

Climate and Disaster Risk Screening Report: Cote d'Ivoire¹: Hypothetical National Project

¹ This is the output report from applying the World Bank Group's Climate and Disaster Risk Screening National Level Tool(Global website: climatescreeningtools.worldbank.org; World Bank users: wbclimatescreeningtools.worldbank.org). The findings, interpretations, and conclusions expressed from applying this tool are those of the individual that applied the tool and should be in no way attributed to the World Bank, to its affiliated institutions, to the Executive Directors of The World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the information included in the screening and this associated output report and accepts no liability for any consequence of its use.

1. Introduction

Planning for resilience to climate and geophysical hazards at the national level is a vital step in the fight against poverty and for sustainable development. The National Climate and Disaster Risk Screening Tool provides early-stage, due diligence screening for climate and disaster risks to identifying potential risks at an early stage of planning on an economy wide basis. The tool applies an exposure -sensitivity - adaptive capacity framework to consider and characterize risks from climate and geophysical hazards to the priority sector or sectors within the context of the program or instrument being considered (see Annex 1).

This report summarizes the results of the screening for climate and disaster risks for Cote d'Ivoire: Hypothetical National Project , where the tool was applied for the following purpose(s):

- National level planning
- Sector wide strategies
- Planning for Institutional Strengthening
- Planning for Policy Reforms

The potential risks flagged in this report were identified through the four screening stages by connecting information on climate and geophysical hazards with the user's subject matter understanding of the sectors and relevant institutions to rate the impacts. The tool does not provide a detailed risk assessment, rather it flags risks to inform consultations, dialogue, and planning at a strategic level, as well as further analytical work.

This early stage due diligence can be used to strengthen the consideration of climate and disaster considerations in key strategic planning documents (e.g. Poverty Reduction Strategy Programs, Country Partnership Framework, Strategic Country Diagnostics, sector-wide strategies) at the national and sector levels, including policy reforms and institutional strengthening.

The results of the screening are presented below, with some supporting narrative to guide their interpretation.

2. National Climate and Disaster Risk Screening Results Summary

2.1. Development Goals and Associated Sectors

Table 1 summarizes the key development goals to achieve the proposed plans or policies, as well as the associated sectors that user as selected as being critical to the success of these plans, strategies, or policies. This information is provided by the task team. In some cases, these associated sectors could underpin the delivery of multiple goals.

Table 2 lists the priority sectors that were screened for climate and geophysical hazard, and geographical locations of importance to each sector.

Table 1: Summary of the Country's Key Development Goals And Associated Sectors

KEY DEVELOPMENT GOALS	ASSOCIATED SECTORS
Consolidating peace and security and promoting good governance are prerequisites for economic recovery and poverty reduction.	<ul style="list-style-type: none"> • Other (improving the management) • Public Administration, Law and Justice • Information and Communications
Transforming Côte d'Ivoire into an Emerging Economy. he program will consist of improved fiscal policies; deep structural reforms in the cocoa/coffee, energy and oil sectors; and improvements in transparency and governance, which are expected to strengthen investor confidence.	<ul style="list-style-type: none"> • Energy • Agriculture • Transport
Improve access to potable water, adequate sanitation services, energy and a livable urban and rural environment. (i) expand the national rural water and sanitation program; (ii) establish a specific budget for this program; (iii) develop a national standard for community-run water systems and a tariff system that promotes access for all; and (iv) rehabilitate damaged urban water systems in selected cities. A second priority is to improve rural water and basic sanitation, and a third goal is to improve urban water supply for secondary cities.	<ul style="list-style-type: none"> • Health and Other Social Services • Water • Trade

Table 2: Summary of the Locations of the Priority Sectors Identified As Critical To Meeting the Country's Goals and Priorities

PRIORITIZED SECTORS	LOCATIONS
Energy	Yampussoukro, Divo.
Agriculture	Much of the country lies within tsetse-infested areas, and cattle are therefore concentrated in the more northerly districts. Settled herders are concentrated in the dry north, mainly in Korhogo, Ferkessedougou, Bouna, Boundali, Odiene, and Dabakala.
Health and Other Social Services	Enter here the parts of the country where this sector is focused.
Water	Abidjan, Yampussoukro, Divo.

* Please note that this is based on user inputs and the coverage may not be comprehensive.

2.2. Historical / Current and Future Trends and Potential Impacts of Hazards on Priority Sectors

Table 3 presents a summary description of exposure to climate and geophysical hazards for the Historical/Current and Future time frames for Cote D'Ivoire.¹ Exposure to climate hazards is evaluated in two time-frames, because past records are not necessarily indicative of future conditions. These sector potential impact ratings, for both time frames are derived on the basis of the hazard information, subject matter expertise, and contextual understanding of the country and sector(s).

