustainable sectors: agriculture, forestry, services and so on; facilitation of entrepreneurship; guaranteed constant provision of energy to support economic development; infrastructure including telecommunication; highest priority for policies on land and spatial planning to strengthen both social justice and production; an immigration policy integrated in the population policy motivated by actual gaps in human capital and investments; formalized involvement of private sector and labour movement in development policy; implementation of Public Sector Reform; safeguarding monetary stability and trust in national currency (SRD); transformation of tax system; decentralization and participation in decision-making; garnering diplomacy on different levels to realize development goals; good governance with checks and balances; and an independent and objective judicial system.(p. 21-23)

A Steering Team would be established to support and stimulate the actual implementation of the MOP 2012 – 2016 (p.23).

[33] Related to mining: updating of the map of natural resources (1977); and establishment of national mining companies (p. 21)

5. THE COUNTRY'S DISASTER RISK REDUCTION LEGAL, NORMATIVE AND INSTITUTIONAL PROFILE

5.1 Legal Framework

5.1.1 Constitution[34]

In the constitution of Suriname, there are no specific provisions regarding Disaster Management or Risk Reduction for disasters, only general provisions related to emergencies. Among others, there is a provision relevant to man-made disasters under CHAPTER VIII, THE SOCIAL ORDER, in Article 48:

'The State shall inspect the production, storing and handling of chemical, biological, pharmaceutical and other products, intended for consumption, medical treatment and diagnosis'.

Also, in the second Paragraph of CHAPTER XII, POWERS OF THE PRESIDENT, Article 102 (paragraphparagraphs 3 and 4) refers to the mandate of the President to maintain external and domestic security:

Art. 102 (paragraphpara 3): To maintain external and domestic security, in case of war, danger of war or in case of serious threat to or disturbance of the domestic order and peace which could result in substantial damage to the interests of the State, the President can declare the state of emergency in any part of Suriname, subject to previous consent of the National Assembly.

Article 102 (paragraphpara 4): The President does not declare the state of emergency ended, unless after previous consent of the National Assembly. This consent is not mandatory when consultation with the National Assembly has not been possible due to force majeure. (Constitution of the Republic of Suriname)

The Constitution does not prescribe the criteria for declaring a state of emergency. The area of flooding in 2006 was declared an emergency area which enabled a request for international assistance; however, the flooding in 2008 did not receive this status. It may be necessary to develop guiding protocols for declaring a state of emergency while still allowing for context-specificity and flexibility, including an indication of which information would be necessary; and how this information would be generated in times of crisis.

5.1.2 Laws and Legally Binding Provisions

a) Mandate of the District Commissioner

Under the Act of Regional Bodies[35], the District Commissioner has a lead role in the Disaster Management System of the country. CHAPTER IV Paragraph 1 specifies the executive power in the districts.

Article 46 (paragraphparagraph 1): the daily management of the districts is formed by the District Administration [Districtsbestuur], that is subject to supervision by the District Council [Districtsraad].

[34] Constitution of the Republic of Suriname SB 1987 no. 116 Revised April 8, 1992 SB 1992 no. 38

[35] Act of June 29, 1989, rules regarding the arrangement and powers of the Regional Bodies S.B. 1989 no. 44 as revised by SB 2000 no. 93 and SB 2002 no. 5444

Article 46 (paragraphparagraph 2): the District Commissioner coordinates operations of the civil service in the district and leads the preparation of policy to be determined by the District Council, with regard to the housekeeping of the district.

This is further detailed in Article 47 (paragraph 1):

Daily management consists of:

The execution of and monitoring of the compliance of: laws, resolutions, decrees by State or Ministry, as far as this has not been assigned to another body; district ordinances and permanent decisions of the District Council, that do not contain generally binding rules;

Maintaining peace and order in the district following the legal regulations and guidelines as stipulated by the Minister tasked with judicial affairs.

Preparing the writing of district- and ressort plans, and execution of plans approved;

The management of the District Fund and other revenues and expenditures, as far as this is assigned to the District Commissioner by law;

The conservation and maintenance of secondary and tertiary roads and bridges, drainages and other public infrastructure;

The care for usability and safety of squares, public gardens and other public places;

Supervision of public health care and funeral services;

The care for fire prevention and firefighting and what this further entails;

The response to other disasters or calamities within the district, as far as this has not been legally assigned to another body;

The continuous monitoring of all that is relevant to the district;

Other subjects to be indicated by State Decree.

The Act on Regional Bodies gives the District Commissioner a specific mandate to handle disasters and calamities in Article 49, paragraphparagraph 1 and 2:

(Paragraph 1) in case of necessary assistance to respond to fire, flood and other disasters or calamities as referred to in art. 47 paragraph 1, the District Commissioner can:

Demand the use of buildings, and oblige owners of transportation means to transport certain persons or goods, possibly to places outside of the district;

Demand from every physically capable resident of the district to provide assistance to the general interest.

(Paragraph 2) The persons indicated in paragraph 1 are obliged to obey the demand; in case of non-compliance they can be forced by the police.

This mandate is identical to Article 10 of the *Reglement Beheer der Districten*.[36]

The Police Charter completely corroborates the previous mentioned arrangement in Article 16 : **Cooperation with District-Commissioners on public order and safety** 1) In the fulfilling of her duty the Police follows orders of the District Commissioner on public order and safety in his district. These orders are preferably given to the Commander in charge; 2) In case of serious riots or disasters, and

[36] Interview with DLGP director B. Ahmadali November 13, 2014

the immediate threat of such, the Commissioner of the district is authorized to give all necessary orders, including the use of weaponry. If possible, he requests council from the Minister first; he informs the Minister, the Attorney General and the Commissioner of Police as soon as possible about the measures taken.

The Act on the Fire Department also corroborates this is in Article 6, paragraph 3[37]:

(Paragraph 3) The Districts-Commissioner, entrusted with the care for maintaining peace and order in his district and who therefore is in charge of the police in his district, is also in charge of the Fire Department in his district.

The National Coordination Centre for Disaster Management (*Nationaal Coordinatie Centrum Rampenbeheersing*, abbreviated NCCR) was created as a special committee of the President, in its first years of existence, administratively resorting under the Ministry of Defense. The Head of the NCCR indicated in 2012 that the legal base of the Center was under construction, as well as the development of a Disaster Management Legislation. The purpose is to set up a Comprehensive Disaster Management System. [38]

Unfortunately to date the draft Disaster Management Legislation and the Law providing NCCR a legal base have not been approved as yet. Steps have been made however towards formal recognition of the importance of disaster management at different levels of policymaking. Since 2014 the NCCR has been drawn into the Cabinet of the President (which falls administratively under the Ministry of Home Affairs). NCCR was also appointed as the Coordinating Institute for CDEMA In 2012[39], upon ratification by the National Assembly of Suriname's membership of CDEMA.[40]

b) Environmental Legislation

An important step has been the production of a compilation of National Environmental Legislation – Legal Framework for Nature Management in 2012. The document is the result of a project financed by **Suriname** Conservation Foundation (SCF) and implemented by Schurman Advocaten (2009-2013), and gives an overview of national legislation and international treaties concerning the environment and nature management. Furthermore it identifies institutions and organizations according to their tasks and responsibilities. Even more important is the website that makes all this information digitally accessible. It is maintained regularly to keep information updated (Conservation Foundation Suriname 2013). The National Environmental Framework Legislation which exists in draft, still needs to be discussed and approved by Parliament.

c) Legislation on Construction

To enhance safety, quality, sustainability and aesthetic design of construction, the Council of Ministers revised the Act on Construction by State Decree [41]. According to the revised legislation all building plans must be submitted by a licensed architect, with the exception of dwellings with a floor area less than 100 m2 (article 1, paragraph 5; article 12, paragraph 2-5).

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[37] Wet van 13 maart 1996 houdende regelen inzake de Brandweer in Suriname (Wet Brandweer Suriname 1993; S.B. 1996 no. 016)

[38] Interview with Colonel Slijngard, Head of NCCR in Draft Country Profile 2012

[39] Wet van 22 nov 2012 Goedkeuring CDEMA; SB 2012 No 180

[40] Interview with Colonel Slijngard, Head of NCCR, December 9, 2014

[41] **Bouwbesluit no. 1Staatsbesluit** van 8 november 2002 ter uitvoering van artikel 1 en 3 van de Bouwwet (G.B. 1956 no. 30, G.B. 1956 no 108, zoals gewijzigd bij G.B. 1970 no. 67, S.B. 2002 no 93).

The Act on Construction limits itself geographically to the area of the *city* of Paramaribo. The Act does not provide technical requirements pertaining to disaster prevention. Article 4, paragraph 2 of the Act on the Fire Department[42] specifies the review of building plans on fire safety criteria (in cooperation with the Bureau for Supervision of Buildings and Dwellings (*Bureau voor Bouw- en Woningtoezicht*), as part of the prevention tasks of the Fire Department.

Since November 2011, updated Standards for procurement of works[43] and standards for the administrative execution of works[44] have been published.[45] The need for technical Standards regarding disaster prevention has been discussed publicly, but legislation to this end has not yet been initiated.

d) Land Registration and Information System Act

The initial Land Registration and Information System (*Grond Registratie en Land Informatie Systeem, GLIS*) project of 2003 listed as goals to: Redefine a geodetic reference system; Produce air and digital maps of the coastal zone; Collect/purchase satellite images of the entire country; Set up a decentralized data collection system with units in all 10 districts; Set up a data-exchange platform for cadastral data; and conducting cadastral research.

To realize these goals, all departments relevant to land registration should be incorporated in a Domain Enterprise, which would have full authority in domain policy. The GLIS legislation (S.B. 2009 no.149) was passed and published May 27, 2010, without this Domain Enterprise however.

According to the law, all issued land should be registered in the GLIS, including concessions for mining of rocks, mineral or precious metal (Committee Restructuring ROGB 2011; p.88).

5.1.3 Major Gaps in Legislation

As indicated above, the draft Disaster Management Legislation and the Law providing the legal basis for NCCR have not yet been approved by Parliament.

The draft National Environmental Legislation has not yet been approved by Parliament.

Land use plays a major role in disaster risk reduction. The State Decree Planning Enactment from 1973 is generally known as the Planning Act (*Planwet*). Although this Act has been approved by Parliament the Planning Enactment (*Planverordening*) never became operational (Schurman, 2012).

5.2 POLICY FRAMEWORK

5.2.1 Policy Instruments for Disaster Risk Reduction Technical and Political Decision Making

The NCCR is the Coordinating Institute for Suriname in the Caribbean Disaster Emergency Management Agency (CDEMA) and is collaborating with this agency for the development of the

[42] Wet van 13 maart 1996 houdende regelen inzake de Brandweer in Suriname (Wet Brandweer Suriname 1993; S.B. 1996 no. 016)

[43] Aanbestedingsreglement voor werken in Suriname (AWS 1996)
[44] Uitvoeringsvoorwaarden voor Werken in Suriname (UWS 1996)
[45] Website of **UAS** (Union of Architects in Suriname): http://www.uas.sr.org/content/architects_history.asp

Comprehensive Disaster Management System. This regional organization, specializing in disaster management, supports the activities of the NCCR with technical assistance, knowledge (training) and expertise. (Karijokromo, 2011)

According to NCCR each District Commissioner has the responsibility to develop a Disaster Response Plan for the District. The Disaster Response Plans from all the districts will then make up the National Disaster Response Plan for Suriname.[46]

In 2011 Suriname engaged in an agreement with the Inter-American Development Bank (IDB). The project "Support for improving integrated disaster risk management for climate - resilient development" aimed to strengthen national and local capacity for integrated disaster risk management in the context of climate-resilient development.

The Project had as components: 1) The application of the Bank Indicators of Disaster Risk and Risk Management, focusing on flood risk, and a sensitization workshop targeting national authorities; 2) Extension of the UNDP-financed pilot project "Establishing an early flood warning system in the Upper Suriname and Tapanahony Region" implemented by the National Coordination Center for Disaster Preparedness (NCCR), to other vulnerable areas along the coast and in the interior; and 3) Mainstreaming Hazard Mitigation and Climate Change Adaptation, including (a) the preparation of guidelines for integrating disaster mitigation and climate change adaptation at the local government and in the environment and education sectors; and (b) training of staff of the executing agencies of the respective operations.[47]

A workshop on such guidelines was held in May 2013 for a variety of stakeholders. Participants suggested that the Environmental Impact Assessment (EIA) Procedure could provide an opportunity to integrate DRR and CCA considerations. The new procedure could include social aspects and vulnerabilities and might become known as the Environmental and Social Impact Assessment (ESIA) Procedure. With regard to Hazardous Waste Management, participants proposed to make a link with the International Health Regulations (IHR) as well as the Basel Convention.

NCCR indicates that, due to shortage of staff, implementation of mainstreaming suggestions has not yet taken place.[48]

5.2.2 Public Policies

a) Environment/Climate Change

In 2006, in compliance with the requirements of the United Nations Framework Convention on Climate Change (UNFCCC), Suriname submitted its First National Communication. This report was prepared by the National Institute for Environment and Development in Suriname (NIMOS) in cooperation with Surinamese experts.[49]It provides an overview of data and commitments related to climate change and makes a clear link between climate change and natural hazards. As a follow up on the UNFCCC the second National Communication was also published in February 2013 by the Ministry of Labour, Technology and Environment (ATM).

The Ministry of ATM also produced the National Biodiversity Action Plan (NBAP) 2012-2016 in 2013, as an elaboration on the National Biodiversity Strategy of 2006. The NBAP emphasizes the excessive damage to vulnerable ecosystems and species which may result from unsustainable land use.

[46] Interview Head of NCCR in Draft Country Profile 2012
[47] IDB. Project Document Annex LEG/SGO/SU-35487655-10

[48] Interview Head of NCCR, December 2014
[49] Dr. S. Naipal, Professor in Climate Change and Water Resource Management and Dr. C. Becker. Meteorologist

Development projects should be assessed in advance as to their potential environmental damage; and the response to disasters (natural and industrial) must be planned to minimize environmental damage. Desired actions are: 1. Evaluate current land use in function of environmental impact; and 2. zoning of land in function of options for sustainable use.[50]

The cohesion between different Plans (often answering to different international commitments) should be improved. As climate change has a clear impact on biodiversity, the NBAP should be linked up with the National Climate Change Action Plan (NCCAP) from 2007, which has a focus on adaptation and mitigation. The NBAP also shares goals with the National Forest Policy (NFP), with the NFP focusing mostly on production, and the NBAP focusing on rehabilitation and monitoring.

b) Sustainable Development

Important progress is being made in the integration of sustainability in overall development strategies. The most recent SIDS report (2013) identifies five key national priority areas for Suriname:

1. Agriculture and food security
2. Energy, including renewable energy and energy efficiency
3. Natural resources management (including fisheries management, oceans governance, water resources and biodiversity conservation)
4. Climate change and sea level rise
5. Waste management and chemicals management

All priority areas mentioned and elaborated upon in the report have a link with disaster risk reduction (DRR). The challenge is to mainstream DRR into the ongoing sustainable development debate.

c) Decentralization

National planning is by law envisioned to be bottom up. Ressorts in one district used to make annual ressort plans, which would form the basis for the district plan. Within the context of the Decentralization and Local Government Strengthening Program (DLGP) this process now uses public hearings in each ressort to collect direct input for the district plan. The district plans of the 10 districts then should form the basis for the annual national planning. On April 5 2013 District Commissioners officially submitted their annual district plans for 2014 to the Minister of Regional Development.[51]

5.3 INSTITUTIONAL FRAMEWORK

5.3.1 Organization of the National System and Mechanisms at all Levels

a) National Coordination

The National Coordination Centre for Disaster Management (NCCR) is a national organ that coordinates all possible threats of several types of disasters. The NCCR is divided in specialized units:

1. Logistics: takes care of all logistics within the unit such as food and work material;
2. Operation: implements/executes all plans that are being made by the Planning and Research Unit. They also participate during activities regarding disasters;
3. Communication: arranges for all possible communication systems for the division;

[50] NBAP 2013, sub-objective 1.3 (Rational designation and use of land, taking into account biodiversity conservation and the impact of Disasters)
[51] De Overheid, vrijdag 21 april 2013, jaargang 03 nr. 86 [government e-magazine]

4. Planning and research: this unit is doing research on the possible threats of upcoming disasters; they also implement information sessions with vulnerable communities so they can be prepared on how to handle before, during and after a disaster;
5. Legal: the unit is coordinating all legal affairs for the division. (Karijokromo,2011)

The mission of the NCCR is as follows:

The NCCR contributes to the development of a more resilient, self-conscious and therefore safer society, in which everybody takes up its responsibility. NCCR has a directing role to prevent crises and disasters and where needed mitigate them by means of policy development, coordination and control. Their effort contributes to increasing the achievements of organizations in the security chain (NCCR website, 2012).

The core tasks of the National Coordination Centre for Disaster Management are:

1. Monitor and analyze developments in society to identify possible disasters and crises;
2. Develop and establish comprehensive policy frameworks to prevent where possible crises and disasters, to make them manageable and if they occur to adequately coordinate and direct the consequences of crises and disasters and to reduce the material and immaterial damage as much as possible;
3. Provide/monitor the development, implementation, management and maintenance of coherent policies in the field of crisis and disaster management by responsible partners in security both inside and outside government;
4. Ensure an integrated approach to the protection of critical infrastructure;
5. Develop quality criteria and set standards in the field of crisis and disaster management, where necessary help and encourage the responsible partners in security;
6. Act as a coordinator and facilitator in crisis and disaster management of (impending) crises and disasters (NCCR website, 2012).

At the time of preparation of this report (August-November 2014), the NCCR was dealing with a current health crisis, and the threat of another one: the Chikungunya pandemic and the threat of Ebola. Observations on the ground seemed to indicate a severe shortage of staff (a total of 6 people), especially on a higher level of decision-making (3). Also the NCCR staff available seemed to be very much involved in implementation, leaving less time for coordination.

Data were hard to collect and the website shows information that is mostly outdated. It would be recommended to evaluate the staffing of NCCR compared to the tasks and responsibilities of the Center.

b) National Disaster Coordinators

The NCCR works with selected Ministries who have a designated Disaster Coordinator: these are the Ministry of Defense, the Ministry of Justice and Police, The Ministry of Agriculture, Husbandry & Fishery, and the Ministry of Health.

c) Incident Command System (ICS)

Based on the size of Suriname and the huge variety in population density, NCCR identifies enabling population at district and community level to be First Responders as the most efficient strategy. Therefore Suriname has adapted the Incident Command System (ICS)[52] as the strategy that best suits

[52] The Incident Command System (ICS) was developed in the 1970s in response to a series of large forest fires in Southern California. Today, it is used by several US organizations, the Forest and Structural Firefighters Corps of Australia and others.

its reality. It simply starts with the First Actor present. It is also used in Brazil and Guyana, and enables response to disasters but also to big accidents. (Slijngard, July 2014)

ICS features a flexible organization that can be used to respond to any type and size of incident. It is standardized to enable rapid incorporation of personnel and other resources from different institutions and geographic locations, into an effective and efficient common management structure. The aim of ICS is to have firefighters, police, Red Cross, health, emergency committees, Armed Forces and other groups working under the same system, using common terminology, with a defined organization ruled by standardized procedures.

As institutions apply these standardized procedures in response to everyday, small and easy to solve incidents, they improve their preparedness to work with the System in large magnitude incidents. ICS is based on principles that ensure *the rapid, coordinated and effective deployment of resources* and minimize alteration of the operational policies and procedures of each of the response institutions. When an incident requires efforts from several institutions, regardless of its magnitude or complexity or the number of participating institutions, coordinated work is necessary to ensure an effective response through the efficient and safe use of all resources. Coordinating the effective use of all available resources is not easy. It is necessary to have *prior agreements and to formalize a management and operation structure to provide direction, effectiveness and efficiency to the response*. The Incident Command System provides this structure.[53]

Several divisions of the national government (such as the Fire Brigade, the Police, the Army, the Coast Guard, Medical Centers, among others are responsible to support the first- response in case of a possible threat. The response should be coordinated and executed by the responsible services. In case the responsible services are overwhelmed, the coordination shall be done at a higher level. In first instance, this shall be done by the NCCR. In case the National Security is at stake, other measures shall be taken, as indicated in the Constitution.

d) Platform

The National Coordination Centre for Disaster Management (NCCR) has established a Platform for cooperation with governmental and non-governmental actors that are involved in disaster preparedness and mitigation policies in either vulnerable communities or in local companies or organizations. The Suriname Red Cross has been placed under the category of NGOs.

Contact with NGO counterparts is made through different umbrella organizations:

> *NGO Netwerkoverleg Suriname* (a network of diverse NGOs working in development); coordinated by Stichting Projekta, based in the capital;
> Vereniging van Inheemse Dorpshoofden in Suriname (VIDS); the Association of Indigenous Village Leaders, with a Bureau in the capital;
> Vereniging Saamaka Gezagsdragers (VSG); the Association of Traditional Authorities of the Saamaka tribe (Maroons); with a Bureau in the capital.

e) Private Sector

NCCR monitors compliance of international corporations and operations with international safety standards. For example, for airports the International Air Transport Association (IATA) safety guidelines are used, combined with security guidelines implied by the anti-terrorism unit.

[53] Abstract from Basic ICS Course

In case of a calamity with impact, corporations need to report this to NCCR. Although this is based on a gentlemen's agreement and not a legal requirement, NCCR finds compliance of actors satisfactory.

NCCR organizes an annual drill for airports and a drill every two years for harbors.