Some key things to keep in mind as you interpret these results:

- **Natural Hazards:** The descriptions provide a summary of the key characteristics and some indication of the trends in exposure from each hazard, drawing on global, quality controlled data sets from the Climate Change Knowledge Portal. It is useful, for example to understand the temperature range and the rate of increase annually or decadal in a country; the precipitation shifts in relation to seasonality; and other hazards as relevant. Because geophysical hazards (earthquakes, tsunamis, landslides, and volcano eruptions) do not have associated future projections, exposure for these hazards, if selected, is assessed only in the Current/Historical time-frame.
- **Rating for Sector Potential Impacts:** It is important to look at the sector impact from each hazard for both historical/current and future time frames. For example, a country's transport assets may not have been damaged by flooding in the recent past, making potential impact in the Historical/Current time-frame low. But a significant increase in flooding over time could raise the potential impact on this sector if the country's roads, rails and airport runways are not designed to withstand more frequent or more severe flooding. The input from these ratings would be important to inform the overall sector rating as presented in Table 7.
- **Time Periods:** Understanding the changing nature of the exposure to climate hazards as it relates to the different sectors is also important. For investments with long lifetimes, such as physical infrastructure for the transport, agriculture, or energy (hydropower) sectors, considering future conditions is critical to avoid "locking in" to designs that are not suited under changing climate norms. For example, inadequate design standards for road networks in exposed locations that will be increasingly exposed may not be viable; or irrigation infrastructure designed for historical water quantities may be less effective in the future.

Please keep in mind that the greatest value of the tool is that it provides a structured and systematic process for understanding climate and disaster risks. The actual ratings themselves, while instructive, should inform further consultations, dialogue, and future planning processes.

¹The Historical/Current time is the average from the 1960-1990 period to the 1990-current period. The default Future time-frame selected in the Country Adaptation and Risk profiles is mid-century, 2040-2059. Users can choose to select another time frame, or choose to use national/local data sets, but if so, this should be reflected in the notes section of the tool (and summarized in Annex 2). The CCKP draws on global, quality-controlled datasets and is continually updated as new data become available. In some cases, the CCKP is supplemented with other sources of information. For more detail on the data used in this step, please refer to the Data Annex. Climate Change Knowledge Portal (<http://climateknowledgeportal.worldbank.org>).

Table 3: Climate and Geophysical Hazards, and Potential Impacts for Priority Sectors for Current and Future Time Periods

NATURAL HAZARD	TIME SCALE	DESCRIPTION OF HAZARDS	ENERGY	AGRICULTURE	HEALTH AND OTHER SOCIAL SERVICES	WATER
Extreme Temperature	Current	Temperatures and humidity generally follow the same pattern, with average temperatures between 25 °C and 30 °C and ranges from 10 °C to 40 °C. Temperatures are higher in the south but may exceed 30 °C even in the far north. Annual and daily ranges of both temperature and humidity are small along the coast but increase progressively toward the north. Average relative humidity is 85 percent in the south and 71 percent in the north. Mean annual temperature has increased by 1.0°C since 1960, an average rate of 0.21°C per decade. The rate of increase has been most rapid in April May and June, a around 0.27°C per decade.				
	Future	The mean annual temperature is projected to increase by 1.0 to 3.0°C by the 2060s, and 1.5 to 5.2°C by the 2090s. The range of projections by the 2090s under any one emissions scenario is around 1.5 - 2.5°C.				
Extreme Precipitation and Flooding	Current	In the central forest region, rainfall is high (1346 - 2540 mm), high humidity, and seasons less clearly marked. The earlier, shorter dry season (November to mid- March) is followed by a short wet season (mid-March to mid-May), a short dry season from mid May to mid July and the great rains for mid July to mid November. There is a long wet season from June to October and the dry season extends to six or seven months. Mean annual rainfall has decreased by 5 mm per month per decade since 1960. The intensity of Atlantic hurricanes has increased substantially since 1980.				
	Future	Rainfall projections project a decreasing trend in rainfall during June- August. Rainfall events are projected to increase seasonal variability and extreme events.				