In cooperation with the Maritime Authorities Suriname (MAS) and the Coast Guard, NCCR is now working on a National Oil Spill Contingency Plan. The Committee for Regulating of the Gold Sector is working on a Plan to limit the use of mercury by small-scale gold miners. NCCR does not have an overview of all plans related to safety and security of people and their environment. The *Bureau voor Nationale Veiligheid* (BNV)/ Bureau for National Security, established in the Cabinet of the President in 2010, should take the lead in this. According to Colonel Slijngard the BNV should concentrate on making broad policy, while NCCR concentrates on preparedness, concept legislation, response coordination and recovery. BNV should also produce the National Strategic Safety Plan.[54]

f) Climate Change and Environment

The Ministry for Labour, Technology and Environment (ATM) used to have the lead responsibility for the preparation and coordination of environmental policy in Suriname, with the National Institute for Environment and Development in Suriname (NIMOS) as its technical working arm. The main tasks of the Ministry are the formulation of policies and legislative proposals and the coordination and monitoring of both national environmental policy and international agreements. ATM is thus responsible for the coordination of the activities of other ministries regarding the use of natural resources, biodiversity conservation, health, and regional development. [55] During the course of the current government, NIMOS has been drawn into the Cabinet of the President. In 2011, the government established the Climate Compatible Development Agency. This is now also a unit within the Cabinet of the President.

g) Health Services

The Ministry of Health is the ultimate responsible institution for the health care system in Suriname. It has three core institutions: the Ministry of Health's Central Office, the Inspectorate (Office of Health Inspection) and the Bureau of Public Health. Due to the uneven distribution of the population, health care services are more readily available in the coastal area. These services are operated by the Regional Health Services (RGD) and the Bureau of Public Health (BOG). In the rural interior primary healthcare is delegated to the Medical Mission (MZ). The BOG is the most important institution having to do with health promotion in Suriname. It plays an important role in public health policy design and offers a great variety of services including the Central Laboratory Services, the Division of Epidemiology and the Environmental Inspection Agency. (2nd communication 2013)

As mentioned earlier, primary healthcare in the rural coastal area is delegated to the Regional Health Services (RGD) and in the rural interior to the Medical Mission (MZ), but there is no decentralized emergency health system. In case of major health emergencies or accidents in the districts, the health services from the capital Paramaribo need to be activated.

h) Land use and Spatial Planning

As land use is crucial to disaster risk reduction, spatial planning is also discussed as part of the institutional framework. Spatial Planning is part of the tasks of the Ministry of Spatial Planning, Forest and Land Management (RGB). In an advisory report [56] commissioned by the Vice President), it was observed that in the policy of the previous years there was no policy for neither Spatial Planning nor

[54] Interview with Colonel J Slijngard, Head of NCCR, December 2014
[55] 2nd communication on Climate Change 2013
[56] Committee Restructuring the Ministry of Spatial Planning, Land and Forest Management, February 2011. Domain land for all Surinamese citizens; to a just emission of domain land. Cabinet of the Vice President

Forest Management. The Committee concludes that in the period 2005-2010 both departments were non-operational, without personnel, making the Ministry effectively only the Ministry of Land Management. The focus of the Ministry was entirely on the emission of state land (domain land) in land lease.

The Minister is entitled to grant or deny a request for a land lease title based on conflicting plans for development. Advice will be asked from the department of Land Inspection and the District Commissioner; also, depending on the nature of the request (what kind of business) expert advice will be sought.

The Committee emphasizes that the Department of Land Inspection only looks at the legal status of the land; not at the quality or natural function of the land. It therefore recommends the urgent operationalizing and strengthening (with experts) of the Department of Soil Mapping as this is a crucial division for both Spatial Planning as Land Management [p.92].

On the recently held first conference of the Management Institute for Land Registration and Land Information System (MI-GLIS) the lack of spatial planning policy was reiterated as a serious constraint. International consultants presented on possibilities to use advanced technologies to effectively make spatial data available and accessible. [57]

To make the *Planwet* operational two legal bodies would have to be established: The Planning Council and the Planning Coordination Committee. The National Planning Office would chair both bodies.[58]

Tasks for planning at this moment are attributed to different Ministries, with some overlap. This hampers effective coordination. National Planning, including Regional Planning, is the responsibility of the National Planning Office (SPS).[59] Regional planning should be based on the district plans formulated from the bottom-up, and processed by the Ministry of Regional Development. Spatial Planning, as indicated before, is the responsibility of the Ministry of RGB, together with the Ministry of Public Works.

The expertise on the quality of the soil and the natural function of the land should be available to the district level as well, in order to guide the District Commissioner and team in zoning of the territory.

i) Transport and Safety

The *Stichting Logistiek Onderwijs* (SLO) /Foundation Logistical Education consists of the domains Suriname Maritime Institute (SMI), Port Management, Aviation and Road Transport. The SMI is already in the phase of accreditation by the International Maritime Organization (IMO)[60]. This will ensure that their education and training courses and certification are in compliance with the International Convention on Standards of Training, Certification and Watch-keeping for Seafarers or STCW Code[61].

Port Management, Aviation and Road Transport are not yet operational.[62]

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[57] Sylvano Tjon-Ahin, Director MI-GLIS in his presentation "The position of MIGLIS in economic context". First MIGLIS Conference, October 2014

[58] Written interview with Clarence Sairras of the National Planning Office, November 2014

[59] SPS is a foundation formerly based in the Ministry of Planning and Development Cooperation; it is now incorporated in the Ministry of Home Affairs.

[60] IMO is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships

[61] Adoption: 7 July 1978; Entry into force: 28 April 1984; Major revisions in 1995 and 2010

[62] Interview Mr. A.E. Hoffman, Director of the Surinamese Maritime Institute (SMI), December 2014

SLO has recently (November 2014) organized an incidental five-day workshop for transporters (water, air and land) about safely transporting dangerous goods. It was indicated that this could be seen as a first step in achieving the same safety standards for transportation.[63]

5.3.2 National Plans and their Implementation

As mentioned previously, an overall National Strategic Safety Plan and a National Disaster Response Plan do not yet exist.

Suriname has however committed itself to effectively managing disaster risk in the face of a changing climate. The Development Plan (OP 2012-2016) articulates a clear need for adaptation measures along Suriname's low-lying coast, as well as a need for a cross-sectoral Climate Compatible Development Strategy. The OP also identifies the need to prioritize integrated management of the coastal zone.

A Climate Change Strategy, as well as a National Climate Change Action Plan (NCCAP) are being prepared. Both focus on the expected impacts and vulnerabilities resulting from climate change. The NCCAP stresses the importance of integrated coastal-zone management and spatial planning. (SNCCC 2013, p.66).

Although the government's development policy is based on an integrated approach towards economic, social and environmental sustainability, an integrated climate change policy is still missing. There are no laws that specifically address climate-change issues and commitments under the UNFCCC. The institutional environmental framework is currently unable to address implementation problems in an efficient way or to reduce climate-change risk. For example, there are no laws or regulations that support the protection of mangrove forests outside of established protected; there is no zoning of coastal areas and there are few restrictions in place on coastal development. Also, restrictions on resource use, such as dredging of sand/shell ridges, are very limited and not well enforced. Other challenges in addressing climate-change issues are a lack of staff and knowledge within specialized Ministries and frequent political changes, which result in case by case decisions without inter-institutional articulation (SNCCC 2013, p.67). Existing institutions and agencies need to be strengthened and cooperation among them needs to be intensified and improved (SNCCC 2013, p.68).

Suriname National Health Sector Plan 2011-2018

The Ministry of Health (MOH) produced the Suriname National Health Sector Plan in 2011. As a World Health Organization (WHO) Member State, Suriname should adhere to the International Health Regulations (IHR 2005) which came into force In June 2007. Member States had until June 2012 to build, strengthen and maintain the 13 capacities under these regulations. MOH observed in 2011 that much work had been done, but further strengthening was needed in the 8 core capacities: national legislation & policy, coordination, surveillance, response, preparedness, risk communication, laboratory, and human resource capacity for surveillance & response. Strengthening was also needed in the 5 capacities for potential hazards (infectious disease, zoonotic event, food safety event, chemical event, radiological & nuclear event) as well as for the capacity in the points of entries.

The Minister of Health of Suriname has also installed 3 committees to develop the necessary policies for the IHR and to monitor and guide implementation. These committees are:

Multi-sectoral Port Health Committee (installed in 2008); a subcommittee in 1 border district is installed in 2010, with main task to develop systems in relation to IHR on airport, seaport and ground crossings;
National Health Sector Disaster Committee (installed in 2008);

[63] Interview with Ms. Martina Amoksie, Coordinator (SLO)

National Health Disaster Commission with main task to develop policies on early detection, quick response & control and medical care in public health emergencies.

To strengthen the national disease surveillance, prevention, control and response systems 2 plans have been developed. These are:

IHR action plan for the strengthening of the Bureau of Public Health as National Focal Point IHR
Multi-sectoral work plan for the strengthening of core capacities at national and district level

Suriname has an active good working by-law and budgeted National Immunization Program (NIP). New legal mechanisms as set out in the Regulations are fully developed and upheld; Review of the outdated legislation on communicable diseases has taken place.

The Bureau of Public Health has been designated as the National IHR Focal Point. (MOH 2011, p. 43-44)

The Hospital Safety Index survey had been done for all 5 hospitals in Suriname to support them in their planning process. The objective is to keep the hospitals operating under all circumstances. It was remarked that awareness about Disaster Management needed to be raised to get more involvement and support from top management of some of the health institutes (p.59).

The Health Sector Plan mentioned the National Road Safety Plan[64] and the National Health Disaster Plan[65] among the plans currently operative in the country. No information could be retrieved on the status of implementation for this report.

[64] approved in 2010, developed by the National Road Safety Committee
[65] developed by the MOH with PAHO‟s assistance and signed by all stakeholders during World Health Day 2009

6. THE STATE OF DISASTER RISK IN THE COUNTRY

6.1 HISTORICAL DISASTER ANALYSIS

The documented disaster history of Suriname is defined by flooding as Table 4 shows[66]. Natural Disasters in Suriname for the period 1900 to 2012 sorted by the number of people killed and affected[67]

Table 4. Natural Disasters in Suriname for the period 1900 to 2012			
Natural Disaster	Date	No of people killed	No of people affected
Flood	August 1969	-	4,600
Flood	07/05/2006	3	25,000
Flood	01/06/2008	2	6,548
(EM-DAT: The OFDA/CRED International Disaster Database, 2011)			

The tribal communities in the interior of Suriname (Maroons and Amerindians) traditionally live alongside the rivers that flow from South to North. Every year in the major rain season, the Marowijne and Cottica River will flood; people traditionally know where to go (NCCR, 2014).

In May 2006 however, torrential rains caused flooding along a number of the larger rivers, including the Saramacca, Upper Suriname and Tapanahony River. Nearly 30,000 people, in more than 150 villages of the remote lowlands were impacted by the rising flood waters. The newly created National Coordination Centre for Disaster Management (NCCR) stated the situation was a medium intensity scenario with the primary concerns being those of water, sanitation, other health concerns such as malaria, continuation of school programs and considerable damages to infrastructure and telecommunications (IFRC, 2006).

From the last week of May into the first week of June 2008 constant rainfall increased with high peaks made the Marowijne and Tapanahony River flood their banks, and consequently the villages that lay along those riverbanks. The most affected areas, the Tapanahony, Lawa, upper Marowijne and Coeroeni, are in southern and eastern Suriname. Reports from the NCCR indicated that 30 per cent of the livestock, 65 per cent of crops and 90 per cent of the fishing industry were affected. (IFRC, 2010)

In 2006, the President of the Republic declared the area an emergency area, allowing for international assistance. In 2008 this did not happen, much to the dismay of people affected and their relatives living in the city. A network spontaneously formed [Hesi] that mobilized funds, goods and volunteers. Looking at the different definitions used to call a situation a disaster we observe the following:

According to UNISDR[68] A disaster is a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.

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[66] presented by NCCR on Stakeholders Meeting of June 4th 2012,

[67] Disaster information on the EM-DAT is entered if at least one of the following criteria is fulfilled:
- 10 or more people reported killed,
- 100 people reported affected,
- a call for international assistance, declaration of a state of emergency.

[68] UNISDR Terminology on Disaster Risk Reduction (2009)

NCCR[69] expands and adds that a disaster is an event causing a serious disruption of public safety, severely threatening or damaging life and health of many persons, the environment or large material interests; which demands a coordinated effort of services and organizations of different disciplines to eliminate the threat or mitigate the harmful consequences.

Suriname Red Cross[70] also adds several key elements to the definition: The event is relatively unexpected, with little or no prior warning or opportunity to prepare; Available personnel and emergency services may not be available during the initial stages of a disaster because of demands for their services.

We can also record the following technological disasters:

Table 5.Technological disasters recorded in Suriname

Technological Disaster	Date	Place	No of people killed
Plane crash	June 7th 1989	Zanderij Int. Airport	176
Plane crash	February 11th 2001	Nw. Jacobkondre	10
Plane crash	April 3, 2008	Benzdorp	19
Plane crash	May 15, 2010	Godo Olo	8

6.2 HAZARDS / THREATS

Definitions

A *natural hazard*[71] is defined as a natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage".

Natural hazards can be divided in *geological* (internal earth processes such as earthquakes and volcanic activity; and related geophysical processes such as landslides, surface collapses, and debris or mud flows) and *hydro-meteorological* (processes of atmospheric, hydrological or oceanographic nature, such as hurricanes, thunderstorms, coastal storms, floods, drought and heat waves) hazards. Hydro-meteorological conditions also can be a factor in other hazards such as landslides, wild-land fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances.

Manmade Hazards can be divided into Socio-natural hazards and Technological Hazard:

Socio-natural hazard: The phenomenon of increased occurrence of certain geophysical and hydro-meteorological hazard events, such as landslides, flooding, land subsidence and drought, that arise from the interaction of natural hazards with overexploited or degraded land and environmental resources. Thus, human activity is increasing the occurrence of certain hazards beyond their natural

[69] NCCR Website 2014
[70] CDRT guide; A handbook for community response to disasters, 2008
[71] UNISDR Terminology on Disaster Risk Reduction (2009)

probabilities. Evidence points to a growing disaster burden from such hazards. Socio-natural hazards can be reduced and avoided through wise management of land and environmental resources.

Technological hazard: A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities; for example industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills; but also armed conflicts and their consequences. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.

As the risk analysis of both Commewijne and Para will show, most hazards identified are the result of human activity. The report will first explore Commewijne in Natural (6.2.1) and Manmade Hazards (6.2.2).

The risk analysis is built on a triangulation of methods: the framework was based on desk review of relevant policy documents and scientific reports; the body was formed by interviews with authorities and actors at national, district and community level, specifically including civil society, gathering their opinions and priorities. The resulting draft of the Country document was then presented to a national consultation workshop [mid-November] to gather feedback and fill gaps.

6.2.1 COMMEWIJNE

The district of Commewijne (Figure 3.) measures a total of 2,353 km^2 and is divided into six (6) administrative ressorts. The capital of the district is *Nieuw Amsterdam*. **Error! Reference source not found.** shows the number of residents per ressort.

Figure 3.Map showing the six administrative ressorts of the District of Commewijne

Table 6. Statistics on the residents in the six administrative ressorts in the district of Commewijne (2012 Census)

	Number of residents	Male	Female
Meerzorg	12,405	6,411	5,994
Tamanredjo	6,601	3,387	3,214
Nieuw Amsterdam	5,650	3,026	2,624
Alkmaar	5,561	2,859	2,702
Margrita	756	417	339
Bakkie	447	242	205
Total	31,420	16,342	15,078

Census 2012 compilation of table 9.34 t/m table 9.39

Compared to the census in 2004, the population of Commewijne has grown from 24,649 to 31,420 (27.5%), almost three times the national population growth (9.9 %). The population density is 13.4 people per km^2.The population of the district is composed of different ethnic and cultural groups, with a majority of people of Hindustani and Javanese descent.

6.2.1.1 Natural Hazards Commewijne

a. Flooding from sea

As Figure 3. shows, the district of Commewijne forms the coastline with the Atlantic Ocean. As it lays relatively low compared to sea level, flooding from sea is the first obvious risk. The possible consequences of sea level rise are further discussed under man-made hazards / climate change. No occurrences of severe flooding are historically documented for the district of Commewijne.

b. Coastal erosion

Commewijne is part of the Northern estuarine zone, which encompasses mangrove forests, lagoons, and brackish as well as a freshwater swamps. This zone is very dynamic, with its ever moving mud banks and beaches and the associated erosion and accretion. (ATM 2013, p.74)

The mud banks move at an average rate of 1.5 km per year in western direction. This natural process of erosion and accretion does not however account for the continuous erosion of the entire shoreline of Suriname. This should be associated with the clearing of coastal forests to create agricultural areas. The First National Communication on Climate Change in 2005 states this erosion causes a permanent loss of land and an episodic flooding of immediate areas on an annual basis (NIMOS 2005, p. 51). This report also observes that dykes and dams established in Coronie, Nickerie and Commewijne suffer from weak construction and a lack of maintenance. When they are breached or overtopped (which happens occasionally) tidal floodings of saline water cause damage to agricultural areas and infrastructure such as roads and housing (NIMOS 2005, p. 52).

The movement of sand banks does however have a direct negative effect on tourism. Respondents remarked on the recent disappearance of beaches (e.g. *Dianastrand)* and the loss of tourism facilities on one of the sandbanks (*Braamspunt).*

c. Salination

The coastal erosion, as a result of both natural and manmade causes means the buffer against the influx of saltwater is also gone. This leads to salination of both soil and water, further impacting negatively on the livelihoods of fisherman (change of ecosystems), and on horticulture and agriculture. Inundation due to the ongoing agricultural and land reclamation activities will also result in subsidence of the coastal plain (NIMOS, 2005).

Both respondents and stakeholders at the consultation workshop had concerns about the sustainability of the choice that is made for an artificial dike (which is under construction at the moment of preparing this report). Environmental specialists emphasized the need to protect the mangrove; because of its natural protection against flooding, erosion and salination, and because of its function in the existing ecosystem. Engineers argued that mangrove can indeed slow the process down, but does not always protect adequately. That is why the choice has been made for an artificial dike. It was stated by respondents and confirmed at the workshop that an artificial dike could co-exist with mangrove if measures were taken to maintain the ecosystem that mangrove needs. This would include the right balance of salt and freshwater, but also the possibility for the mud to form sediment.

Commewijne has one single dike (*waker*) to stop the erosion. Habitation and construction did not leave space for a buffer of land with a sleeper dike behind it for extra security.[72] Participants at the stakeholders meeting commented the dike is no permanent solution either, as the dike in Nickerie is already affected by erosion.

[72] Mr. A. Amatali from the Ministry of Natural Resources, Waterloopkundige Afdeling, NCCR Workshop 21/11/2014

Internationally there tends to be more and more consensus on revaluing mangrove as the better coastal protection and provider of sustainable livelihood. Looking back on the decision process on the dike of Coronie (where there was strong resistance against the artificial dike from local residents) it seems as if the short term economic benefits (employment, sales of local shops) weighed heavier than the long term consequences. Stakeholders agree there needs to be ongoing education and awareness based on facts and figures to inform these decisions.

Additional manmade risks: At the workshop it was remarked that small husbandry (sheep and goats) further contribute to erosion as they eat the young mangrove. The risk of flooding and coastal erosion is further aggravated by project developers who first scrape away the humus layer of land (to sell), therewith making the parcels available for construction even lower.

It was furthermore reported that sand is being (illegally) excavated at sand banks. Stakeholders agree permits on excavation should be adapted and legislation enforced.

Extensive studies were done in 2003, 2006 and 2009 to prepare an Integrated Coastal Zone Management (ICZM) Plan. This plan should include criteria and guidelines to direct resources away from vulnerable to less vulnerable areas within the coast. It should also include priorities for use and management of maritime and coastal resources. The ICZM Plan was completed in 2010 specifically for this part of the country, but its implementation has not yet begun (SNCCC 2013).

At the workshop it was observed that *riverbank* erosion is a neglected threat. Although it is mentioned in the First National Communication on Climate Change (2005), no suggestions for intervention were recorded.

d. Severe winds *(rukwinden*)

NCCR has documented the occurrence of strong winds causing considerable damage. For Commewijne, this is a recurrent hazard, occurring in 2010, 2012, 2013 and 2014. Respondents from Nieuw Amsterdam stated that they are relatively safe because they have a lot of trees. It was confirmed at the workshop that indeed locations without trees were hit hardest.

Table 7. Overview of Occurrences of Severe Winds (rukwinden); NCCR 2014

Date Disaster	Type Disaster	Number affected	District
04.jan.2010	Rukwinden	37.00	Paramaribo, Commewijne
24.jun.2010	Rukwinden	11.00	Wanica
25.aug.2010	Rukwinden	9.00	Paramaribo
09.sep.2011	Rukwinden	31.00	Wanica
17.mei.2012	Rukwinden	17.00	Nickerie
31.mei.2012	Rukwinden	24.00	Paramaribo
20.jun.2012	Rukwinden	211.00	Paramaribo, Wanica, Marowijne
18.feb.2013	Rukwinden	17.00	Brokopondo
02.sep.2013	Rukwinden	15.00	Paramaribo, Wanica, Commewijne

06.jul.2014	Rukwinden	- Nickerie, Coronie, Saramacca, Commewijne

6.2.1.2 Anthropogenic / Manmade Hazards Commewijne

a. Inundation

Inundation in Commewijne is related to geographical conditions (really close to the ocean and really flat); but more so to human activity. In industrial activity (for example attempted oil drilling by Staatsolie) historical canals and waterways have not always been conserved.

Bad maintenance of drainages and waterworks also plays a major role. This is caused partly by shared/conflicting responsibilities between different Ministries: Public Works (OW), Regional Development (RO), Natural Resources (NH) and the Ministry of Agriculture, Fishery and Husbandry (LVV).

Figure 4 1juni 2014. 'Inhabitants south of Sinabo complain about the damage the flooding had done to their crops. Citizens Information Center (BIC) Commewijne FB page

b. Limited access to improved water sources

When comparing household research done in 2006 and 2010 [GOS/UNICEF Multi Cluster Indicator Survey 2006 and 2012], an overall improvement can be seen in the access to improved drinking water sources (Table *8*).[73]

Table 8. Access to improved water sources in percentage	MICS 2006	MICS 2010
National average	91.7	95.0
Urban coastal areas	97.1	98.6
Rural coastal areas	97.9	95.9
Rural interior	44.8	70.7

However, further details show that in 2006 only 25 % of households using improved water sources in Commewijne (only a part of Meerzorg and a part of Nieuw Amsterdam)[74] and Marowijne were connected to a piped water system (GOS/UNICEF 2006). Because of salination, for the most part of the district, the groundwater is too salt (brackish) to be used. In 2006, 52.8 % of the households in Commewijne and Marowijne used rainwater. In 2010, a further segregation of data shows 66.7 % of households in Commewijne against 30.7 % in Marowijne have collected rainwater as an improved drinking water source. This does however not suffice in the dry season. The Ministry of Natural Resources (NH) distributes water with water tanker-trucks. Since these are filled with tap-water from Paramaribo this can also be considered to be an improved source.

[73] An improved drinking water source is defined as such based on the types of technology and levels of service that increase the likelihood of access to safe drinking water: piped water, public tap/standpipe, tube well/borehole, protected well, protected spring and rainwater collection.

[74] Details from interview with Environmental and Health Services Commewijne

Figure 5.Commewijne District

The Facebook page of the *Burger Informatie Centrum* (BIC)/Citizens Information Center of Commewijne shows several complaints about water distribution (by truck), as the quantity is not meeting the need; citizens and even staff at the District Commissariat complain that the distribution is arbitrary[75].

Suriname Red Cross (SRK) indicates that in 2013 there was a draught of 6 months and people on the right bank of the Commewijne River (only reachable by small boat) were completely out of water. SRK was able to provide one community[76] with extra water tanks. They indicate this intervention should be repeated on a large scale to assist other communities as well.[77]

The scarcity of clean water implies multiple health issues. Drinking from creeks and uncovered water reservoirs increases the risk on all kinds of water-related diseases (cholera, diarrhea, but also dengue and chikungunya). Furthermore there is a hygiene issue; if water is scarce, people tend to save water on hand-washing, personal and household hygiene. It should be noted that *warungs* (small restaurants making a large contribution to the economy of the district) are reported to use rainwater.[78] Criteria for the proper collection and storage of rainwater are available in printed material, but do not seem to be known widely[79].

The graphs from reported cases of gastroenteritis or diarrhea in under-5 year olds (Figure 6) and of reported cases in 5 year olds and older (Figure 7*Figure 14*) shows correspondence with precipitation, going up into the dry season (peaks in October and January) and decreasing with the rainy season.

[75] Interviews in November 2014
[76] The community of Johanna Margaretha on the right border of the Commewijne River where SRK was implementing a Community Disaster Response Training; durotanks funded out of DVID project
[77] Interview Humphrey Blinker, Disaster Management Officer SRK
[78] Focus group with Department Environmental Inspection.
[79] Materials have been produced in projects initiated by SRK, the Bureau for Public Health in cooperation with PAHO and UNICEF and CELOS.

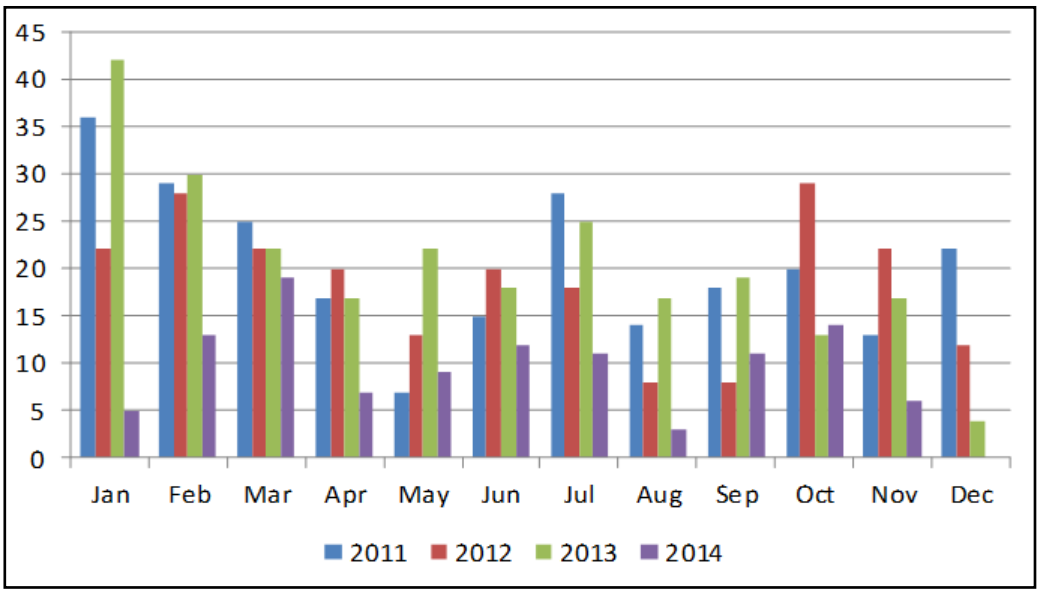

Figure 6. Total cases of Gastroenteritis (diarrhea) in <5 years by month; Commewijne 2011-2014

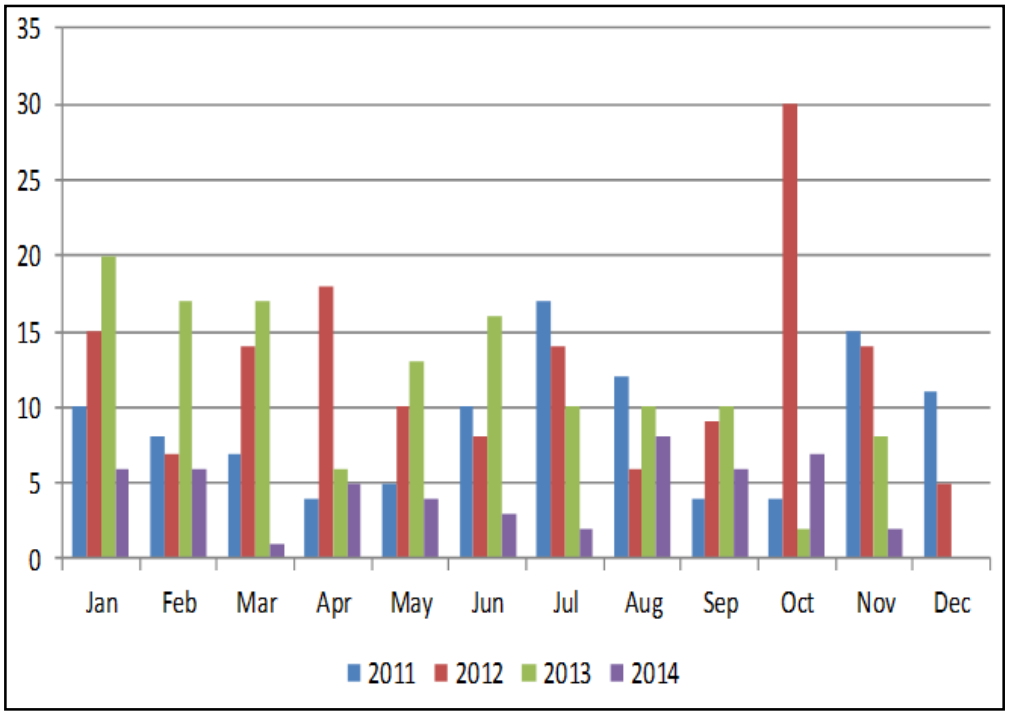

Figure 7. Total cases of Gastroenteritis (diarrhea in >= 5 years by month), Commewijne 2011-2014

The Ministries of Public Works (OW) and Natural Resources (NH) are currently working on a solution that would involve filtering surface water. Stakeholders at the workshop expressed concern about the vulnerability of surface water to contamination with chemical, physical and radiological contaminants. Furthermore, environmental experts warn about mercury contamination from distant mining activities[80] and urge for more research on this.[81]

[80] Concern based on previous research in pristine areas [Ouboter, P. E. et al, June 2012]
[81] Interview Center for Environmental Research, ADEK University

Apart from health risks, the lack of freshwater also has a grave impact on livelihoods of people, as agriculture, horticulture, small husbandry and fishery form a substantial part of the economy of Commewijne.

c. Chemicals

Storage of chemical waste

Commewijne used to host the sugar industry of Marienburg. The factory has been closed since 1986, but different chemicals, including pesticides were still stored in different stockrooms. Part of those chemicals are now packaged and stored at Peperpot; another part of the chemicals have been packaged and transported to the public landfill of Ornamibo in the district of Wanica. Experts state the transported chemicals should be destroyed, since there is danger of leakage, polluting soil and water. The soil of the entire area of Marienburg and all stockrooms should be analyzed to conclude the level of pollution and the recommended course of action.[82]

Processing medical waste

Figure 8. Situation at the Wanica ReComSur plant on November 15, 2013.

To ensure the responsible and environment-friendly processing of medical waste, the Ministry of Health signed agreements with Recycling Company Suriname (ReComSur) in February 2011. The Company was leased a truck by the Ministry to collect the medical waste and incinerate it at their plant in the district of Saramacca. In July 2012, an additional agreement was signed in which the Ministry leased an incinerator to RecomSur[83]. According to reports by the Pan American Health Organization (PAHO) previously medical waste was dumped on public landfills. Since the agreement with the Ministry in 2012, ReComSur started operating the incinerator on another location: in a populated area of the district of Wanica, leading to complaints by alarmed residents about a nauseating thick black fog. In November 2012 the Districts Commissioner of Wanica orders ReComSur to stop their operations, as the company never received a permit. By March 2013 residents indicate ReComSur had continued collection operations, resulting in over 20.000 kg of medical waste lying inappropriately stored in in the open air. In June 2013 Colonel Slijngard of the NCCR voiced his urgent concern after visiting the site. Consultations were held with relevant institutions but this did not lead to an agreed solution. [84]

In September 2013 the Director of ReComSur announced through the media that a processing plant for medical waste would be established in the district of Commewijne, expected to be operational in the first quarter of 2014. According to ReComSur, the plant would use a process which neutralizes and disperses the waste, and does not involve incineration. Questions of alarmed residents about the exact location were not answered[85].

The Minister of Health declared recently that ReComSur has not been processing medical waste for the Ministry over the last year and that the cooperation with ReComSur needs evaluation. In the

[82] Interview with Alies van Sauers-Muller, Disaster Coordinator Ministry of LVV, December 2014
[83] Financed out of the IDB loan for Public Health Sector Reform
[84] Picture taken by Ricky W. Stutgard, Professor and Head of the Veterinary Laboratory at the ADEK University
[85] De Ware Tijd September 2013, interview with Director ReComSur Humphrey Bergraaf

meantime, services of 3 other incinerators are used (2 in Paramaribo, 1 in Nickerie).[86] Upon the writing of this report, it was not yet clear whether there will be a plant in Commewijne, where it will be located and what process it would use to discard of the medical waste.

In a focus group discussion with the Department for Environmental Inspection of the BOG, the inspectors indicated that as a controlling authority, they are neither equipped nor trained as yet to control facilities of this nature[87].

Use of pesticides

Respondents and stakeholders expressed concern about the extensive use of pesticides in agriculture.

It is observed that in recent years, maintenance of public green spaces is also including spraying with pesticides. Spraying is also used to control weed on river and creek sides, and quickly clean out ditches. This is a grave concern as the pesticides enter the water, impacting soil and water. As pesticides kill the weeds, the roots do not maintain the soil and river and creek sides erode quicker; therewith clogging the waterways. The spraying thus has a counterproductive effect.[88]

In 2011 the Ministry of Labor, Technology and Environment (ATM) stated that the lack of policy and a regulatory base for chemical management, resulted in poor data collection. The only substantial data regarded the import and export of chemicals, showing an average increase from 2006-2009. With the ratification of Basel and Stockholm Conventions, it was expected that data collection and analysis would have a more technical and scientific nature in the near future. (ATM 2011; p.5)

In 2014, statistics available for pesticides still relate to general imports. The Ministry of Agriculture, Husbandry and Fishery (LVV) is however in the process of collecting specific data on pesticide use in agriculture.

The Ministries of LVV, Regional Development (RO) and Public Works (OW) work together to make people aware of the damaging impact of weed-killers on the quality of the water, the health of the people spraying, and the environment. Apart from raising awareness, alternatives are provided.

There are no national data available on the impact on health of pesticides. There are some data on the impact on the environment, but they do not include pesticides recently on the market; the most recent study available dates back to 1992. The Ministry of LVV is in the process of having new studies done.

Strategically, the Ministry searches first for alternatives before banning a product. As soon as there is a better method or less toxic product, the old one gets banned. This is an ongoing process. Training is targeted to direct users, but awareness raising is needed for policy makers and the general public as well.[89]

6.2.2 PARA

The district of Para is divided in (5) administrative ressorts as shown on the map from left to right: Bigi Poika, North Para and South Para, East Para and Carolina. The capital of the district is *Onverwacht* in the ressort Para Zuid. The District Commissariat and most other services are centralized here.

[86] De Ware Tijd, December 16, 2014. Interview with the Minister of Health, Michel Blokland
[87] Focus group with the Department of Environmental Inspection, October 2014
[88] Stakeholders workshop
[89] Written interview with Ms. Alies van Sauers, Disaster Coordinator Ministry LVV

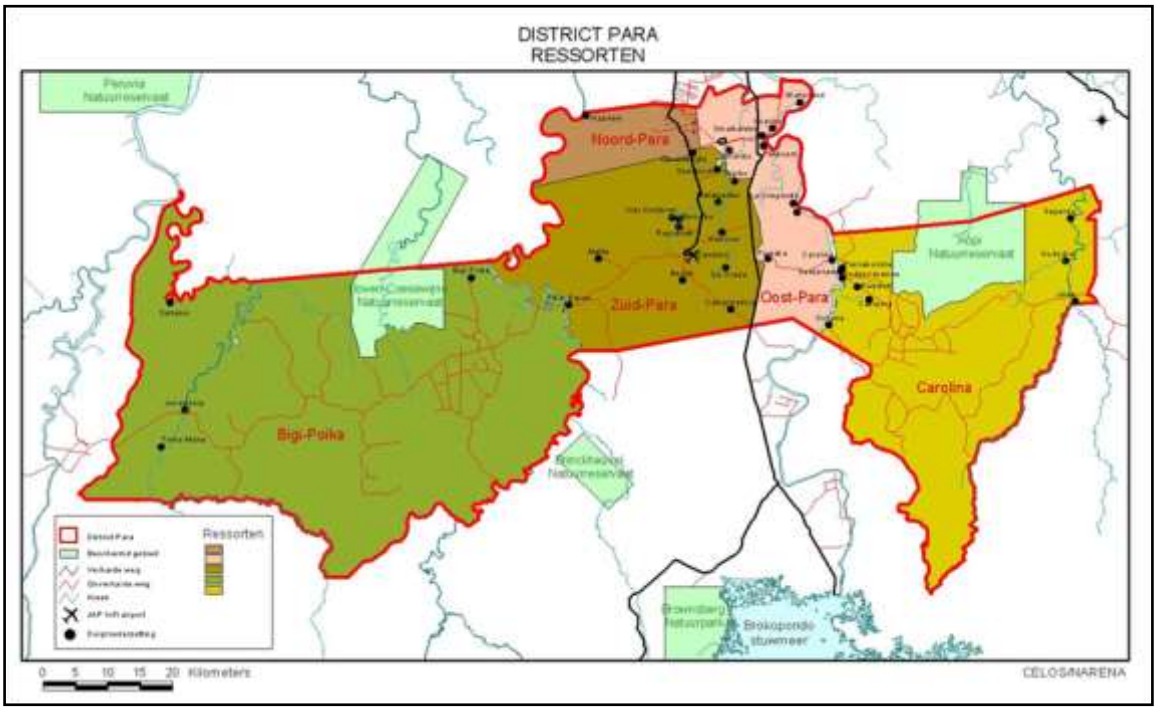

Figure 9. District of Para with its five administratieve ressorten

As the following table shows, there is an enormous difference in population density. This brings along challenges to reach the most remote communities with different services.

Table 9. Area of ressorts, number of residents and population density for 2012

Ressort	Surface (km^2)	Number of residents 2005	Population Density 2005	Census 2012 total	Census 2012 male	Census 2012 female
Para Noord	236	5,887	24.9	9,703	4,781	4,922
Para Oost	446	7,617	17.1	8,016	4,093	3,923
Para Zuid	909	5,607	6.2	6,113	3,186	2,927
Bigi Poika	2.361	395	0.2	525	346	179
Carolina	1.441	324	0.2	343	183	160
Total	5.393	19, 830	3.7	24,700	12,589	12,111

Source: combined Statistics General Bureau of Statistics (2005 and Census 2012 table 9.46 to 9.50)

Statistics show a steady population growth from 16,255 in 2001 to 19,830 in December 2005. Total population of Para thus is less than 5 % of the national population.[90] From the Census in 2004 to the Census in 2012 the population of Para grew from 18,749 to 24,700. This growth of 31.7% is more than thrice the national population growth (9.9%).

[90] Districtsplan Para voor Dienstjaar 2013; p. 9

6.2.2.1 Natural Hazards for the district of Para

River Erosion

For the district of Para, for the region Onverdacht [*Onoribo*] until Highway strong underground currents cause instability of land, and the riverbanks of the Para River also are subject to erosion.

According to respondents from *Osembo*, senior citizens would warn not to build along *Meursweg*, as it is not safe. The road (including a bridge over the Para River) had collapsed approximately 15 years ago. Since then, expanded construction has taken place. Adding up to the risk, in the rainy season the Meursweg floods. As it connects East with North and South Para, it immediately impacts access to school for children from the other resorts; as access to all other services for all residents.

6.2.2.2 Anthropogenic / Manmade Hazards

a. Road safety

In the geography and economy of Suriname, both Para and Commewijne can be categorized as in-transit or in-between districts. The *Oostwestverbinding* is the main road that connects all the coastal districts of Suriname. It runs from the border with French Guyana in the East through Marowijne and Commewijne to Paramaribo, and continues on from the capital of Paramaribo to Saramacca, Coronie and Nickerie to the border with Guyana in the West.

In Para, one narrow main road connects the capital Paramaribo (through the district of Wanica) to the international airport. This same road connects to the Afobakkaweg, which leads further down South to the district of Brokopondo, where much of wood logging and mining industry takes place: gold, granite and sand. The Afobakkaweg is the only connection to *Atjoni* (even further down South in the district of Sipaliwini), where transport by road ends and transport by river (up or down the Suriname River) begins.

From Lelydorp (Wanica) to the airport (Para) the road has no pedestrian or bicycle path and is occupied on both sides with residential and commercial buildings (a distance of 30 km).

There is regular and extensive transport of fuel for industries and for individual small-scale miners (*poknokkers*) over the road. Additionally, there is a monthly distribution of fuel by the Ministry of Regional Development (RO) to remote communities who depend on diesel power generators for electricity.

There is no documentation available on transport of other chemicals for industries in Para, Brokopondo, Sipaliwini.

Figure 10. Fuel truck on the Afobakka Road

Products from mining and other industries are transported from Sipaliwini, Brokopondo and Para back to the capital. This involves heavy trucks loaded with sand, granite, and wood logs.

A deep concern is shared by respondents in and outside of Para, and stakeholders at the workshop alike at the lack of regulation, conditions and criteria for road transportation. It is observed there are ***no weigh bridges*** for containers, not even in the International Seaport of Paramaribo. There is also no distribution center close by where heavy containers could be repacked in smaller units.

This means it is not possible to check whether the trailer to transport goods suffices: does it have enough axes, does the inspection certificate state it can carry this weight. This also means neither the driver, nor the police is able to tell whether the vehicle is appropriate for the weight, nor whether that vehicle is allowed to use roads and bridges with a weight limit. Carrying heavy loads on inappropriate roads and/or inappropriate trailers seriously increases the risk of tilting and potential consequences thereof, such as traffic accidents, cargo spills and road blockage. Stakeholders at the workshop reported numerous cases of tilted trucks. A quick media scan results in alarming fact and figures as shown in **Error! Reference source not found.** below.

Table 10. Accidents involving tilted trucks media scan 2015

Date and Medium	Accidents with tilted trucks
January 11, 2012 Suriname Nieuws	A truck with concrete of Subema N.V. tilts on Monday evening in the middle of the entertainment area in Paramaribo, damaging a main water pipe, causing the whole area to flood.
July 7, 2012 Obsession Magazine	A truck with 16,000 liters of nitric acid of Haukes N.V. on its way to Rosebel Goldmines, tilted on Brownsweg. NIMOS was asked for assistance.
July 11, 2012 GFC Nieuws	A truck with sand and asphalt of Dalian tilted in a ditch because of a subsidence in the road (Paramaribo).
March 22, 2013 De Ware Tijd	A truck of Fernandes tilted at the Tawajaripolderweg, police needed to reroute traffic.
January 23, 2014 Starnieuws	An oil truck of Boedhoe tilted at the bottom of the Wijdenbosch bridge[91], spilling oil on the road and causing hours of traffic jam on both sides of the bridge.