NATURAL HAZARD	TIME SCALE	DESCRIPTION OF HAZARDS	ENERGY	AGRICULTURE	HEALTH AND OTHER SOCIAL SERVICES	WATER
Drought	Current	Drought have occurred in the country. For example Drought settled over West Africa's Ivory Coast region when wet season rains came late in 2007.	Yellow	Red	Orange	Red
	Future	Drought occurrences are likely to increase with projected increases in temperature.	Yellow	Red	Red	Red

NATURAL HAZARD	TIME SCALE	DESCRIPTION OF HAZARDS	ENERGY	AGRICULTURE	HEALTH AND OTHER SOCIAL SERVICES	WATER
Sea Level Rise	Current	Proxy sea level rise data from Santa Cruz de Tenerife I & Tenerife, Spain, indicates the mean sea level trend is 1.62 mm/year with a 95% confidence interval of +/- 0.31 mm/year based on monthly mean sea level data from 1927 to 2009 which is equivalent to a change of 0.53 feet in 100 years.				
	Future	In Cote d'Ivoire, a 1-m sea-level rise will lead to inundation of 1,800 km ² of lowland. The rate of shoreline retreat as a result of erosion is estimated to vary from 4.5 m to 7.4 m per annum (ICST, 1996). The most threatened infrastructures on the coastal zone are the Autonomous Port of Abidjan (Port Autonome d'Abidjan, PAA) and the port of San Pedro.				

NATURAL HAZARD	TIME SCALE	DESCRIPTION OF HAZARDS	ENERGY	AGRICULTURE	HEALTH AND OTHER SOCIAL SERVICES	WATER
Storm Surge	Current	Abidjan, Cote d'Ivoire is one of the top 20 cities where the most people will be at the greatest risk from sea level rise and storm surges in the developing world.				
	Future	Storm surge height is expected to increase, but estimates are highly uncertain.				
Strong Winds	Current	Information not available				
	Future	The maximum wind speed from tropical cyclones is expected to increase, but estimates are highly uncertain.				
Landslide	Current	Landslides Disaster Average 0.03 Per Year. in 2009 10,006 were impacted				
Other (Health Epidemics)	Current	Epidemic Disasters occurred in 2001 & 1999. Over 2,000 people were impacted				

Insufficient Understanding	No Potential Impact	Low Potential Impact	Moderate Potential Impact	High Potential Impact
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2.3. Key Drivers of Impacts

Table 4 provides a summary of the key drivers of impact for each sector, in terms of hazards that are likely to pose the greatest challenge. It also highlights those hazards that transit from moderate to high impact in the future time frame. For example, sea-level rise may not be a key risk driver in the Historical/Current time frame; but emerge as a key driver across multiple sectors in the future time frame. Understanding which hazards are key drivers may be important in the context of managing climate risks for resilience.

Table 4: Key Drivers of Impacts

KEY DRIVERS OF IMPACTS		
SECTOR	HISTORICAL/ CURRENT DRIVERS	FUTURE DRIVERS
Energy	Extreme Temperature; Storm Surge	Extreme Temperature
	*	Sea Level Rise; Storm Surge
Agriculture	Extreme Temperature; Extreme Precipitation & flooding; Storm Surge; Landslide	*
	Drought	Extreme Temperature; Extreme Precipitation & flooding; Drought; Sea Level Rise; Storm Surge
Health and Other Social Services	Extreme Temperature; Drought; Landslide	Extreme Precipitation & flooding; Sea Level Rise; Storm Surge
	Other (Health Epidemics)	Extreme Temperature; Drought
Water	Extreme Temperature; Extreme Precipitation & flooding; Storm Surge; Landslide; Other (Health Epidemics)	Sea Level Rise
	Drought	Extreme Temperature; Extreme Precipitation & flooding; Drought; Storm Surge

* If a cell is blank it implies there is 'No high or moderate risks' identified from any hazard.

Key: High Risk Moderate Risk

2.4. National and Sector Institutional Readiness Scores (IRS)

Institutions play an important role in building adaptive capacity to address the potential impacts and risks climate change and disasters. In this tool, the ability to adjust to and cope with potential impacts is evaluated based on four key elements of an institution's adaptive capacity.

Table 5 presents an overview of Cote D'Ivoire's readiness to act on potential climate and geophysical impacts based on rapid assessment of capacity at the national and sector level. Aspects of the country's capacity that have higher readiness will contribute to Cote D'Ivoire's ability to cope with natural hazards, whereas aspects that have lower readiness could potentially benefit from investments that would tend to reduce risks presented by natural hazards.