Another concern is there are ***no criteria for drivers of dangerous goods***. To compare: For seafarers, the module on safety with the Maritime Institute includes Personal safety and social responsibility; Fire prevention and firefighting; and Elementary first aid. In other words, for transport of dangerous goods per sea, the transporter knows what he/she is transporting and how dangerous it is; and how to act in case of a calamity. It can be suspected that, for transport of dangerous goods per road, the driver does not possess this knowledge and skills. It can also be suspected that drivers are not trained to read the bill of lading; it can also be suspected that the average police officer is not trained to read a bill of lading.[92]

Legislation is still lacking. The National Chemical Profile of 2011 identifies NIMOS guidelines on Petroleum Products and Industrial Chemicals as part of the legal instruments that regulate each stage of chemicals from import and production to disposal, for each of the main use categories of chemicals (ATM 2011; p.54).

However, the Framework Legislation on Environmental Management (prepared by the Ministry of ATM in 2011) that would elevate NIMOS to the National Environmental Authority has still not been approved. Multinational corporations do adhere to the guidelines since their safety protocols are thought to be in line with international conventions; for local industry however, it is hard to say.[93]

[91] The Wijdenbosch bridge connects the district of Commewijne with Paramaribo
[92] Interview Mr. A.E. Hoffman, Director of the Surinamese Maritime Institute (SMI), December 2014
[93] Interview with Mr. Wensley Ellis, lawyer at the Environmental Department ATM

Furthermore, ***enforcement of legislation*** is generally a problem in Suriname; and for chemicals management specifically. Among the factors that have been identified as limitations to enforcement are financial constraints, lack of appropriate monitoring tools and equipment, unqualified personnel, inadequate penalty provisions, slow judicial process and lack of institutional co-operation. Non–legally binding instruments such as guidelines are of fairly recent origin, and are not used in a consistent and systematic manner. Consequently, legislation has yet to catch up with individuals and industry. (ATM 2011; p. 56-57)

Stakeholders at the workshop full-heartedly agreed with this analysis.

An additional concern is the difficult access to a calamity for emergency services; and the absence of evacuation routes or routes to transport victims away from the calamity. With today's social media, it should be feared that news of a calamity would have the narrow road blocked with traffic within no time.

b. International Airport

The JAP International Airport meets the safety criteria of the Civil Aviation Safety Authorities Suriname (CASAS) and is monitored regularly by the Transportation Security Administration (TSA)[94].

Respondents voiced concern about *existing villages (and new concessions) under the flight routes*: Hollandse Kamp, Matta, and Wit Santie. In case of a plane crash, these communities are extremely vulnerable.

The airport has one way in and one way out. As shown in *Figure 11, the way out leads traffic within meters reach of the mass storage of aviation fuel*. At the workshop the quality manager for the airport, Mr. Praag, indicated that the Ministry of Transport, Communication and Tourism (TCT), together with Fuel Company SOL is working on a solution where an alternative road will be constructed[95] and the existing road will be closed. Relocation of the tanks would be an enormous investment. Other stakeholders suggest more research on extra security guidelines for aviation fuel storage, with involvement of relevant institutions such as the International Civil Aviation Organization (ICAO).

Figure 11. Mass storage of aviation fuel along the way out of the airport

Airports with international travelers always carry the risk of *import of viruses or other micro-organisms*. Suriname has experienced this with the Avian Flu (2010/11) and recently with Chikungunya (2014). On October 1th 2014, the President of Suriname announced in Parliament to have requested assistance from both PAHO and befriended nations (Brazil, France, USA and Cuba amongst others) to prevent the Ebola-virus from entering the country**.**[96] The risk of imported viruses or other micro-organisms will be further discussed under 6.2.5 (Emergencies affecting Public Health and Safety).

[94] Agency of the US Department for Homeland Security, with jurisdiction over transportation systems inside, and connecting to the United States of America

[95] The alternative road will be via Wit Santie

[96] De Ware Tijd, daily news. October 1, 2014

c. Inundation

Some former plantations are confronted with some inundation in the rainy season annually. In 2009/2010 however, plantations were severely flooded. There were also reports from North Para and Matta (Savannah). Although not qualified officially as a disaster, people did experience it as such: *"People had to be evacuated and had to stay in the cultural center in Lelydorp[97]; they lost all kinds of assets, mattresses, clothing, electrical appliances; cattle drowned, harvests spoiled; for us it was a real disaster".* (Ms. Meredith Pique, District Secretary)

In 2013, only plantation Osembo reported flooding. Several respondents expressed concerns about the current trend of using swampland for construction; swamps are natural water storages and more and more are filled up, enhancing the risk of inundation.

d. Sanitation

Respondents from plantations in Para (North, South and East) are worried about sanitation not meeting safety criteria. In recent years, more and more affluent people have holiday houses built in Para, close to the creeks. According to Plantation Administration (PA) members, criteria for sanitation should be in the contract and the Ministry of Public Works (OW) should monitor this. [98] The Bureau of Public Health (BOG) indicates an agreement with the PA's to send people to BOG to obtain the instructions for septic tanks (rectangular, made from ferroconcrete). There is a discrepancy however between the instructions by BOG, and the criteria legally implied by the Ministry of Public Works (OW).[99] At the workshop staff of the Ministry of OW confirmed research[100] proved the criteria used in Construction Legislation (cylinder septic tank) are outdated and should be brought up to par with those used by BOG.

Residents also indicated the drainage system is in bad condition, causing 'grey water' to go straight into creeks.

It should be reiterated that the Act on Construction is limited to the area of the city of Paramaribo and therefore not applicable in Para (or any other rural district). There is a specific Ordonnance for rural areas that outlaws latrines close to water sources. This is not very well known[101].

According to the District Plan of 2013[102], out of the 11 Indigenous communities in Para, only 3 were indicated to have access to running water. Most communities in the 'outer' ressorts of Bigi Poika and Carolina are depending on either rainwater or water from unprotected wells. In recent years, the Commissariat together with the *Dienst Water Voorziening* (DWV)/ Water Supply Services is aiming to provide piped water to all. Most remote communities use pit latrines (both improved and unimproved) for sanitation.[103]

Case study of Powakka

The village of Powakka, in the south of ressort East Para, has its own well. DWV is establishing a water system to connect households to the well through yard taps. There are still quite some households who retrieve water from unprotected wells. Less than half of the people have a flush toilet, the other

[97] Capital of the neighboring district Wanica
[98] Interview Elviera Sandie of La Prosperité
[99] Focus group Department Environmental Inspection of BOG
[100] Research in the context of the Water Master Plan for Paramaribo (IDB)
[101] Anchillostoom verordening, mentioned by BOG
[102] For Para, the District Plan of 2014 was not available at the District Commissariat
[103] Improved sanitation facilities hygienically separate human excreta from human contact: flush or pour flush to a piped sewer system, septic tank or pit latrine; ventilated improved pit latrine, pit latrine with slab, and use of a composting toilet.

people are still using latrines. A random sample shows villagers are not aware of the appropriate placing and distance for latrines in relation to water sources to safeguard the quality of drinking water. There is a lot of construction going on, partly by people who receive assistance from the Low Income Shelter Programme (LISP), and partly by people who are building their house independently. LISP is instructing the rectangular septic tank of ferroconcrete and some people are imitating this model. It is not the rule however.

Inadequate disposal of human excreta is associated with a range of diseases, including diarrheal diseases and polio. National statistics show an improvement in access to improved sanitation facilities.

Table 11. National statistics on the improvement in access to improved sanitation facilities

Access to improved sanitation facilities in %	MICS 2006	MICS 2010
National average	89.8	91.0
Urban coastal areas	97.9	97.8
Rural coastal areas	91.6	94.1
Rural interior	33.0	41.5

Further details for Para and Wanica show within their overall percentage (94.9%) for 2006, 73.4% had a septic tank and 20.9% a pit latrine.[104] In 2010, segregated data for Para show within their overall percentage (91.6%), 43.6% had a septic tank and 46.9% a pit latrine.[105] It is important to state that in the case of sanitation, even a small percentage of people using unimproved sanitation facilities (open pit or open defecation) can be a health risk to the entire community. Sanitation facilities not properly constructed and/or placed too close or upstream of water sources also form al health risk.

[104] Out of 94.9%, the other 0.6% flushes to a piped sewer system
[105] Out of 91.6%, the other 1.1 % flushes to a piped sewer system

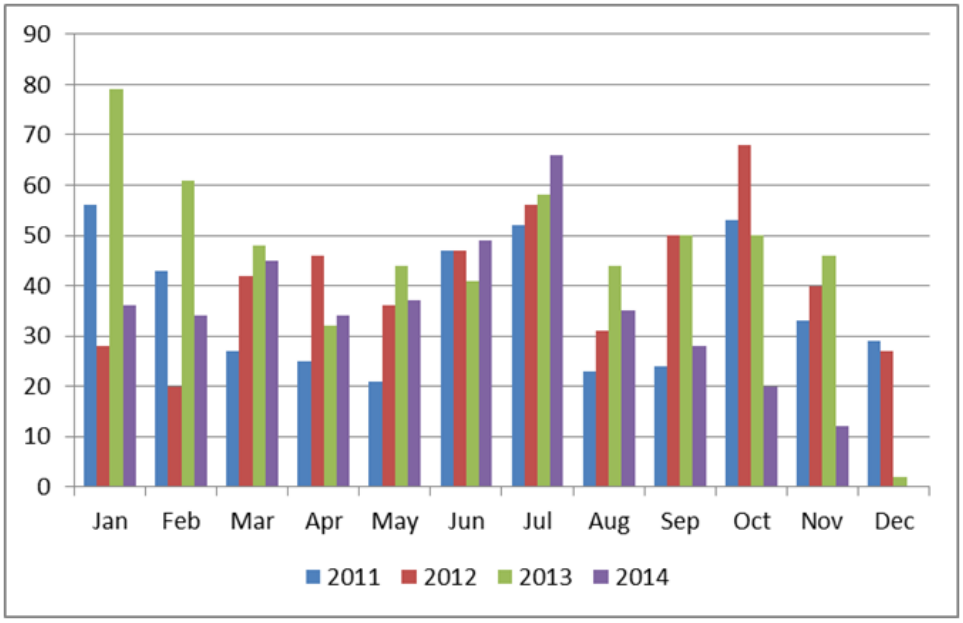

Figure 13. Gastroenteritis in < 5 years by month. Para. Years 2011-2014.

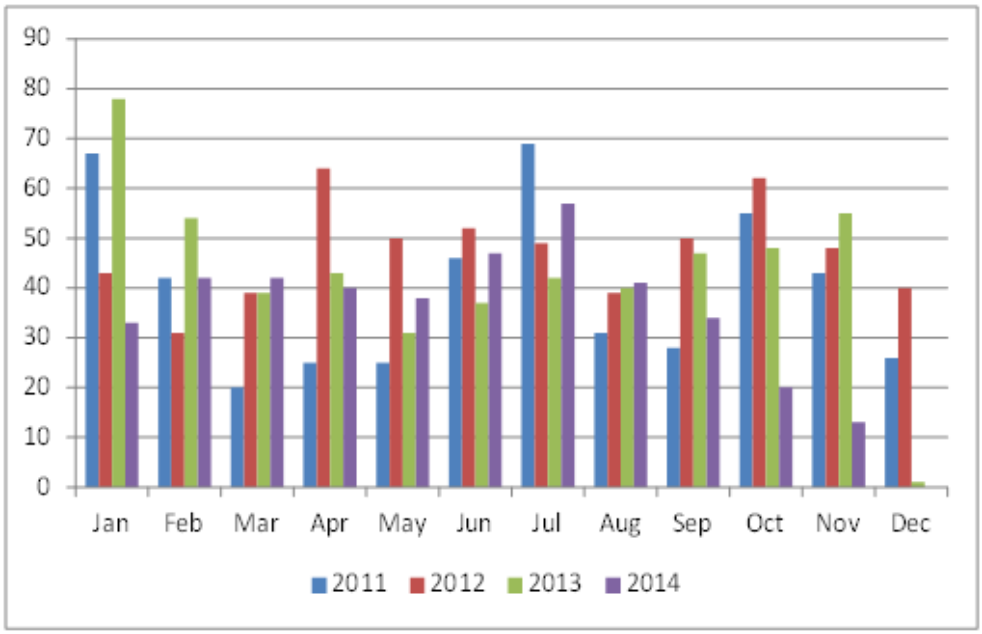

Figure 14. Gastroenteritis in >= 5 years by month. Para. Telefonade. Years 2011-2014

In urban areas, septic tanks are emptied by private companies; the fecal waste is collected by truck and disposed of in the Suriname River (MOH, 2011; p.146). For rural areas, it is not clear whether they have access to this service; and what would be the alternative if not.

An IDB financed Sanitation Sector Strategic Plan for Suriname has been prepared in 2009/2010 to identify steps for future improvements. Future operations would address the challenges in the rural areas and in the wastewater management, thus making use of the completed Master Plan and of the results of the Sanitation Sector.[106]

[106] IDB August 26 2010. SURINAME Water Supply Infrastructure Rehabilitation SU-L1018

If we compare total cases of gastroenteritis of Para (left) with Commewijne (right), we see that the situation in Para is worse, both in absolute and in relative numbers (Commewijne 0.5% versus Para 3.3%). The numbers for the Medical Mission posts (primary healthcare provider for the rural interior) in the Indigenous villages Bigi Poika, Powakka, Pikien Saron and Redi Doti have not been included.

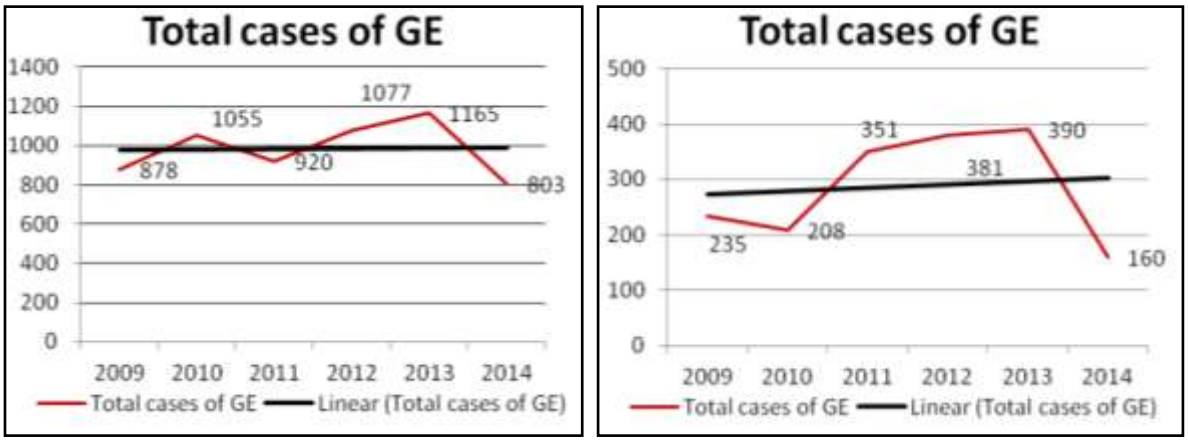

Figure 15. a and b. Source: telefonade Regional Health Services (RGD) policlinics, Department for Epidemiology (Bureau for Public Health)

Droughts

Droughts combined with carelessness often lead to grass fires. Draught in combination with a lack of improved drinking water sources leads to health risk, as people resort to using surface water from the creeks. Severe droughts combined with water mismanagement leads to loss of livelihood. Plantation Administrations of Vierkinderen, Republiek, Coropinakreek and La Prosperite report a loss of income from tourism, as neighboring plantations and project developers divert water away from their recreational facilities.

Land Use

Contamination of soil and groundwater by Ornamibo landfill (Wanica)

In 2011 the Ministry of Health observed that, due to the limited capacities of waste management services in the regions Paramaribo and Wanica, only 70% of the estimated 70,000 tons of waste generated annually was collected; and in the other districts an estimate of 0 to 30% of the waste was collected and disposed of in open dumpsites. Illegal dumping or burning of household waste is mentioned as a recurrent phenomenon in residential and rural areas, as well as the tendency to dispose waste as a fill-up for the preparation of private properties land inward or nearby the Suriname River (MOH 2011; p. 146).

Both Commewijne and Para have improved remarkably on waste management. In Commewijne, waste is now collected by 2 contractors who transport it (over the bridge) to the public landfill *Ornamibo* in Wanica. In Para, yellow bags are sold to residents to pack the waste for collection by garbage trucks, and this is working very well. Combined with the grooming and planting of road sides, the district has become an example for the entire country.[107]

There is however still much to improve in waste management in general. The government-owned public landfill *Ornamibo* was created as a temporary solution to serve the Greater Paramaribo and

[107] Interviews with the Environment and Health Service (MGD) officers at the District Commissariat of Para and Commewijne

Wanica district area. There is no separation of chemical, toxic, organic or other waste and disposal is uncontrolled. The transformation to a controlled landfill is considered since 2002 (MOH, 2011; p.146).

As indicated before, pesticides (fungicides) from the old sugar industry in Commewijne have been transported to Ornamibo[108]. Environmental experts indicate a risk of contamination of groundwater as well as runoff contamination (in case of inundation) into the Para River. As the landfill is located in the neighboring district of Wanica, contamination could be defined for Para as a cross-border risk.

Uncontrolled Gold mining

Gold mining is a concern from a social, from a health, and from an environmental point of view. Socially, the discovery of gold relatively easy to extract (on the Greenstone Belt) has caused an influx of *poknokkers*. In other gold mining areas conflicts have more often resulted in violence. In Para, villagers of Matta have reported conflicts with outsiders entering their traditional territory. Experience in the neighboring district Brokopondo has also shown that when large concessions are given out to corporate industries, the small scale miners have to leave. The State Mineral & Mining Company (SMMC), better known as Grassalco, has obtained the right to explore for gold and other minerals in an area (26000 ha) west of the indigenous village of Bigi Poika. In that area many small miners (*poknokkers*) from neighboring villages (Kwakoegron, Bigi Poika, Pikin Saron, Sectie and Makka Kriki) are working gold. There are concerns about their future livelihoods and the possibility of conflict.

From an environmental and health point of view, Grassalco has stated in the media[109] it will not use mercury but will work with a system of gravity; no chemicals included. This would be a huge step forward compared to other large corporations such as IAMGOLD[110], who do not work with mercury but do use cyanide.

In artisanal gold production however, mercury is usually used for amalgamation of the gold, and it is estimated that for every kilogram of gold produced, 1 kg of mercury is lost to the environment (Veiga 1997). Mercury is a heavy metal that is toxic to many animals, especially vertebrates, including humans. Humans absorb mercury via the lungs by inhalation, via the gastrointestinal tract by ingestion (for example by eating contaminated fish or drinking contaminated water), through the skin and via the placenta into the fetus (Kaiser and Tölg, 1980). The developing fetus, infants and young children are the most vulnerable to the damage done by mercury and mercury related compounds. Methylated mercury, the form found in fishes higher up the food chain, affects the development of the brain and the central nervous system. Even at low levels of prenatal exposure, symptoms of neurological effects have been observed (Ouboter 2007). Mercury levels in hair from mothers from gold mining areas, delivering in a hospital in Paramaribo showed elevated Hg concentrations in about one third of the mothers; 80% of the newborns had a higher mercury level in hair than their mothers (Mohan, et al, 2005).

Of the mercury used in gold mining operations, approximately 55 % is lost to the atmosphere and 45 % is lost to streams (Pfeiffer and Lacerda 1988). In 1997 Veiga estimated at least 10,000–20,000 kg of mercury is released into the environment of Suriname by gold production annually. Follow up research measured mercury levels in sediment and predatory fish for 53 localities in Suriname in 2012. The average mercury level in bottom sediment surpassed the Canadian standard for sediment in most localities, except the coastal plains. Of the predatory fish, 41 % had a mercury level above the European Union standard for human consumption of 0.5 lg g-1. Highest mercury levels were found in fish from the Brokopondo Reservoir and from the Upper Coppename River. High levels of mercury in

[108] Interview with Alies van Sauers, Disaster Coordinator Ministry of LVV

[109] Interview with Sergio Akiemboto, CEO of Grassalco N.V. November 11, STVS [state television broadcasting]

[110] Canadian mining company operating in Gros Rosebel, Brokopondo (aquired Rosebel Gold Mine as part of Cambior in 2006)

fish in pristine areas are explained by atmospheric transportation of mercury with the northeastern trade winds followed by wet deposition (rain). Contrary to gold mining areas, where mercury is bound to drifting sediments, in ‘‘pristine’’ areas the mercury is freely available for bio-accumulation and uptake (Ouboter et al, 2012). [111]

Furthermore on environmental impact, measurements for turbidity in the gold mining sites show that the sediment load in the streams and rivers cause high levels for turbidity. These levels exceed international standards for turbidity in aquatic ecosystems and will negatively impact the biodiversity in these systems (Ouboter et al, 2007).