The scoring for institutional readiness is done for the combined effect of all hazards, since the effects of institutional readiness are not hazard-specific. For example, when an institution enhances its procedures for infrastructure maintenance and risk management procedures, it could improve its formal capacity to counter multiple hazards such as temperature, precipitation or drought. The scores are summed across each topic into a total institutional readiness score at the national and sector levels. It is useful to look assess the capacities of the key sectors, not just in terms of the total capacities, but where these are strong, and where they need to be strengthened. This also allow leveraging synergies across sectors (e.g. for awareness), while recognizing that the nature of adaptation measures may require more customized adaptation capacity for each sector (e.g. design standard for roads; agricultural extension services for farms etc.).

Table 5: National and Priority Sector Readiness Scores

CAPACITY READINESS ASPECTS	NATIONAL LEVEL CAPACITY	ENERGY CAPACITY	AGRICULTURE CAPACITY	HEALTH AND OTHER SOCIAL SERVICES CAPACITY	WATER CAPACITY
Awareness of Climate and Geophysical Hazards	2-Moderate	2-Moderate	3-Significant	1-Minimal	3-Significant
Ability to Conduct Risk and Impact Assessments	2-Moderate	1-Minimal	2-Moderate	1-Minimal	1-Minimal
Ability to Plan and Implement Adaptation Measures	2-Moderate	2-Moderate	2-Moderate	1-Minimal	2-Moderate
Adaptive Management Capabilities	2-Moderate	3-Significant	2-Moderate	2-Moderate	2-Moderate
Total Institutional Readiness Score	8-Moderate	8-Moderate	9-Significant	5-Moderate	8-Moderate

The radar diagram below presents the above Institutional Readiness Scores for Cote D'Ivoire at the national level and sector level based on the rapid assessment. Each axis of the 'spider diagram' depicts the score for each of the four questions related to institutional readiness. If a previous scoring is available, it is presented in Table 6, which could provide information to track progress and changes in institutional readiness for a Country over time.

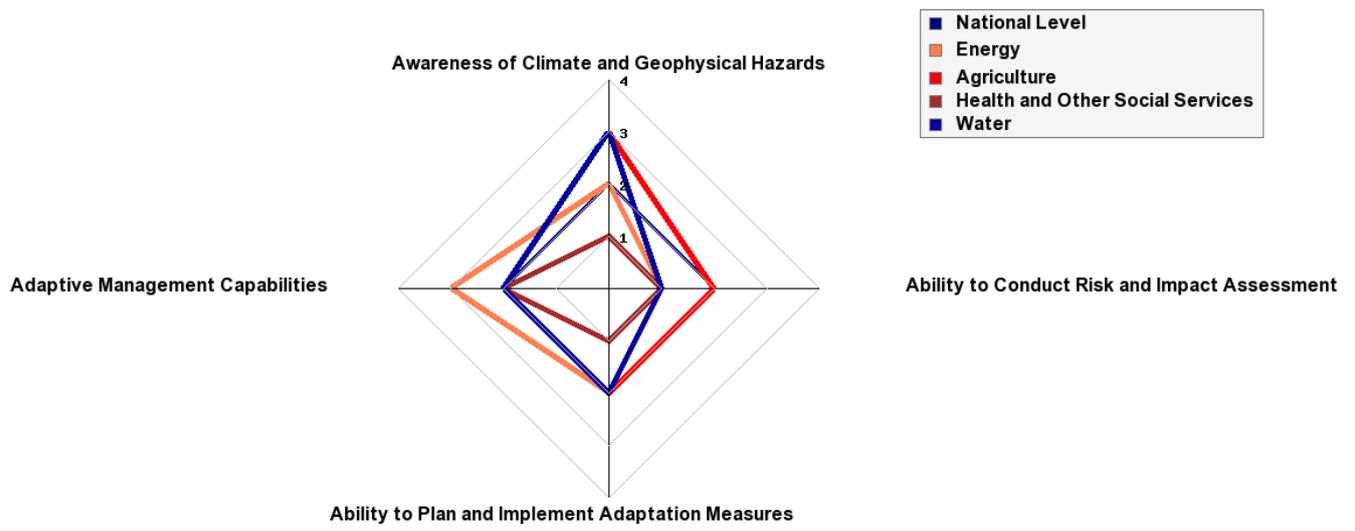


Table 6: Institutional Readiness Prior Results

	NATIONAL	ENERGY	AGRICULTURE	HEALTH AND OTHER SOCIAL SERVICES	WATER
Current Scores	8	8	9	5	8
PREVIOUS SCORE	NATIONAL	ENERGY	AGRICULTURE	HEALTH AND OTHER SOCIAL SERVICES	WATER
N/A	N/A	N/A	N/A	N/A	N/A

3. Summary of Overall Sector Risks

Table 7 presents the overall risk to each sector, based on climate and geophysical hazards and sector potential impact, but adjusted for the sector's institutional readiness and for the challenges and opportunities presented by the larger development context. The results indicate where there are potential risks based on this early concept review. Further consultations, diagnosis, and studies may be required to identify and ultimately reduce the risks posed by climate change and other natural hazards.

Important to pay attention to:

- **Overall Sector Risk** - The sectors that show moderate to high risk from climate and geophysical hazards will likely require attention if country goals are to be realized. Sectors that underpin multiple goals may deserve closer more attention.
- **Key Drivers of Impacts** - Focusing attention on the key drivers of impact - the key hazards that pose the biggest potential threat to the sectors - will help design programs to meet priority needs. Understanding which hazards become more adverse over time, and addressing those drivers which impact multiple sectors may allow for more effective management of risks.
- **Institutional Readiness** - Addressing weaknesses in any of the institutional capacity topics (Awareness, Impact Assessment, Adaptation Planning, or Adaptive Management) may help increase the country's ability to understand and address the most important potential impact drivers and therefore reduce overall sector risk. For example, the ability to plan and implement agricultural policies and programs such as rural credit scheme and crop pricing policies which consider adaptation proactively, will clearly reduce the risks within the sector.
- **Development considerations** - Important to pay attention to the larger sector and development context to understand how climate and disaster risks can be modulated. For example, in the agriculture access to technology, or land ownership issues may reduce the risk to the sector if these are well managed; while a larger conflict situation may aggravate the risks.
- **Sub-national Risk** - Where priority locations of importance were identified for sectors, this will provide some insights on which geographic areas may deserve more attention.

Table 7: Overall Sector Risk

	ENERGY		AGRICULTURE		HEALTH AND OTHER SOCIAL SERVICES		WATER	
	Historical/ Current	Future	Historical/ Current	Future	Historical/ Current	Future	Historical/ Current	Future
Potential Impact								
Extreme Temperature								
Extreme Precipitation and Flooding								
Drought								
Sea Level Rise								
Storm Surge								
Strong Winds								
Landslide		X		X		X		X
Other (Health Epidemics)		X		X		X		X
Overall Sector Potential Impact								
Institutional Readiness Score								
8-Moderate			9-Significant		5-Moderate		8-Moderate	
Preliminary Sector Impact								
Development Context Considerations								
	<ul style="list-style-type: none"> • Access to technology : Decreases risk • Political instability : Decreases risk • Population growth : Increases risk • Urbanization : Increases risk 		<ul style="list-style-type: none"> • Access to technology : Increases risk • Prices (particularly food and energy) : Increases risk • Land and soil quality : Does not affect risk • Population growth : Increases risk • Pollution : Increases risk • Urbanization : Increases risk 		<ul style="list-style-type: none"> • Nutrition : Increases risk • Education : Decreases risk • Political instability : Decreases risk • Population growth : Increases risk • Urbanization : Increases risk • Other (Infrastructure) : Increases risk 		<ul style="list-style-type: none"> • Access to technology : Decreases risk • Population growth : Increases risk • Pollution : Increases risk • Urbanization : Increases risk 	
Overall Sector Risk								

Insufficient Understanding	No Potential Impact	Low Potential Impact	Moderate Potential Impact	High Potential Impact
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4. Next Steps

By understanding which of your country’s national development goals is most at risk from climate change and other natural hazards, you can begin to take measures to avoid these impacts by:

- Using your risk screening analysis to inform strategic discussions about priorities for WBG and/or other development interventions, through follow-up analysis and diagnostics for key risks.
- Guiding the establishment of more climate resilient national development goals in the planning processes and documents.
- Applying the information learned here about climate and disaster risks, both national and sectoral, at the project level, using the Project Level Screening Tools.

The greatest value of tool is that it provides a structured & systematic process for understanding climate and disaster risks. The actual rating, while instructive, should inform consultation, dialogue, and diagnostic studies or assessments. Please recall that that this is a high-level due diligence tool, and the characterization of risks should be complemented with more detailed work.

It is best to revisit the outputs from this National Climate and Disaster Risk Screening Tool on an occasional basis. The results can be strengthened significantly by engaging country and sectoral experts in workshops or other settings.

Annex 1: Tool Approach

The framework below describes the approach taken to screen the country. Climate and natural hazards information used to screen the project is most likely obtained from the World Bank's Climate Change Knowledge Portal, which houses numerous global data sets with both historical records and future projections and adaptation profiles.

Figure A1: National Level Climate and Disaster Risk Screening Tool: Approach