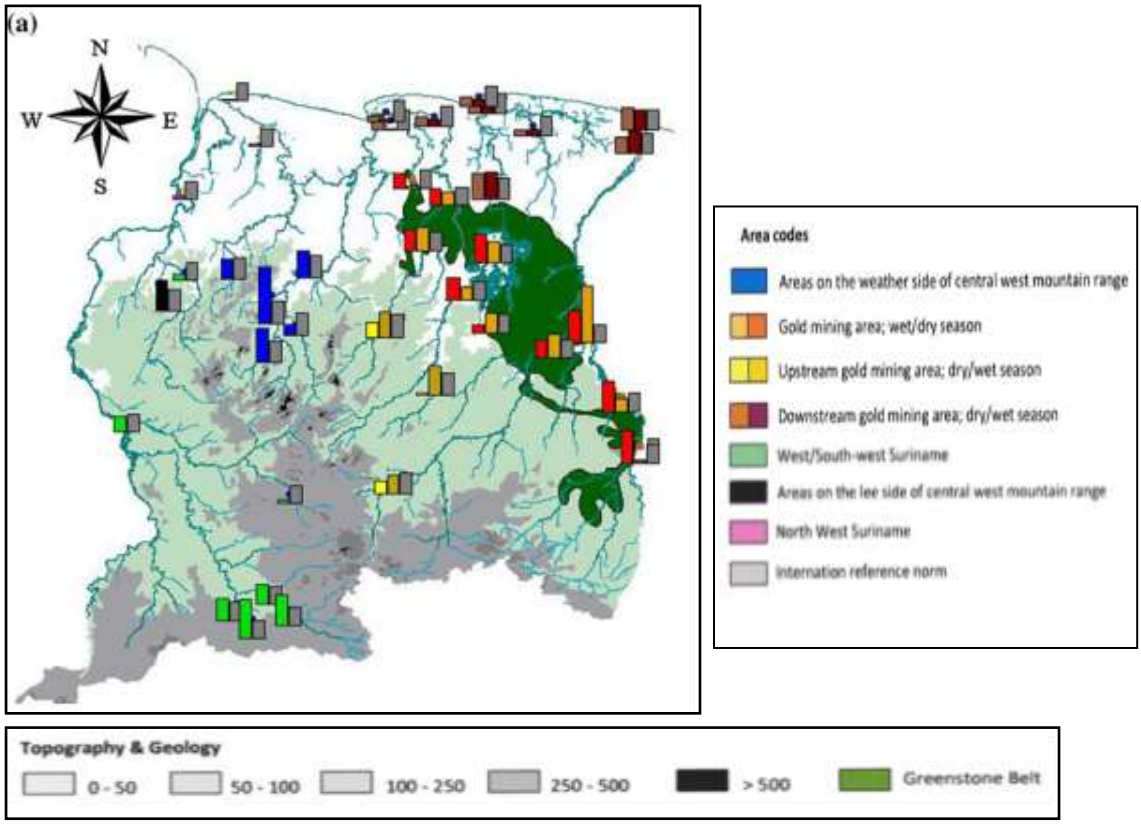

Figure 16. Gold Mining Areas in Suriname

Bauxite mining

Environmental experts have pointed out that, aside from small scale mining, *all forms of mining* contribute to the release of mercury from the earth crust into in the atmosphere. All large scale mining operations such as oil drilling by Staatsolie, gold mining by Rosebel Gold Mines and bauxite mining by Suralco contribute therefore to mercury emission. Operations have to be adjusted to minimize

[111] This paper combines the results of the different studies addressing the concern about mercury pollution over the past 2 decennia. It intends to give an overview of the mercury levels found in the main river systems in Suriname and to clarify these mercury levels in different parts of the country, especially explaining the high levels in pristine central and western Suriname.

emission and process the mercury released as a by-product in a safe manner.[112] In March 2013, Physics Professor and Engineer Dennis Wip from Anton de Kom University of Suriname (AdeKUS) presented research findings for the capital Paramaribo to the media. He indicated levels of 7,000 to 8,000 monogram[113] mercury emission per m^3, compared to the WHO norm of 1,000 monogram per m^3. The researcher emphasized the need for environmental legislation and the involvement of health and labor inspectors.[114] As indicated in Chapter 3, NIMOS has prepared a roadmap towards ratifying the Minamata Convention on Mercury (April 6, 2014).

The district of Para is home to the Suriname Aluminum Company [Suralco], mining and processing bauxite. Suralco has stopped mining activities in the Lelydorp II and III mine since February 2007. Since it is company policy to return rights of concession of areas that will not be mined anymore, closure and rehabilitation plans have been developed. For 4 different zones (lakes, nature areas, land in use for agriculture, commerce and residence, and the disturbed mining area) different potential destinations have been defined, varying from recreation to agriculture to sport facilities. After the closing activities, the chemical balance of the surface water, erosion of the soil and the recovery of vegetation will be monitored for 5 years, says a brochure published for the public[115].

Respondents in Para are concerned about the actual safety of using the former mining area. In interviews they express fear for instability of the land, and the possibility of chemical waste. They would like a second opinion from an objective institute; for example, the *Bauxiet Instituut* of Suriname.[116]

Quality of drinking water

Para holds the one aquifer providing the Suriname Water Company (SWM), which provides most of the coastal area with piped water. Although the source is very deep and thus relatively safe, respondents agree that the area should be legally protected (and monitored) to safeguard the quality of the water. Suriname does not disinfect the tap-water, as is common in most Caribbean countries. As mentioned when discussing sanitation, there are still communities depending on unprotected wells or surface water, making them extra vulnerable for all sorts of contamination.

Deforestation

The map shows wood logging (dominant green) as the main land use in Para (*Figure*). There is also *illegal* wood logging taking place in unused hinterland and disputed inheritance land where there is no monitoring.

[112] Presentations of Prof. D. Wip and Prof. P. Ouboter at the NIMOS seminar on the Minamata Convention on Mercury, March 2013

[113] 1,000 monogram is 1 microgram

[114] Starnieuws online, March 15, 2013

[115] Non-technical summary of the closure plan for the Lelydorp II and III mine. Suralco LLC and SRK Consulting

[116] The Bauxiet Instituut was established in 1981 to monitor the bauxite sector

Logically, the mining activities discussed before also contribute to deforestation. Respondents and stakeholders alike expressed their deep concern about the lack of guidelines for spatial planning, which leads to rather uncontrolled deforestation for, among others, construction purposes.

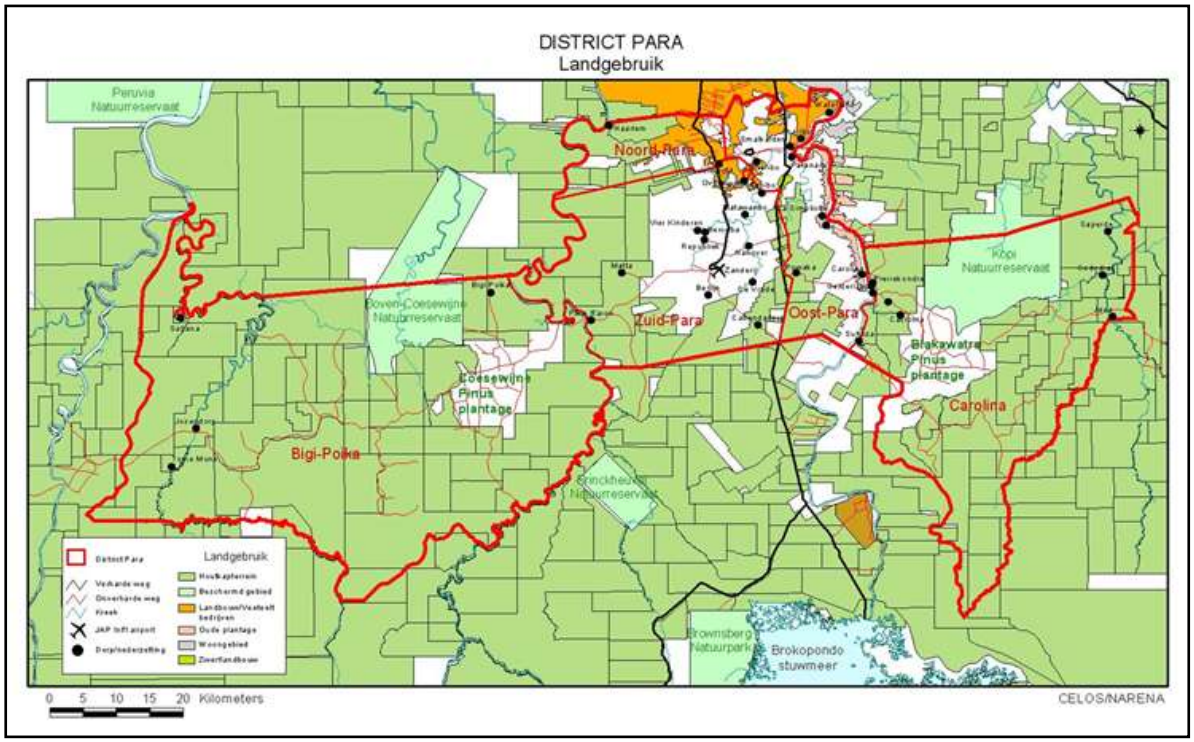

Figure 17. Landuse in Para District

6.2.3 CLIMATE CHANGE

In his lobby for sustainable development UN development guru Jeffrey Sachs summarizes the threat of climate change as follows: “All of our civilization (the location of our cities, the crops we grow, and the technologies that run our industry) is based on a climate pattern that will soon disappear from the planet. The Earth will become much warmer than it has been during the entire period of civilization; the sea level will become much higher; the crops that feed humanity will suffer many devastating harvest failures as a result of high temperatures, new kinds of pests, droughts, floods, losses of biodiversity (such as pollinating species), and other calamities”. [Sachs, 2014; p.51]

Scientists warn that humanity is leaving the “safe operating conditions” for the planet; disrupting not just the climate but several of Earth’s natural systems. These include the depletion of freshwater sources (such as underground aquifers); the pollution from heavy use of chemical fertilizers (applied in order to improve crop productivity); the change in ocean chemistry, mainly the increasing acidity of the ocean resulting from atmospheric CO dissolving into ocean water; the clearing of forests to create new pastureland and farmland; and particulate pollution caused by many industrial processes, especially those involving the combustion of coal. All pose deep threats to the Earth and the well-being of humanity.

Scientists’ visualized the ten major planetary boundaries that humanity is in danger of exceeding: 1. climate change, 2. ocean acidification, [117] 3. stratospheric ozone depletion, 4. Nitrogen Cycle, 5.

[117] Planetary Boundaries Reprinted by permission from Macmillan Publishers Ltd: NATURE, Rockström, Johan, Will Steffen, Kevin Noone, Åsa Persson, F. Stuart Chapin, Eric F. Lambin, Timothy M. Lenton et al. “A Safe Operating Space for Humanity,” copyright 2009.

Phosphorus Cycle, 6. Global fresh water use, 7. Change in land use, 8. Biodiversity loss, 9. Atmospheric aerosol loading and 10. Chemical pollution. Humanity will exceed the safe operating limits unless the world adopts a strategy to achieve sustainable development. [Sachs 2014; p.53]

Temperature and precipitation

The mean annual temperature in Suriname has increased by 0.2˚C since 1960, an average rate of 0.05˚C per decade. This rate of warming is less rapid than the global average. Available data show a significant increasing trend with the average number of 'hot'[118] days per month in December, January and February (DJF) has increased by 7.5 (an additional 24% of days) between 1960 and 2003; and the average number of 'hot' nights per year increased by 102 (an additional 28% of nights) between 1960 and 2003. Mean annual rainfall over Suriname has not changed with any discernible trend since 1960. There is not sufficient daily precipitation data available to determine trends in the daily variability of rainfall (McSweeney 2010/2012).

Projections of future climate using a general circulation model (GCM), shows an increase in the mean annual temperature between 0.8 and 3.1˚C by the 2060s; and between 1.3 and 4.7 degrees by the 2090s. All projections indicate substantial increases in the frequency of days and nights that are considered 'hot' in current climate. Projections of mean annual rainfall project a wide range of changes in precipitation for Suriname (ATM 2013).

Extreme weather conditions

Extreme weather conditions often occur related to El Niño and La Niña events. A connection has been postulated between extremely dry conditions in Suriname and strong El Niño events, as well as between extremely wet conditions in the country with strong La Niña events. Extreme weather conditions are also observed during *sibibusi* (torrential rain accompanied by strong wind) events, when wind speeds of up to 30m/s occur (over 100 km/hour; 67 mph; 58 knots). Such winds can cause significant damage in urban areas. To date, it is unclear how global climatic circulations affect extreme weather patterns in Suriname. Events such as *sibibusis* and strong variations in rainfall have not been consistently observed, and therefore no analyses have been produced (ATM 2013; p. 66).

Sea level rise

Based on analysis of 5 major projections a 1 meter sea level rise projection has been adopted for Suriname (ATM 2013, p.67).

As the sea level will rise, the frequency of occurrence of a storm surge at a given height will increase. However, absence of storm activities on the Suriname's coast should normally keep this coast free of storm surges at least in the near future. However the winds shall definitely be stronger than what they are now, owing to the increase of CO2 in the atmosphere and the rise in temperature, which is directly connected to the storm activity. These changes will contribute to higher wave intensity and consequently an intensive and stronger attack on the shoreline, resulting in a stronger degree of erosion. Because of Sea Level Rise, long lasting floods will be the most common phenomenon. Large-scale inundation will be observed when heavy rains will coincide with high water tide, since the greater part of the drainage systems will be closed as this is based on gravity flow. The impact zone of the sea level rise will comprise a part of the Young Coastal Plain, including low-lying creeks, river valleys and inland swamps. The low-lying coastal foreland, which is virtually without protection, except for the natural defense by the mangrove zone, will be subjected to permanent flooding. This may reach as far as the first natural (sand and shell ridges) or artificial (roads, polder dams) obstacles in the south, thus covering an area of up to 15 km from the sea. Inundation will also be enhanced as part of the coastal

[118] 'Hot' day or 'hot' night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season.

plain is getting subsided due to the ongoing agricultural and land reclamation activities. (NIMOS, 2005 p.52-53)

Changes will enter also in the estuaries of the rivers. This will involve a change in riverbed and bank sedimentation and erosion patterns. It is to be expected that part of the shores along the lower river courses will be subjected to increased erosion, while elsewhere more sedimentation will take place. Sea level rise and changes in the sedimentary budget will certainly have impact on the mangrove forests as they occur at the land-sea interface. The mangrove scenario in Suriname would be one of stability in areas of accretion. In areas suffering strong erosion, the mangrove will be destroyed. Whether the mangroves will encroach on the newly flooded areas will depend on favorable factors such as relatively homogeneous geomorphology, muddy sediments, gentle land gradient and humid climate (NIMOS 2005, p. 52).

Since the majority of the population lives on the low coastal plains, a rise in sea-level of 1 meter along the coast of Suriname by the year 2100 would have enormous impact. In some rivers, specifically the ones without sufficiently buffering rapids, sea-level rise will cause the tidal limit to move farther upstream by the year 2100. Saltwater intrusion, linked to this change of the tidal limit, will have a negative impact on existing and potential new agricultural grounds and food production areas found along the river banks. The supply of freshwater fish could also diminish due to changed water quality. Degradation of water quality in the lower courses of rivers and creeks will also have negative impacts on crop and animal production which could lead to increased malnutrition and decreased immunity from disease, resulting in an overall decline in health. (ATM 2013, p.89)

6.2.4 Emergencies Affecting Public Health and Safety

Communicable diseases in Suriname are characterized by respiratory infections and a few vector-borne diseases. Regarding the latter, all four types of the dengue virus have been confirmed on the coastal plains. Occurrences of malaria are currently negligible in the coastal areas and well under control in the interior; there are a few areas, however, where malaria has been endemic in the past. (ATM 2013).

As this report is written, Suriname is still in the aftermath of a Chikungunya pandemic which has hit the entire Caribbean region hard. According to Prof. Dave Chadee of the University of the West Indies (UWI)[119], the pandemic exposes the weakness of Caribbean national capacities to deal with such new scenarios:

“With jet aircraft, huge ships and container cargo we have a situation where people who are infected in one part of the world can be transported to another part of the world within 24 hours. That means that they may have acquired the infection but do not display the symptoms for up to a week after their arrival in the new country; and these large ships can transport numerous mosquito vectors. Such infections with short incubation periods can cause major disease outbreaks in countries which are completely unprepared. Chikungunya is a perfect example of this process.
It is an African-Asian disease, which was brought to the Caribbean by a viremic person, and with the presence of Aedes aegypti mosquitoes (which is also the vector for dengue), transmission was easy. The situation is explosive because we have never had chikungunya, and the whole population is immunologically naïve. We also have no means of detecting infected persons before they manifest symptoms, and the low level of vector control has led to an increase in the vector density (in this case

[119] Trinidadian entomologist and parasitologist and a world expert on vector-borne diseases; interview by Raymond Ramcharitar published in the Guardian of Monday, October 6, 2014

the mosquito). So the vector density (the number of mosquitoes present) is very high and medical institutions have little or no practical knowledge of clinical diagnosis and management."

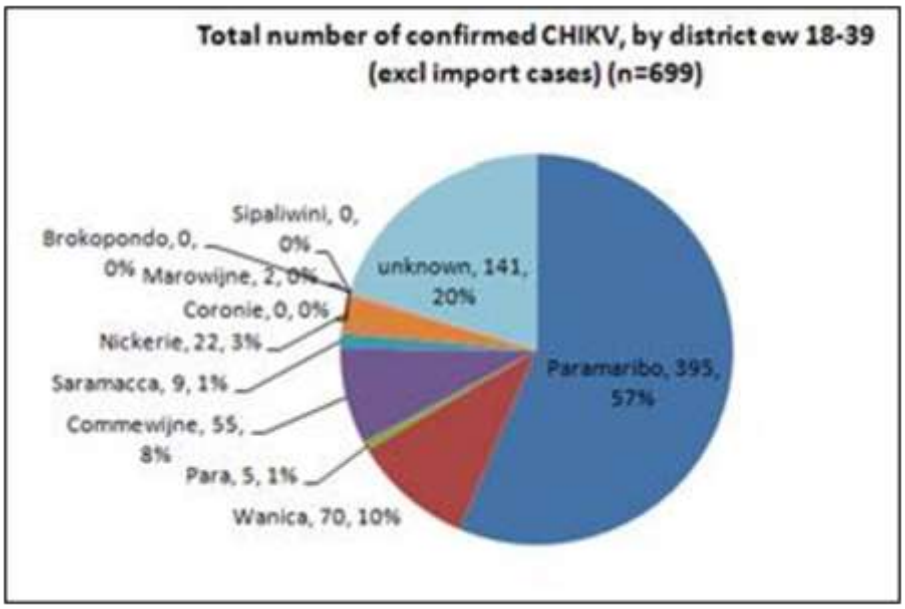

Figure 18. Total number of confirmed chikungunya cases by district

October 4, 2014, the Bureau for Public Health informed society that Suriname up until September 30 2014 had registered 713 positive cases of Chikungunya.[120] One person died.
The most urbanized districts had the highest number of cases: Paramaribo 395, Wanica 70 and Commewijne 55.

Links Precipitation and Health

Changes in precipitation may have the following impacts on human health:

Increases in cases of vector-borne diseases, such as malaria in the interior and dengue in the coastal area; increases in cases of upper (nasal area and throat) and lower (respiratory tract and lungs) respiratory illnesses; and increases in incidents of diarrhea and in the likelihood of cholera outbreaks.

Besides giving rise to vector diseases such as malaria, standing water can also increase the risk of contamination of drinking water reservoirs, which would lead to a rapid increase of outbreaks of disease. Flooding may also increase the mobilisation of toxic chemicals and dangerous heavy metals and pesticides from manmade storage or stable environmental pools. When excessive water enters such places it causes disturbances and possible leaching. This could potentially contaminate agricultural land, aqua-cultural installations, and fishing areas and drinking water reservoirs.

Contrarily, periods with less rainfall can help control diseases transmitted by mosquitos and other insects, such as malaria, filariasis, dengue, leishmaniasis and yellow fever. However, extended drought decreases aquifer replenishment and thereby takes its toll on fresh water supplies, causing scarcity of clean drinking water. Swamps and wetlands may also be affected by droughts, which may consequently reduce the availability of freshwater fish, an important source of protein in the diet of many Surinamese people. An increased risk of forest and other natural fires may affect air quality, causing occasional but severe respiratory illness in nearby populations. A combination of these factors

[120] Combined registrations form the Academic Hospital Laboratory, the Institute for Medical Science Laboratory and the Central Laboratory; Pie with n=699 comes from CAREC

could also lead to an increase in the occurrence of gastrointestinal diseases, diarrhea and skin disorders (***ATM*** 2013 p.88).

6.3 VULNERABILITIES

6.3.1 Analytical Criteria and methodology

For both districts, some vulnerabilities are similar, while others differ. It is possible to identify:

- Vulnerability due to geographical location
- Vulnerability based on socio-economic conditions
- Vulnerability due to lack of awareness

Although they can be identified separately, in practice they are found to impact upon each other.

6.3.2 Components

a) Vulnerability due to geographical location for Commewijne

The risk of flooding and coastal erosion are most apparent for residents of the ressorts bordering the ocean, but also for the ressorts bordering the Suriname River, as riverbank erosion has also been identified as a risk.

Salination impacts all ressorts in terms of access to drinking water (ground water too salt to use) and impacts the sustainability of livelihoods (agriculture, horticulture and fisheries). The majority is small farmers and fishers.

b) Vulnerability due to geographical location for Para

Most risks identified for Para are localized. For road safety, people living and working close to the main road are more at risk. Communities located under the flight routes of the JAP International Airport are most at risk in case of a plane crash. Communities living in the vicinity of mining and other industries are more at risk for health hazards following from chemicals used, stored or leaked.

In general it can be remarked for Para that remoteness and isolation form a risk of its own.

When discussing the capacities of emergency services (Fire Department, Police) in the next paragraph, it is important to note their locations are all limited to the 'center' of the district (North, South and East Para). Basically, the same goes for other services, such as secondary education, markets for products, and financial and administrative services. Although communication has greatly improved by setting up infrastructure for mobile phones, access is still limited. For example, in the village of Powakka (East Para) there is this one specific spot on the school yard where you can be reached by phone. In case of an emergency, it is hard to get in touch with the most remote villages in Bigi Poika and Carolina. Only recently (December 21, 2014) the (new) bridge over the Suriname River connecting Carolina with the rest of Suriname was opened. For years, villagers were depending on a pontoon to cross.

c) Vulnerability based on socio-economic conditions for Commewijne

Small farmers and fishermen are extra vulnerable for risks such as flooding, inundation, salination and fresh water scarcity. Many people combine agriculture and/or horticulture with a job in the civil service. This complicates quantifying actual risk and losses, as people are not registered as agricultural entrepreneurs; and people might be reluctant to indicate normal revenues out of fear for the tax department. Also, the small-scale losses that occur frequently are not registered, and would not be

considered a disaster by definition. Added up however, frequent small-scale losses do impact the sustainability of livelihoods considerably. Specific data should be collected.

d) Vulnerability based on socio-economic conditions for Para

Small farmers in Para share this vulnerability with their peers in Commewijne. Respondents of former plantations remark on the group of unemployed youth who is willing to plant but does not have the financial reserve to wait for harvest time. Apart from the investment in time, the dependence on climate and the possible occurrence of inundation makes agriculture a high-risk investment in the perception of youth; as compared to the quick gain of small-scale gold mining, for example.[121] School dropouts (including teenage mothers) have been identified both by respondents from local government as by communities as a vulnerable group. This has also been documented quite extensively.[122]

With regard to the most remote Indigenous communities, the floods of 2006 and 2008 had a long term effect on the food security of villages**.** Both national and international reports (from 'Binnenland Overleg' and ECLAC respectively) have mentioned the enormous impact of the losses because of the self-sufficient nature of agriculture: people have no alternatives. Emergency assistance was short-term and did not cover the period for new crops to grow. Not much has been done to enhance the resilience of communities for future emergencies.

Furthermore, the lack of communication and warning systems enhances the vulnerability of remote communities.[123]

e) Vulnerability due to lack of awareness in Commewijne

Awareness about a possible disaster is lacking, as indicated by a high level District Authority:

"No, the people would not know what to do in case of a flooding. We would need a lot of external help. But then, we have never experienced such a calamity. Flooding only happened in the interior, it never has happened here."

This lack of awareness impacts the choices made in spatial planning in an adverse way. For example, close to the river a home for senior citizens has been established (*Simba* on Marienburg, 38 residents) and even closer to the river a nursing home has been established (*Evie* on Ellen, 28 residents).[124] None of the respondents identified these residents (people who are not or limitedly mobile) in a probable/future danger zone, as vulnerable.

As mentioned, people are often not aware of health risks of contamination of water, be it by chemicals, vectors or feces. The Disaster Prevention Unit of the Suriname Red Cross (SRK) observed that institutions and organizations based in the capital trust too much on means of mass communication for health education and awareness; without measuring if this actually reaches the most vulnerable populations.[125]

f) Vulnerability due to lack of awareness in Para

At the workshop it was remarked that environmental services more and more resort to using pesticides to clean banks of creeks and rivers. As the DC of Para actively uses the environmental services as an unemployment opportunity for school drop outs, these low-educated youths might not

[121] Interview with Elviera Sandie, Plantation Administration La Prosperité
[122] For example, Coillie, van, W. 2013. Creating Chances for school dropouts in Para. Social Academy, Heverlee (Belgium)
[123] Interview with Max Ooft, Association of Indigenous Village Leaders in Suriname (VIDS)
[124] Data on residents as of December 1, 2014
[125] Interview with Humphrey Blinker, SRK DP Officer

use the pesticides properly/ might not protect themselves properly because they are not aware of the dangers and are not willing or able to follow instructions. This was marked as an urgent concern.

6.4 CAPACITIES

6.4.1 Analytical Criteria and Methodology

Using the Criteria Identifying Key Actions for Disaster Risk Reduction (DRR) Planning, organizations and institutions in the districts of Para and Commewijne have been categorized according to:

- Mandate to act in prevention and/or response
- Capacity to act in prevention and/or response
- Coordination and Communication (including Early Warning Systems)
- Means (financial or otherwise)

6.4.2 Mandate to Act in Prevention and/or Response

a) Mandate of Local government on district level

As detailed in the legal framework, the District Commissioner (DC) has an adequate mandate to act. Under the Act of Regional Bodies[126], the District Commissioner has a lead role in the Disaster Management System of the country (Figure 19*)*. As indicated under Legal Framework, the Act on Regional Bodies gives the District Commissioner the responsibility to maintain peace and order (Art. 47 paragraph 1;b); and a specific mandate to use –by force, if needed- buildings, means of transportation and the assistance of residents in case of disasters and calamities (Art. 49, paragraph 1 and 2).

Both the Police Chapter (Art. 16) and the Act on the Fire Department (Art. 6, paragraph 3) are completely in line with this mandate, stating clearly that the Districts-Commissioner responsible for maintaining peace and order in his district is therefore in charge of the police and also in charge of the Fire Department in his district.

In the NCCR structure, the Dictrict Commissioner is therefore the Head of the Disaster Committee in the district, and central in the web of response.[127]

It is not entirely clear whether the legislation (and instructions on local level) for health personnel also acknowledges this mandate of the DC. The same question could be asked for multinationals present in the district who have their own safety protocols.

In practice, the DC decides who to mobilize. Says staff of Commissariat Para: 'In times of crisis the DC calls his Districts Management Team [heads of the different units within the Commissariat plus District Council and Ressort Council) to discuss what to do. He prefers working with the people who live here as they know what is going on and are close by.'

The DC heads the District Administration [*Districtsbestuur*] which is entrusted with the daily management of the districts. This body is made up of representatives from the different line Ministries present in the district, such as Public Works, Health and Education. The DC is also the Chair of the District Council (the highest political body)[128], supervising the daily administration.

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[126] Act of June 29, 1989, rules regarding the arrangement and powers of the Regional Bodies S.B. 1989 no. 44

[127] Slide from presentation by H. Blinker, SRK representing the Republic of Suriname on a conference on Comprehensive Disaster Risk Management, Japan August 2014

[128] The District Council is politically appointed based on the number of seats acquired in the elections for the Ressort Councils.

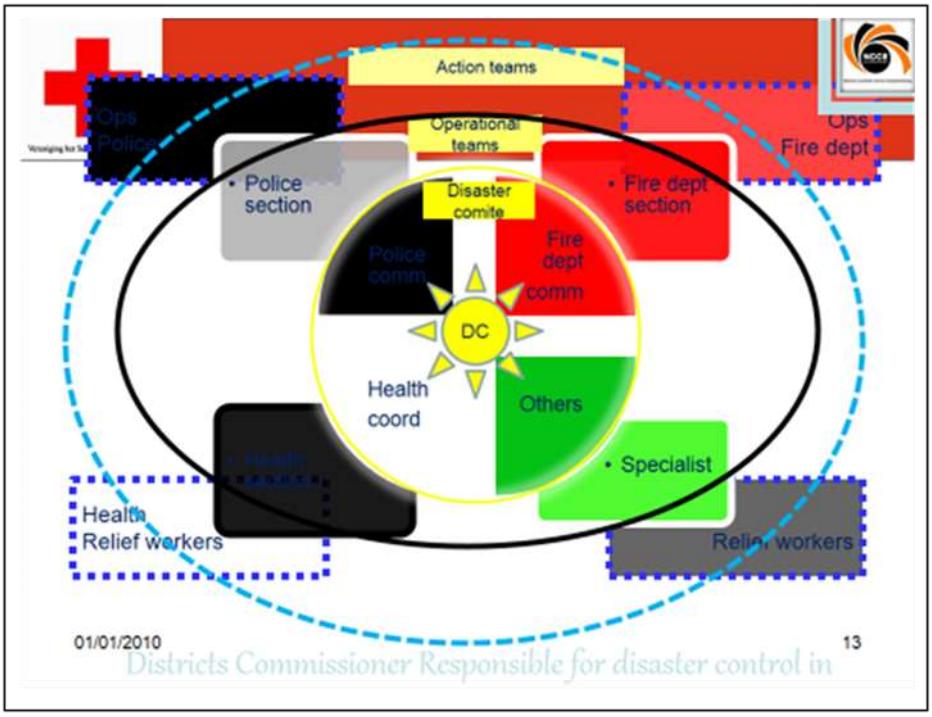

Figure 19. Responsibilities of the District Commissioner for disaster control

As detailed under Governance Structure (4.3.2), the Decentralization and Local Government Strengthening Program (DLGP)[129] empowered the districts governments with the core legal framework and institutional capacity necessary for financial self-management.

In that sense, the mandate for prevention measures has also been decentralized; From the maintenance of wet infrastructure (prevention of inundation) to the collecting of waste (prevention of health crises); and from the issuing of permits and land allocation to the passing of specific legislation for the district.

b) Traditional Authorities

As mentioned under Political Structure (par. 4.3.1), traditional authorities of Indigenous and Tribal Peoples have historically been governing their territories in the interior *de facto*. *De jure*, traditional law has been tolerated next to the central State legislation. At the start of the DLGP it was advised to structure participation of Indigenous and Tribal Peoples formally by defining powers for Village Councils within a certain geographical area (Kambel 2007).

Among the Maroons chieftaincy is still intricately linked to the clan and lineage, whereas among the Indigenous groups the criteria and procedure of appointing a village chief do not necessarily require membership of a given clan or lineage. A study on the role of traditional leadership undertaken in 2009 raises this issue for the process of legal formalization of the role and status of the customary chiefs: should the clan and linage system provide the framework for formalization, or should the village be recognized as the basic administrative unit? Furthermore, the study concludes that the formation and development of the Indigenous and Maroon societies and the subsequent process of acculturation has left the customary village leader with two kinds of tasks: the more customary roles associated with traditional Indigenous and Maroon culture (protocol, funerals, conflict resolution, rituals etc.); and the roles associated with national government, the money economy and the more western oriented development institutions (western health, western education, economic

[129] Financed by IDB

development projects, environmental issues associated with resource extraction etc.). A SWOT analysis of the roles of chiefs showed a staggering responsibility of 92 tasks accumulated from six perspectives on roles: governance, economy, social development, infrastructure, environment and natural resource and external relations (SSDI/IDB 2010).

The lack of legal status is considered the main threat to the institutions of chieftaincy. Due to the lack of statutory authority the chiefs run into a wide range of problems, especially when dealing with the introduced institutions such as gold mining, timber extraction and other non-customary economic activities. (SSDI/IDB 2010).

Traditional authorities operate alongside formal structures such as the elected bodies of Ressort Councils and the administrative and operational bodies of the Ministry of Regional Development (RO), managed by the District Secretariat. Different structures are operating on the same level, sometimes all present in one community (as in the case of the Indigenous Community of Powakka). It is not really clear who would be mandated to take charge in case of an emergency.

Case of Powakka

"The rules for construction are unspoken, people just know. It is mostly grandchildren who want to come back to the village, or others who want to have their own place when they come for the holidays. Others want to set up a little business. If people not related want to come and stay, they have to talk with the Village Council and they have to submit a copy of their ID and an extract of civil status. When a clear arrangement is reached, a statement is written with one copy for the village and one for the beneficiary. Contributions are agreed to be paid into the Village Fund. This way, we are able to fund our own activities and contribute to projects. In case of an emergency, the Village Council would be first responsible. If they could not solve it, they would ask assistance from BOG, the commissariat, or NCCR. Powakka has one residing member of the Ressort Council, as well as one *Bestuursopzichter (RO*), who is our link with the Commissariat."

The Government of Suriname recently drafted legislation on Traditional Authorities[130], taking into account the need to regulate the administrative relations between the central government and traditional authorities. According to representatives of Indigenous and Tribal Peoples, the draft legislation does not address the complexity of roles addressed above and needs rigorous amendments.

6.4.3 Capacity to Act in Prevention and/or Response

a) Capacities at Community Level

In the past, selected communities in the Districts of Sipaliwini, Commewijne, Nickerie, Para and Paramaribo, have been trained by the Suriname Red Cross (SRK) in conducting Vulnerability and Capacity Studies (VCAs). This has been followed by training to establish a Community Disaster

[130] Conceptwet 2014, houdende de regels over het Traditioneel Gezag

Response Team (CDRT), also by Suriname Red Cross and targeted at both Para and Commewijne (2010).

SRK Plan of Action 2014 mentions that, in the absence of a clear disaster policy or strategy, many NGOs started projects in disaster prevention and mitigations throughout the country. As there is no linkage to government disaster management structures, the results of many of these good efforts are not recognized. SRK identifies the lack of sustainability of projects, the lack of recorded data, and the lack of identified risk information, as crucial factors in missing the goal of making vulnerable communities resilient.

The creation of a Village Sustainable Development Platform was suggested to assist the Chiefs in their varied and technical development tasks. This platform could also prepare an annual village development plan to, via the Chief, feed into the ressort plan, then the district plan to feed and finally into the national planning (SSDI/IDB 2010). This trajectory would link the local to national in sustainable development planning, and could be the link with DRR planning.

b) Capacities to act in prevention and/or response: Health Services

The Regional Health Service (RGD) offers primary health care via public primary healthcare facilities in Suriname's coastal areas.

The coastal area has been divided in Rayons, which each have a Rayon Coordinator. The district of Para is part of Rayon IV Wanica/Para (total staff of 49). Para has 3 RGD locations: Onverwacht, Bernarddorp, and Zanderij. Further South, the villages have access to primary healthcare facilities of the Medical Mission[131]: Pikien Saron, Bigi Poika, Powakka and Redi Doti.

The district of Commewijne forms Rayon V (total of staff 37) with 5 RGD locations: Nw. Amsterdam, Ellen/Margrita, Tamanredjo, Alkmaar and Meerzorg. The facilities are in general very basic and, in the case of isolated communities, not permanently staffed. For example the people of Margrita[132] (on the right bank of the Commewijne River) have to rely on a mobile health worker coming in 2 days a week. Out of all health facilities in Para and Commewijne, only Health Center Ellen is equipped with 1 bed. [133]

Through the Bureau of Public Health (BOG) and with support from UN agencies training is organized regularly to upgrade the prevention function of primary health care. So far, this has concentrated mainly on information and education on hygiene and nutrition. Taking the health risks for Para and Commewijne into account, it could be recommended to include information and education on water, sanitation and the use of chemicals.

The RGD facilities form a crucial link in signaling health crises, as their data provides the input for the data of the Epidemiology Division of the BOG (collected through regular communication by phone). With pandemics such as dengue and the recent Chikungunya pandemic (August-November 2014), RGD General Practitioners were the first to sound the alarm. The communication with Medical Mission is not as structured.

Health workers in primary healthcare are in general not trained for emergency response, nor are facilities equipped. In Commewijne, different members of the Fire Department, the Police Department, the Regional Health Service (RGD) and local authorities have participated in Community Emergency Response Team (CERT) training in February 2012, organized by NCCR.

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[131] Primary Healthcare in the interior is delegated by the government to the Medical Mission

[132] Former plantation officially named Johanna Margaretha, but better known as Margrita

[133] Ultimate Purpose, 2012. Report on training in Communication Skills for under 5 care units of the Regional Health Service (RGD) in the coastal area of Suriname. Bureau of Public Health

There are complaints both from communities as from local government about the reduced presence of Environmental Inspectors in the field. This varies from no response to requests to investigate quality of drinking water and/or sanitation facilities to the absence of monitoring the quality of food items and the preventive measures against mosquitoes as vectors of dengue and chikungunya. The reduced presence is confirmed by the Department of Environmental Inspection. Reportedly for budgetary reasons, inspection only covers Paramaribo, Nickerie and Commewijne.

c) Prevention infectious/contagious diseases at the airport

The international airport does as yet not have adequate quarantine facilities. A temporary space has been dedicated by the Airport Authorities but it does not meet the criteria (air circulation is not closed off, doors do not close hermetically). Construction drawings for a permanent quarantine facility have been finalized. The Bureau for Public Health (BOG) has a permanent location at the airport and is present on a daily basis. However, no one is adequately trained in recognizing symptoms. There is also no capacity to test. A link with potential capacity to identifying micro-organisms such as the CELOS lab has not yet been made. [134]

Precautions to be taken by flight crews (statement on sick people aboard to be filled out on board by Captain or purser; spray before landing) are still treated by some as a formality. At the time of writing this report, BOG was in the process of meeting with airlines to raise awareness on this.

d) Response to health emergencies/calamities at the airport

BOG is responsible to take hygienic measures (to prevent infection) in case of a crash. On a plane crash drill organized recently by the Airport Authorities *(NV Luchthavenbeheer*) together with Police, Fire Department and Airport Security, BOG was invited as observer.

Surinam Airways, the national carrier, is offering medical services on the airport, including beds. This is a great improvement towards individual cases; it would however not suffice for a calamity. As local health services only offer primary healthcare, this would mean transportation of victims to the capital. Obviously, this is a risk in the case of infectious/contagious diseases. [135]

e) Capacities to act in prevention and/or response: Fire Department

In the district of Commewijne the Fire Department has material and manpower at Nieuw Amsterdam (Figure 20) and Tamanredjo. An additional post has been planned for Stolkertsijver, near to the border with the district of Marowijne. Material and manpower are deemed adequate for the tasks and responsibilities.

Different members of the Fire Department, the Police Department, the Regional Health Service (RGD) and local authorities have participated in Community Emergency Response Team (CERT) training in February 2012, organized by NCCR.

Participants from the Fire Department evaluated learning to work with a compass to enable coordinated search for victims as the most useful part from the training.

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[134] Interview with Ricky Stutgard, head of the Microbiological/Veterinary Laboratory at the Center for Agricultural Research (CELOS), ADEK

[135] Focus group with Department Environmental Inspection (*Milieu Inspectie*) Contactpersoon: sectie chef 2e klasse Purcy Stuart, Jaggernath R. Milieu inspecteur 4e klasse, Edwards, C mw. Milieu ins 4e klasse, Limon, G, 4e klasse.

"As trained firemen, the saving of victims is in our curriculum so probably the training would be more useful for communities and local authorities. We are the first at location so our first priority is to do our job. Little things, we can handle ourselves, it does not get reported centrally. NCCR should only intervene when something big happens and different organizations need to be involved." [136]

This is completely in line with the Incident Command System (ICS) as explained under Institutional Framework (5.3).

Figure 20. Nieuw Amsterdam Fire Post

The NCCR initiated training in 2013 on Land Use and Rescue (basic course). The coordinator District Secretary (DS) Tjokrodikoro emphasized that the 3 policemen and the 3 firemen who participated have been instructed that they are to take the lead in case of an emergency.

Observed: the post of Nieuw Amsterdam (picture) is close to the Commissariat and seems relatively low. In case of flooding, they might be in the danger zone.

The Fire Department based on the JAP International Airport (Zanderij) is prohibited to intervene anywhere else outside of their specialty (fires related to aircrafts). The district of Para previously did not have an own Fire Department post and had to be covered by the post on Lelydorp in the neighboring district of Wanica. Since March 23 2012 there is also a post operational on Onverdacht (next to the Commissariat).

Statistics previous to this date were not segregated for Para.

Statistics over 2012 (left column for each location) and 2013 for both Para and Commewijne show most firefighting interventions regard grass fires. It is remarked that, since Nieuw Amsterdam is more densely populated, people will warn/complain earlier, whereas in Para most grass fires probably go unregistered. Most emergency assistance interventions regard the extermination of (aggressive) Brazilian bees. [137]

Table 12. Korps Brandweer Suriname

Afdeling: Gewestendienst	Interventions January To December 2012 and 2013					
INTERVENTIONS	2012	2013	2012	2013	2012	2013
	PARA		COMMEWIJNE		COMMEWIJNE	
Firefighting	Onverdacht		Tamanredjo		Nieuw A'dam	
Fires in homes /other buildings	2	10	3	7	0	4
Waste fires	7	2	17	9	28	16

[136] Interview with Mr. E. Wongsopawiro, Brandmeester (6 years on Commewijne), November 2014

[137] Data and information provided by Bianca Salim, Hoofdbrandwacht Kabinet Repressie / Gewesten November 2014, additional interview by phone

Grass fires	64	15	41	8	104	66
Other fires	11	6	1	3	2	14
False alarm	0	2	1	1	6	0
Total	84	35	63	28	140	100
Emergency assistance						
Traffic accidents	2	5	3	10	2	0
Hazardous substances accidents	0	0	0	2	0	0
Exterminating Bees	126	156	66	195	216	255
Removing reptiles	2	6	1	3	8	7
Other	6	6	0	15	35	103
False alarm	0	0	0	0	0	0
Total	136	173	70	225	261	365

In the District of Para, no specific training has taken place for either the Police or the Fire department.

f) Capacities to act in prevention and/or response: Korps Politie Suriname (KPS) / Police Force

In the district of Commewijne the KPS has recently opened 1 bureau[138] in Richelieu. Alongside the main coastal road connecting East- and West-Suriname there is also a Police Post on Tamanredjo [number of kilometers from the city or New Amsterdam] and a Police Post on Stolkertsijver [close to the district border with Marowijne].

The personnel on the Police posts have specific instructions to control all passing traffic and are therefore limited in their capacity to assist in case of an emergency. If this would require them to leave their post they would have to report to a bureau to call for assistance.[139] . The district of Para also has 1 bureau and several posts in the most centralized resorts. Unfortunately no statistics could be retrieved on registration/interventions in case of emergencies and incidents.

It was observed by both respondents of interviews and participants in the workshop that a lot of regulation is in place, but is not enforced. Therefore it is recommended that the Police Force should be informed and educated on a regular basis about legislation and regulations concerning health and environment. For example, regulations on the use of pesticides, legislation on poaching, maximum weight for trucks, and so on.

g) Capacity to act in prevention and/or response: District Commissioner and District Team

[138] A bureau has full capacity of police tasks: record and investigate complaints and criminal offenses, assist the public

[139] Interview with spokesperson Humphrey Naarden for the Police Department. Unfortunately no details could be retrieved on the district of Para.

As detailed under Governance Structure (4.3.2), the Decentralization and Local Government Strengthening Program (DLGP)[140] empowered the district governments with the core legal framework and institutional capacity necessary for financial self-management, enabling them to take prevention measures. Both Commewijne and Para have been certified for autonomous financial capacity (Level 1) and for enhanced management capacity and capital investment (Level 2) and have implemented civil works and infrastructure projects successfully. [141]Progress made in Para includes more communities having access to improved drinking water; improved garbage collection; cleaning of ditches and drainages 'on demand'; mitigated isolation by establishing daily shuttle buses connecting remote areas in the district.[142]

Progress made in Commewijne includes structured garbage collection; hygiene inspection of stores and food sellers; plans for generating drinking water out of surface water; some progress on wet infrastructure hampered by challenging coordination.

Concerns: As key legislation towards the financial sustainability of the districts has not been approved by Parliament, the third phase of DLGP is put on hold. This could imply limited capacity (financially) to actually operationalize the mandate of the DC.

Furthermore, key legislation to guide the DC in operationalizing his/her mandate is lacking, for example the Framework on Environmental Legislation and the Law on Spatial Planning. The technical capacity to guide decision-making on land use is also not available on the district level.

h) External capacities for prevention and resilience: Scientific support

Scientific support could contribute to both prevention and resilience. Staff of the microbiological/veterinary laboratory of the Centre for Agricultural Research in Suriname (CELOS) indicates they could help farmers' resilience to get crops after a disaster.[143] Staff of the chemical and the environmental laboratory of the Faculty of Technological Sciences (FTeW) indicate they could do much more relevant research if funding was made available[144]. Since 16 February 2011 both laboratories have been in possession of the ISO 9001:2008 certificate for quality management. With regard to the Ministry of VG, the Central Laboratory of BOG was also rehabilitated and reopened in September 2010. (ATM 2011; p. 84)

The Ministry of Agriculture, Husbandry and Fishery (LVV) is in the process of finalizing the residue lab and veterinary lab. The building for the Caribbean Agriculture Health and Food Agency (CAHFSA) which started mid-2012, has been finalized with Suriname funding. As the lab is a regional endeavor, other CARICOM member states have to fund staffing.[145]

The availability of scientific support in the city does not seem to translate to much support on district level. A closer look should be taken at possible linkages.

6.4.4 Coordination and Communication [including Early Warning Systems]

The DLGP has also enhanced capacities for Disaster Risk Reduction in the area of Coordination and Communication. In the area of ICT there is:

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[140] Financed by IDB

[141] Mr. Hernan Aspiazu, End of Program (DLGP-II) Evaluator during the Closing workshop DLGP-II on 29-1-2014 in Royal Torarica, Paramaribo.

[142] Interview Head Environment and Health, Para

[143] Interview Ricky Stutgard

[144] Interview Sheryl Starke

[145] Interview Alies van Sauers-Muller, Disaster Coordinator LVV; and concept budget LVV 2015]

1) *Wide Area Network (WAN)* – a system linking the servers of all district administrations to a central point. This could be used to service the disaster information needs of the district administrations, e.g. through the provision of risk maps; 2) *Inter-Districten Samenwerkingsverband (IDS)* – an integrated network that has been established between districts to stimulate district cooperation. This could include cooperation in the area of DRR and CCA planning and response; and 3) *Data Management System (DMS*) – this is being established to service the IDS network with information, documentation, models, formats, details, etc., necessary for the development of policies. It already has information relevant for DRR and CCA such as digitised road and drainage networks, including all coastal protection infrastructure works such as dams, dikes, bridges, sluices and pump stations.

In terms of communication, the One -Stop Service Counters already in existence in all 10 districts (and planned to be present in all 62 ressorts) could be used for the reporting of incidents and disasters. Furthermore the Bevolkings Info Centers (BIC's) located at all District Commissariats provide an effective mechanism for sharing information between district administrations and citizens. Especially the Facebook pages are used by the public to address concerns. The BICs have instructions to sms or app mentions of hazardous situations through to NCCR. A next level would be to extend the network to Administration Offices in the field.

In terms of coordination, districts could be empowered to develop District Disaster Management Plans as sub-plans of the District Development Plans (which they already have to prepare annually). District Disaster Management Units could be established under the already existing Divisions for Environment and Health. Concerns for DRR could also be mainstreamed into the existing Citizen Participation Structures (*hoorzitting*) used to formally include civil society (citizens, CBOs, NGOs, ward committees) in decision making processes.

6.4.5 Means for Disaster Risk Reduction

Means can be understood as (financial) resources available and opportunities for risk transfer. Risk transfer can be defined[146] as the process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party. Insurance is a well-known form of risk transfer, but it can also occur informally within family and community networks (where mutual aid is expected) as well as formally where governments or multi-lateral banks establish mechanisms to help cope with losses in major events.

a) Risk Transfer available on a national level

Emergency Fund

The Ministry of Social Affairs manages a fund to assist in cases of a wide range of acute emergencies such as house eviction, necessary medical treatment abroad, fire and natural disasters.[147] Every Surinamese citizen can apply to the Emergency Fund. In case of a natural disaster, the client receives an order for building materials based on NCCR reports to the Ministry on the amount of damage. On the budget for 2014 it appears for an amount of SRD 500,000.[148]

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[146] UNISDR Terminology on Disaster Risk Reduction (2009)

[147] Beleidsmaatregel no. 135 (Acute noodsituaties). Information received through Cabinet of the Permanent Secretary of the Ministry of Social Affairs and Housing

[148] De 12-E Afdeling van de begroting van uitgaven en ontvangsten voor het dienstjaar 2014 betreffende het MINISTERIE VAN SOCIALE ZAKEN EN VOLKSHUISVESTING

Home Insurance

Suriname counts 4 insurance companies with possibilities to insure homes and corporate buildings (including contents) against fire and lightning (and burglary). There is one company offering an option to cover damage by severe winds, and another offering an option to cover damage caused by *vertically* incoming rain water[149]. Flooding therefore has no coverage. There does not seem to be a national coverage rate for home insurance.

Basic Healthcare Insurance

On October 9 2014 the Act Basic Healthcare Insurance (approved September 9, 2014) became operational. This Act obliges every resident of Suriname to be insured for a basic healthcare package. The obligation includes companies who already have their own insurance policy.

All current private health insurances (AZPAS and PZS) meet the criteria of the new Act. There is also a Basic Healthcare Insurance Self Reliance (BZSR) financed by the government. Surinamese citizens in the age group 0 t/m 16 years and the age group 60 years and beyond can apply for this package. [150]

There is some concern about the group in-between 16 and 60 years of age who, because of their economic status, were issued Social Health Cards (*On-en Minvermogenden*) by the Ministry of Social Affairs. This modality is now being phased out, with people whose card is expired being directed to the BZSR. It is not clear so far what would happen with people who cannot afford the BZSR. This could be a vulnerable group.

This could also be stated for all residents and migrants without the Surinamese nationality who cannot afford the BZR.

b) Opportunities to decentralize risk transfer: District Fund and Village Fund

Momentarily, there is no budget specified for assistance in emergencies on district level. In the case of roofing displaced by severe winds in Commewijne, incidental assistance was given. The Head of Administration at the Commissariat emphasizes that, if this where to happen on a more regular basis, the budget would not suffice. The Commissariat mentioned this as a priority to NCCR.[151]

There is critique from several respondents on the necessity to go to NCCR when, for example, roofing is damaged due to severe winds: *"People should be able to find help in their district. It does not help if one has to find a pickup truck and drive from Nickerie to the city to try and find sink roofing with NCCR. But this is what has happened in the past. This should also be decentralized. This is why districts need their own Emergency Fund."* [152]

With the current decentralized budgetary and financial authority, the District Fund actually can be used easily to decentralize funding for DRM and CCA activities. NCCR could also 'park' funds for financing responses to disasters in the districts[153]. The DC has the authority to reserve those funds and appropriate allocation can be monitored by co-signing. Since the system is transparent, the NCCR could actually look into the allocation of the funding. This modality is already being used by other Ministries. For example, the Ministry of Youth and Sports has now parked 1 million SRD into the District Fund of Para to build a sports center in Redi Doti[154].

[149] inventory of websites of Fatum, Self-Reliance, Prolasco and Assuria 2014
[150] Website Basis Zorg Verzekering Suriname 2014
[151] Interview with District Secretary Tjokrodikoro of Commewijne/Head Administration December 1, 2014
[152] Interview community leader trained in Community Disaster Response Team training, November 2014
[153] Report Workshop Mainstreaming IDB 2013
[154] Interview mr. B. Ahmadali DLGP

The same system could be applied on community level with a Village Emergency Fund.

7. DISASTER RISK ANALYSIS FOR TWO SELECTED DISTRICTS

The following table summarizes a) the distinct hazards/risks documented, experienced and/or perceived for the districts Commewijne and Para; b) the drivers of risk, categorized by natural and manmade factors, and matched as necessary; c) capacities on different levels. The last column d) details enabling regulations into legislation, coordination and mandates.

Awareness

1) Definition of disasters

There is no uniform concept of what constitutes a disaster, as is shown by different definitions used by the NCCR and the Surinamese Red Cross (SRK). Furthermore, the criteria to record disasterDisaster information on the international databank EM-DAT (10 or more people reported killed; 100 people reported affected; a call for international assistance; declaration of a state of emergency) are taken to define disasters for Suriname officially. In practice, both NCCR and SRK also refer to smaller or localized events or emergencies as disasters; for example, the damage done by severe winds in recent years. Awareness on Disaster Risk, and thus also awareness on the need to reduce this risk, is lacking on all levels of society. This seems to be caused by two misconceptions: 1) the definition of a disaster "to exceed the ability of the affected community or society to cope using its own resources" is translated to ***national*** capacities; while events are ***often localized*** and therefore need an assessment of the ***local capacities***.

2) Perception of disasters as natural. There is a history of natural disasters only in the interior. People in the districts do not feel this affects them; also policy makers tend to think we do not have disasters, especially in comparison with the Caribbean region that experiences hurricanes on an annual basis.

As the risk analysis of both Commewijne and Para above shows, most hazards identified are the result of human activity: manmade, not natural. This refers to political, social and economic conditions underlying the ***social construction of risk***. This concept stems from two central ideas: (i) the understanding of risk as a process, i.e. a phenomenon that occurs when certain conditions of territorial sustainability are ignored in the development process; and (ii) that the processes underlying the construction of risk are essentially social, despite the fact that physical phenomena associated with disasters may be natural.

The concept of *the social construction of risk* is mentioned in several plans and reports. It is however no part of national policy, the decentralization process, or development programmes.

Commewijne

Table 13. Hazards documented, experienced and perceived for the District of Commewijne

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
1	Flooding from sea	Natural: land relatively low compared to sea level No occurrences of severe flooding historically documented Manmade: documented tidal flooding as a result of coastal erosion and low quality of dikes Manmade: predicted sea level rise climate change.	Monitoring, maintenance and protection of dikes needed; Expertise to inform continuous decision-making on natural and artificial dikes available (UN/ADEK); Emergency Response of population trained by SRK 2013 Emergency Response of local emergency services trained by NCCR/CDEMA 2012	Legislation on Spatial Planning; awaiting establishment of legal bodies to operationalize *Planwet* Integrated Coastal Zone Management (ICZM) Plan 2010; awaiting implementation DC mandate and coordination; budget?
2	Coastal erosion	Natural: moving mud banks and beaches Loss of tourism investments documented due to unawareness of these processes Manmade: clearing of coastal forests to create agricultural and residential areas; documented loss of land and damage but no quantification; Adding to risk: excavation of sand; equalizing plots by project developers	Expertise to inform continuous decision-making on natural and artificial dikes; Expertise for zoning land based on the quality/ natural function of the land. Capacity to formulate conditions and zones for sustainable land use/to monitor and to sanction breaches of those conditions	Legislation on Spatial Planning; see 1 Integrated Coastal Zone Management (ICZM) Plan 2010 see 1 Department of Soil Mapping (ROGB); no experts; none delegated to DCs
3	salination of soil and water	Manmade: result of coastal erosion (clearing of mangrove) and tidal flooding; documented	Capacity to formulate conditions for sustainable land	Department of Soil Mapping (ROGB); no experts; none delegated to DCs

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
		loss of land for agriculture/horticulture and loss of usable groundwater; no quantification	use/to monitor and to sanction needed; Data on losses; studies on possibilities: to determine course (Preservation? Compensation? Relocation?)	National Biodiversity Action Plan (NBAP)2012-2016 (2013)
4	Riverbank erosion	Natural: no documentation	Monitoring of timbering alongside the riverbanks	shared/conflicting responsibilities between different Ministries DC Department Infrastructure mandate and coordination; budget?
5	Severe winds	Natural: increased occurrence documented by Meterological Service and damage documented by NCCR Manmade: impact of severe winds aggravated by clearing trees; corrugated sheets roofing not constructed storm-proof	Specific localized weather forecasts on a longer term; monitoring trends No practice of conservation of old trees and/or planting of new trees; Storm-proof roof construction; expertise from the region with hurricane experience?	Ministry of Public Works: Act on Construction (2002) limited to the city; no technical requirements for DRR; DC to formulate and implement 'tree policy'(spatial planning)
6	Inundation	Manmade: negligence of historical waterways and bad maintenance of drainages and waterworks; incidents registered by Commissariat but damages not quantified	Protection and maintenance of waterways and waterworks	shared/conflicting responsibilities between different Ministries DC Department Infrastructure mandate and coordination; budget?
7	Scarcity of freshwater	Manmade: groundwater brackish because of	Improving awareness on and	Subsidized durotanks with netting?

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
		salination; facilities for collecting rainwater lacking; water distribution (trucks) not serving needs equally;	use of rainwater collection; Expertise to inform decision-making on filtering surface water (ADEK/CMO); information and education on water, sanitation and the use of chemicals within Primary Healthcare	Regulating of use of chemicals in upstream industries, agricultural activities and households/sanctioning on littering; sanitation
8	Storage of chemical waste	Manmade: chemicals stored at Peperpot: danger of leakage, polluting soil and water; contamination of old factory area Marienburg	Areas to be analyzed to conclude the level of pollution and the recommended course of action; Expertise from national labs not used/linked; international experts needed?	International Health Regulations (IHR) and Basel Convention; Environmental Legislation
9	Processing of medical waste	Manmade: processing plant planned; location, processing procedures and ways of monitoring still unclear	Inspectors BOG neither equipped nor trained as yet to control facilities of this nature; Expertise from national labs not used/linked; international experts needed?	International Health Regulations (IHR) and Basel Convention; Environmental Legislation
10	Use of pesticides	Manmade: pesticides used for agriculture, maintenance of public green spaces and to control weed on river and creek sides: pesticides impacting soil and water and causing erosion. Lack of awareness/concern with both users, policy makers and the general public	Statistics available on chemicals up to 2014 limited to general imports; No national data on pesticide use or on the impact on health of pesticides; No recent national data on the impact on the environment since 1992; The Ministry of LVV in the process	International Health Regulations (IHR) and Basel Convention; Environmental Legislation DS Environment: Control of sales; training of DC personnel; DC Decree to forbid pesticides in maintenance:

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
			of researching use and impact. Training of direct users on the damaging impact of weed-killers; and how to prevent/mitigate this. (LVV, RO and OW) Constant (re)search to provide better methods/ less toxic alternatives before banning the old product. Need for awareness raising for policy makers and the general public.	

Table 14. Hazards documented, experienced and perceived for the District of Para

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
1	River Erosion	Natural: For the region Onverdacht [*Onoribo*] until Highway strong underground currents cause instability of land, and erosion of the riverbanks of the Parariver. Manmade: residential construction on land declared unstable by elders; Experienced but not documented: The *Meursweg* (road including a bridge over the Parariver) connecting East with North and South Para had collapsed approximately 15 years ago.	Monitoring of timbering alongside the riverbanks; Expertise needed for zoning land based on the quality/ natural function of the land.	Coordinated by department infrastructure Commissariat; Ministry of OW; Department of Soil Mapping (ROGB); no experts; none delegated to DCs or local authorities (*Plantage bestuur*).
2a	Road Safety	One narrow main road connects from the capital to the international airport, to the main mining industry areas down South, and the interior communities even further South. The road has no pedestrian or bicycle path, no emergency lanes, and is occupied on both sides with residential and commercial buildings.	Difficult access to a calamity for emergency services; and the absence of evacuation routes / routes to transport victims away from the calamity; Primary healthcare Health workers in general not trained for emergency response; facilities not equipped.	National Road Safety Plan (2010); status unknown; National Health Disaster Plan Safety Plan 2009; status unknown;

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
2b	Road Safety: Transport of dangerous goods and heavy loads	Regular and extensive transport of fuel for industries and remote communities; transport of chemicals for industries going South, and transport of mining/logging products (sand, granite, and wood logs) coming back to the capital. Multiple incidents with tilted trucks (including fuel, dangerous goods and heavy loads) documented over the past 2 years.	No weigh bridges available to determine if a vehicle is a) appropriate for the weight it carries, or b) is allowed to use roads and bridges with a weight limit; Drivers in general not trained in safety: knowing what they are transporting, the danger, and how to act in case of a calamity; Police perhaps? SLO Domain *Road Transport* not yet operational Multinational corporations expected to adhere to safety protocols in line with international conventions; suspected that local industry does not; no monitoring capacity or authority	Legal instruments regulating each stage of chemicals (from import to disposal), include NIMOS guidelines on Petroleum Products and Industrial Chemicals; Framework Legislation on Environmental Management elevating NIMOS to the National Environmental Authority still to be approved. National Road Safety Plan; Disaster Management Legislation/ legal status NCCR (draft)
3a	Villages (and new concessions) under the flight routes of JAPI Airport	Manmade: Flight routes are over Indigenous communities of Hollandse Kamp, Matta, and Wit Santie. New concessions are reported to be emitted in the same area.	Communities have been trained in CDRT by Suriname Red Cross in 2013. No regular upgrades or drills. Expertise to determine no-go area based on safety regulations	DRR Policy needed to upgrade/drill vulnerable communities annually; Mandate to declare flight area no-go area for emission of land
3b	Mass storage of aviation fuel close to traffic.	The one way out of the airport leads traffic within meters reach of the mass storage of aviation fuel. Relocation of the tanks would be an enormous investment.	More research on extra security guidelines for aviation fuel storage, with f.e. the International Civil Aviation Organization (ICAO).	Construction of an alternative road. Ministry of Transport, Communication and Tourism (TCT), together with Fuel Company SOL

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
4	Inundation	Natural: annually some inundation in the rainy season. Manmade: using swampland for construction and thus deleting natural water storages; Lacking maintenance of water works; In 2009/2010 plantations and communities in South and North Para were severely flooded; People had to be evacuated. As of 2013, only plantation Osembo reported flooding.	Protection and maintenance of waterways and waterworks; Expertise needed for zoning land based on the quality/ natural function of the land.	Department for Infrastructure DC/Ministry OW; Department of Soil Mapping (ROGB); no experts; none delegated to DCs or local / traditional authorities (Plantage bestuur or tribal Chiefs).
5	Sanitation not meeting safety criteria	Manmade: septic tanks constructed to outdated criteria in Construction Legislation. Most remote communities use (unprotected) water wells and pit latrines; not aware of risks.	Instructions on importance and construction of the safest rectangular septic tank of ferroconcrete (LISP); Instructions on importance of, and safe construction and safe placing of toilets; Awareness raising on rural Ordonnance on placing of latrines in relation to water sources	Act on Construction criteria (Ministry OW) not on par with health criteria; Act on Construction limited to urban Paramaribo: Ordonnance for rural areas [Anchillostoom] not well known IDB Water Master Plan (completed 2010) and Sanitation Sector Strategic Plan; in process of implementation?
6	Droughts	Natural: Scarcity of drinking water> health risk;	Improving awareness on and use of rainwater collection;	Subsidized durotanks with netting?

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
		Manmade: grass fires; Manmade: competition for surface water for tourism> risk for livelihood	Water Masterplan needed to regulate availability of surface water	National Health Disaster Plan Safety Plan (2009); status unknown
7	Contamination of soil and groundwater by Ornamibo landfill (Wanica)	Manmade: uncontrolled disposal of unseparated chemical, toxic, organic and other waste; risk of contamination of soil, groundwater as well as runoff contamination (in case of inundation) into the Para River (cross-border risk). [Documented by environmental experts].	information and education on water, sanitation and the use of chemicals. Monitoring: different Labs related to LVV	Environmental legislation? Health rules? Mandate DC Wanica; ROGB zoning; National Health Disaster Plan Safety Plan; status unknown
8a	Mercury poisoning by artisan gold mining / **all** mining without mercury emission control	Manmade: Health risk of neurological damage to all vertebrates including humans: esp. in fetuses, infants and young children; through inhalation (lungs), ingestion (stomach), skin or placenta [documented extensively]. Environmental risk 1) poisoning bottom sediment, water and fish [mercury levels in sediment and predatory fish exceeding international standards documented]; 2) over-load of	Need for environmental legislation and the involvement of health and labor inspectors; Information and education on water, sanitation and the [health] consequences of the use of chemicals **urgently** needed; Capacity to monitor mercury emission present (ADEK University)	Minamata Convention on Mercury; roadmap towards ratifying prepared (April 6, 2014); Commission for Committee Regulation of the Gold Sector not yet able to regulate; no indication of mercury emission control for entire mining sector (focus on poknokkers)

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
		sediment in rivers causes high turbidity threatening biodiversity in aquatic ecosystems.		
8b	(violent) conflicts over land use/rights	Manmade: social risk of violent conflict between gold miners over mining rights; and between gold miners and communities about land use [conflicts experienced in Para; violence documented for older gold mining areas].	Lack of legal clarity (mandates of national government, Committee, regional, local and traditional authorities not synchronized) prohibits capacity to intervene.	No zoning and no land rights. Role of Traditional authorities combines enormous responsibilities (governance, economy, social development, infrastructure, environment and natural resource and external relations) with a lack of legal status
9	safety of former mining area for re-use	Manmade: risk of instability of the land, and the possibility of chemical waste [suspected, not documented]	Verification of monitoring by mine company> research institutes? Inspectors? Multinationals have their own safety protocols	Multinationals have their own safety protocols;answer to who?
10	Quality of drinking water	Manmade: risk of contamination by increased land use around aquifer providing drinking water for coastal Suriname [not documented]	Information and education on water, sanitation and the use of chemicals; see point 5 on sanitation	No legal protection of water winning area
11	Deforestation by (illegal) wood logging; for mining and construction purposes	Manmade: environmental risk 1) erosion; 2) decreasing biodiversity; 3) CO^2 emission caused by large scale wood logging; also illegal wood logging	Forestry monitors wood logs transported over the road; No rules / monitoring of trees being cut in clearing of parcels of land for use.	Spatial planning and zoning National Forest Policy (NFP) National Climate Change Action Plan (NCCAP) from 2007;

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
		reported; and as condition for mining and construction. Manmade: safety risk as trees/forests break the force of severe winds.		DC mandate to regulate but no criteria to apply
12a	Climate change for Suriname: temperature rising	Manmade: environmental and economic risk increase of 24% of hot days and 28% of hot nights for the period 1960-2003 [documented]; increase of 0.8 - 3.1˚C in the mean annual temperature by the 2060s [projected]	Awareness lacking on all levels; from policy makers to wide public. Monitoring of trends not published in national media	National Biodiversity Action Plan (NBAP) 2012-2016 and NCCAP
12b	Climate Change: sea level rising	Manmade: projected 1 meter sea level by 2100 rise will cause stronger winds, higher waves causing more erosion, floods and inundation and salination of rivers; impact on crop and animal production can lead to malnutrition	Early warning systems on severe winds, floods, inundation and salination; Monitoring trends in all these events to base projections, policy and interventions on.	National Biodiversity Action Plan (NBAP) 2012-2016 and NCCAP and ICZM

	a) **Hazards/Risks**	b) **Drivers of Risk**	c) **Capacities**	d) **Legislation, coordination and mandate**
13	Emergencies affecting Public Health and Safety	Manmade: pandemics caused by imported diseases (population immunologically naïve) [experienced and documented Chikungunya 2014]	Vector control not adequate; airport no quarantine room and no capacity to test; Health staff no practical knowledge of clinical diagnosis and management; No link with qualified labs (ADEK/CELOS)	Missing National Disaster Response Plan; National Health Disaster Plan Safety Plan 2009; status unknown

8. CONCLUSIONS AND RECOMMENDATIONS

Recommendation 1

Awareness raising on disaster risk reduction with a strong focus on the social construction of risk on all levels; with a priority for a) members of Parliament in charge of national legislation; and b) local and traditional authorities in charge of local legislation and enforcement [District Commissioner and staff; Tribal and Indigenous Chiefs and cadre; Plantation Administrations].

Recommendation 2

Strengthen local capacity to collect data of risks and losses due to localized and recurring events (like inundation, droughtsdraughts, and severe winds) to enable informed decentralized DRR planning.

8.A Enabling Regulation [legislation, coordination, mandate of Authorities]

Key legislation for DRR is still missing: the draft Disaster Management Legislation and the Law providing the NCCR with a legal base have not been approved as yet. Another main legislative gap is the Framework Legislation on Environmental Management, which would, among others, elevate NIMOS to become the National Environmental Authority (still to be approved); and the Planning Enactment (Planverordening) to be operationalized. The Land Registration and Information System (GLIS**)** legislation (S.B. 2009 no.149) stipulates all issued land should be registered in the GLIS, including concessions for mining of rocks, mineral or precious metal. This legislation was however passed and published omitting the establishment of a Domain Enterprise in which all departments relevant to land registration should be incorporated.

Spatial Planning policy should aim to guarantee and enhance the quality of life and to improve the spatial quality of both urban and rural areas. Destination plans for the territory of the Republic of Suriname should be anchored in a Law on Spatial Planning.

An integrated approach to the planning of land use and management requires involvement of all stakeholders. There should be optimal coherence between social, economic and ecological development in allocation, arrangement and use of land. The dispute around landLand rights of Indigenous and Tribal Peoples (ITP) should therefore be solved as soon as possible. The lack of statutory authority for the Traditional Authorities of ITP should be solved simultaneously.

The GLIS should also detail land that is left, unused and/or part of inheritance disputes. Since these unoccupied lands and unsolved inheritance disputes [former plantations, especially in Para and Coronie] hinder development, the Domain legislation should be re-evaluated {Domeindecreet S.B. 1981, nr. 125).

The lack of a Law on Spatial Planning and the land rights' issues also limits the possibility of Suriname to attract conscious investors and to classify as High Forest Cover, Low Deforestation (HFLD) country.

A roadmap towards ratifying the Minamata Convention on Mercury has been prepared since April 6, 2014. The Convention sets clear goals and guidelines for the control of mercury emission for both small-scale (artisanalartisan) and large-scale mining. The Committee Regulation of the Gold Sector as yet has not been able to regulate artisanalartisan gold-mining, and there is no indication of mercury emission control for the entire mining sector. A KAP study (2014) on artisanalartisan gold-mining suggests two main immediate steps: 1) to stop whole ore amalgamation and 2) increase recycling, among others by obliging use of a retort.

Recommendation 3

Key legislation that ensures the link between development plans and sustainability and disaster risk reduction needs to be made operational. Institutions should be given the legal mandate to actually monitor and enforce this legislation. Urgent Laws: a) Disaster Management Law, with NCCR as authority; b) Framework Legislation on Environmental Management; c) Planning Enactment, with theThe Planning Council and the Planning Coordination Committee as authority; d) GLIS Law to acknowledge the Domain Enterprise as authority; e) Law on Spatial Planning in which all destinations plans (from local to national) should be anchored; mandate to be decided by Ministries of Spatial Planning, Natural Resources, and Regional Development.

Recommendation 4

Legislation should be re-evaluated to recognize collective title to land; in the process to guarantee land rights. The the principle of Free, Prior and Informed Consent (FPIC) should be applied to any emissions of land traditionally used by Indigenous and Tribal Peoples (Para). The law should also offer legal solutions to the problem of unoccupied lands and unsolved inheritance disputes (Para).

Recommendation 5

Regulate the administrative relations between the central government and traditional authorities with legislation that addresses the complexity of roles of Traditional Authorities for Indigenous and Tribal Peoples.

Recommendation 6

The Minamata Convention should be ratified to guide the development and implementation of a widely supported action plan to phase out the use of mercury in artisanalartisan gold-mining; and to minimize mercury emission from all mining. The regulatory role of the Committee Regulation of the Gold Sector should be evaluated. For the mining sector at large, the mandate to monitor and sanction should be awarded to the most capable authority, be it the Ministry of Natural Resources or the Ministry / Entity responsible for Environment.

Uniform legislation on drinking water and sanitation is lacking outside the city of Paramaribo. Both Para and Commewijne face challenges with fresh water resources and with the discharge of grey and black wastewater. Furthermore, the Act on Construction for urban Paramaribo issues criteria (Ministry OW) for septic tanks that are not on par with health criteria and should be adapted. Recommendations from earlier reports and studies advise the establishment of necessary institutional organization for water management, such as a Water Authority.

Recommendation 7

Make legislation uniform by applying the same norms for the criteria for water and sanitation in both urban and rural areas; Organize water management by installing a National Water Authority; update construction criteria to latest health standards indicated in the IDB Water Master Plan (completed 2010) and Sanitation Sector Strategic Plan.

The Act on Construction for urban Paramaribo does not specify any technical requirements related to disaster prevention. Taking into account the increased occurrence of, and damage done by severe winds, this is an urgent matter.

Recommendation 8

Update technical requirements for construction to include disaster prevention criteria such as stormproof roofing; consider using the available expertise from countries in the hurricane-belt of the Caribbean region.

Plans and Policies

International commitments have resulted in a variety of national plans and policies; not many show substantial progress of actual implementation. The cohesion between different Plans, and the relation with disaster risk reduction, could also be improved. As climate change has a clear impact on biodiversity, the National Biodiversity Action Plan (NBAP) 2012-2016 should be linked up with the National Climate Change Action Plan (NCCAP) from 2007 (to be updated), which has a focus on adaptation and mitigation. The NBAP shares goals with the National Forest Policy (NFP), with the NFP focusing mostly on production, and the NBAP focusing on rehabilitation and monitoring. An integrated climate change policy is still missing. An Integrated Coastal Zone Management (ICZM) Plan was completed in 2010 specifically for Commewijne and the other coastal districts. There is a National Road Safety Plan (2010) and a National Health Disaster Plan (2009) but it is not clear how currently operative they are.

NCCR does not have an overview of all plans related to safety and security of people and their environment. The Center implies the Bureau for National Security (BNV) should take the lead in this as BNV should concentrate on making broad policy, while NCCR concentrates on preparedness, concept legislation, response coordination and recovery. BNV should also produce the National Strategic Safety Plan.

Recommendation 9

Provide legal basis, context and authority for implementation of plans where necessary (NBAP); update where necessary (NCCAP); urgently implement the ICZM Plan (Commewijne); operationalize National Road Safety Plan and National Health Disaster Plan; ensure and monitor coherence between related plans.

Recommendation 10

Evaluate the placement of key bodies (NIMOS, Climate Change Unit, NCCR, and BNV) in the Cabinet of the President in relation to coordination, cooperation, efficiency and effectiveness of disaster risk reduction and management; ensure the National Strategic Safety Plan includes a DRR Plan based on risk as a social construction.

8.B Capacities for Disaster Risk Management [decentralization of DRM, resources and structures]

Central coordination

Observations on the structure of NCCR seemed to indicate a severe shortage of staff (a total of 5-6 people including support staff), especially on a higher level of decision-making (only 2-3). Also it seemed as if the NCCR staff available was very much involved in implementation, leaving little time for coordination. Data were hard to collect and the website shows information that is mostly outdated. According to NCCR its key responsibilities are preparedness, concept legislation, response coordination and recovery.

Recommendation 11

Evaluation of tasks, responsibilities and staffing of NCCR; strengthen capacity to coordinate nationally; strengthen linkages with institutions and organizations operational in prevention (including research and awareness-raising); link capacity building in DRR with the ongoing decentralization process, local institutions and traditional authorities; delegate implementation of preparedness & response training to counterparts such as the Suriname Red Cross; build a cadre of Safety and Emergency Instructors from Police, Fire Department, Army, Health Services and private professionals who can provide annual training to service providers and communities in the districts; establish linkages with certified labs for research and monitoring (from pollution of water to levels of pesticides in vegetables); and for resilience and recovery, for example scientific assistance to farmers after a flood.

Monitoring and Enforcement

Enforcement of legislation and regulations related to disaster risk reduction is considered problematic by official sources (National Chemical Profile), respondents and participants in the workshop. Obstacles identified are financial constraints, lack of appropriate monitoring tools and equipment, insufficiently qualifiedunqualified personnel, inadequate penalty provisions, slow judicial process and lack of institutional co-operation.

Recommendation 12

Delegating responsibility: The Environmental Impact Assessment Procedure (EIA) could provide an opportunity to integrate DRR and CCA considerations into private and public sector planning. The procedure could include social aspects and vulnerabilities and be upgraded to ESIA: Environmental and Social Impact Procedure;

Upgrading personnel: The Police Force should be informed and educated on a regular basis about legislation and regulations concerning health and environment. For example, regulations on the use of pesticides, legislation on poaching, maximum weight for trucks, and so on. The Department for Environmental Inspection should be expanded, decentralized and upgraded to meet the challenges out there. Where expertise is not available (for example, to control a medical waste facility), cooperation with scientists and labs should be sought;

Specialized enforcement team: A special team for enforcement that can take action on environmental and health crimes right away;

Appropriate monitoring tools and equipment: urgent installation of weigh bridges for containers in the International Seaport and all other freight ports; clear criteria for trucks to carry what load.

Decentralized capacities

For prevention:

The Districts Commissioner (DC) heads the District Administration entrusted with the daily management of the districts. The DC is also the Chair of the District Council (the highest political body), supervising the daily administration. The Decentralization and Local Government Strengthening Program (DLGP) empowered the districts governments with the core legal framework and institutional capacity necessary for financial self-management. Both Para and Commewijne earned certification for financial decentralization and for improved capacity to execute infrastructural works. The mandate for prevention measures has thus been decentralized including the maintenance of wet infrastructure (prevention of inundation), the collecting of waste (prevention of health crises), the issuing of permits and land allocation, and the passing of specific legislation for the district. This mandate has to be supported by extended capacities.

Recommendation 13

Ensure a decentralized budget for implementation of district plans including infrastructural works (enabled by further fiscal decentralization).

Recommendation 14

Urgently upgrade and expand the Department of Soil Mapping (ROGB) with experts; these experts should be delegated to DCs /made available on a regular basis to advise on local and regional planning (taking into account the condition of the soil, the natural function of the area, the dry and wet infrastructure, the presence of minerals and precious metals and so on).

Recommendation 15

Integrate the development of Disaster Risk Reduction (DRR) and contingency plans into the annual ressort and district planning process (guided by NCCR and Suriname Red Cross with regional/international assistance if necessary).

Primary healthcare is the most decentralized service available in the districts, with policlinics of Regional Health Service (RGD) in the coastal area (5 in Commewijne and 3 in Para) and policlinics of the Medical Mission (4 in Para) in communities further South. The RGD facilities form a crucial link in signaling health crises, as their data provides the input for the data of the Epidemiology DivisionDivison of the BOG (collected through regular communication by phone). The communication with Medical Mission is not as structured. Through the Bureau of Public Health (BOG) and with support of UN agencies training is organized regularly to upgrade the prevention function of primary health care. Reportedly for budgetary reasons, inspection by the Department of Environmental Inspection (BOG) nowadays only covers Paramaribo, Nickerie and Commewijne.

The international airport (Para) does as yet not have adequate quarantine facilities. A temporary space has been dedicated by the Airport Authorities but it does not meet the criteria (air circulation is not closed off, doors do not close hermetically). Construction drawings for a permanent quarantine facility have been finalized.

Recommendation 16

Upgrade communication between the Epidemiology Division of BOG and the Medical Mission so health data from the southern communities in Para can be monitored as well;

Taking the health risks for Para and Commewijne into account, include information and education on water, sanitation and the use of chemicals into the regular training of primary healthcare workers;

Urgently invest in regular technical assistance by the Department of Environmental Inspection in all districts; to support local authorities, newly installed Environment& Hygiene Officers within the District Commissariats, (small) entrepreneurs, communities and individual citizens. This Department should structurally be decentralized, with specialized expertise travelling the country;

Urgently construct a permanent quarantine facility on the international airport meeting international criteria.

The complex roles of Chiefs of Indigenous and Tribal Peoples nowadays include, besides their customary roles, governance, economy, social development, infrastructure, environment and natural resources, and external relations. A balance needs to be struck between the preservation of customary culture and skills to cope with (new) disaster risks and with introduced institutions (such as gold mining, timber extraction and other non-customary economic activities).

Recommendation 17

The creation of a Village Sustainable Development Platform to assist the Chiefs in the varied and technical development tasks. The platform can also help to prepare an annual village development plan; to be integrated in the appropriate ressort plan; Inclusion of Disaster Risk Reduction (DRR) and contingency plans in the village plans.

For response:

The District Commissioner is in charge of the Police and the Fire Department in her/his district and has a specific mandate to mobilize materials and manpower in case of disasters and calamities. It is not

entirely clear whether the legislation (and instructions on local level) for health personnel also acknowledges this mandate of the DC. The same question could be asked for multinationals present in the district that have their own safety protocols.

Recommendation 18

Decentralization and operationalization of the National Health Disaster Safety Plan (2009); to include clear lines of hierarchy and roles in emergency response for polyclinics of the Regional Health Service and of the Medical Mission per ressort and district;

Recommendation 19

Develop a memorandum of understanding with all multinationals operating in the district clarifying lines of hierarchy and roles in emergency response; with special attention for mandatory informing of the DC of any kind of emergency that might threaten health and/or environment.

Health workers in primary healthcare are in general not trained for emergency response, nor are facilities equipped. In Commewijne emergency services (Fire Department and Police Department, the Regional Health Service (RGD) and local authorities) have participated in a Community Emergency Response Team (CERT) training in February 2012, organized by NCCR. In Para no training was organized.

Recommendation 20

Make Disaster Preparedness & Response training part of annual training program for health workers in districts; especially where other services (like Fire or Police Department) are not available; make an inventory of how safe and available the locations of policlinics are in case of flooding, severe winds or other emergencies.

In Commewijne, the NCCR initiated another training exercise in 2013 on Land Use and Rescue. Participants (3 policemen and 3 firemen) are instructed to take the lead in case of an emergency. In Para, no training has taken place. With 2 posts and an additional post planned near the border with the district of Marowijne, the Fire Department in Commewijne has material and manpower adequate for the tasks and responsibilities. Para has 1 specialized unit on the Airport which is prohibited to intervene anywhere else. Para has 1 Fire Department post operational in the center of the district (only since 2012). This can hardly be of timely service to remote communities in other ressorts. Most Emergency Assistance Interventions (EAI) regard the extermination of (aggressive) Brazilian bees (90% of EAI in Para and 70% of EAI in Commewijne in 2013).

The districts of Para and Commewijne both have 1 Police Department Bureau and several posts in the most centralized resorts. Only personnel on Bureaus are directly available in case of emergencies and incidents. They could hardly be of timely service to remote communities in other ressorts.

On a community level, traditional authorities operate alongside formal structures such as the elected bodies of Ressort Councils and the administrative and operational bodies of the Ministry of Regional Development (RO), managed by the District Secretariat. It is not clear who would be mandated to take charge in case of an emergency. The Suriname Red Cross (SRK) has conducted Vulnerability and Capacity Studies (VCAs) in some communities in Para and Commewijne. This has been followed by training to establish a Community Disaster Response Team (CDRT). As other NGOs, SRK faces financial challenges in both reaching the most vulnerable communities (most remote) and in sustaining processes with communities. SRK identifies the lack of government disaster Management structures as a crucial factor in the low sustainability of projects, the lack of recorded data, and the lack of identified risk information; all crucial factors in missing the goal of making vulnerable communities resilient.

Recommendation 21

A cadre of EAI instructors should be trained and certified to train Fire and Police Department personnel (and safety professionals) on a regular basis; Frequent simulations and drills should be held on all levels: service providers, local authorities and communities;

Police and Fire Department should explore the possibility of installing Deputy Officers with specific EAI tasks;

VCA Studies should be executed and upgraded in all remote communities, followed by CDRT training (starters and refreshers); the DRR and contingency plans drawn up on village, ressort and district level should detail how often and on what scale these trainings should take place;

Improved communication facilities at the District Commissariat should be utilized to record data and fill the need for identified risk information (for example the Data Management System which already has information relevant for DRR and CCA such as digitized road and drainage networks, including all coastal protection infrastructure works such as dams, dikes, bridges, sluices and pump stations).

8.C MAINSTREAMING DRR IN SUSTAINABLE DEVELOPMENT EFFORTS

The SIDS report 2013 prepared by the Ministry of Foreign Affairs reflects on the progress made on a single development agenda. It is established that a lot of studies and analyses are still needed before a post-2015 development agenda can be formulated. The current MDGs have to be integrated into the preparation of the Sustainable Development Goals (SDGs); and the post-2015 development agenda also needs to take into account the special situation of middle-income countries like Suriname, as well as the vulnerable position of Small Island Developing States (SIDS).

In planning towards the post-2015 development agenda in Suriname, it is acknowledged that Suriname needs a clear, long-term vision on national sustainable development to replace the five-year development plans traditionally coinciding with an administration period of each new government coming to office after general elections. The five priority areas identified in the SIDS Report are:

1. Agriculture and food security
2. Energy, including renewable energy and energy efficiency
3. Natural resources management (including fisheries management, oceans governance, water resources and biodiversity conservation)
4. Climate change and sea level rise
5. Waste management and chemicals management

All priority areas mentioned and elaborated upon in the report are also areas of priority in overall national development plans and have a link with disaster risk reduction (DRR). The challenge is to mainstream DRR into the ongoing sustainable development debate.

Recommendation 22

Mainstream Disaster Risk Reduction (DRR) into future consultations and studies in the sustainable development context; and mainstream DRR awareness in all awareness raising (education, media) and advocacy (decision makers in both public and private sector) towards sustainable development.

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