



RISK ASSESSMENT IN WEST AFRICA: A HANDBOOK FOR PRACTITIONERS

RISK ASSESSMENT REPORT TEMPLATE

VERSION I
(August 2017)



UNITED NATIONS
UNIVERSITY
UNU-EHS
Institute for Environment
and Human Security



Report Template

WASCAL RISK ASSESSMENT REPORT

Intro
duction

Step 1
Planning the
assessment

Step 2
Hazard
assessment

Step 3
Vulnerability
assessment

Step 4
Risk
assessment

Title of the assessment:

Date (last modified):

Filled by:

Affiliation:

Submitted to:

Date of submission:

Step 1: Understanding and planning the vulnerability and risk assessment

Step 1.1 What is the purpose of the assessment?

Step 1.2 Which area will be assessed?

Check the box(es) that describe your study area.

- ☐ Neighborhood(s)
- ☐ City
- ☐ Province
- ☐ Country
- ☐ Watershed
- ☐ River basin
- ☐ Urban
- ☐ Rural
- ☐ Other (specify): _____

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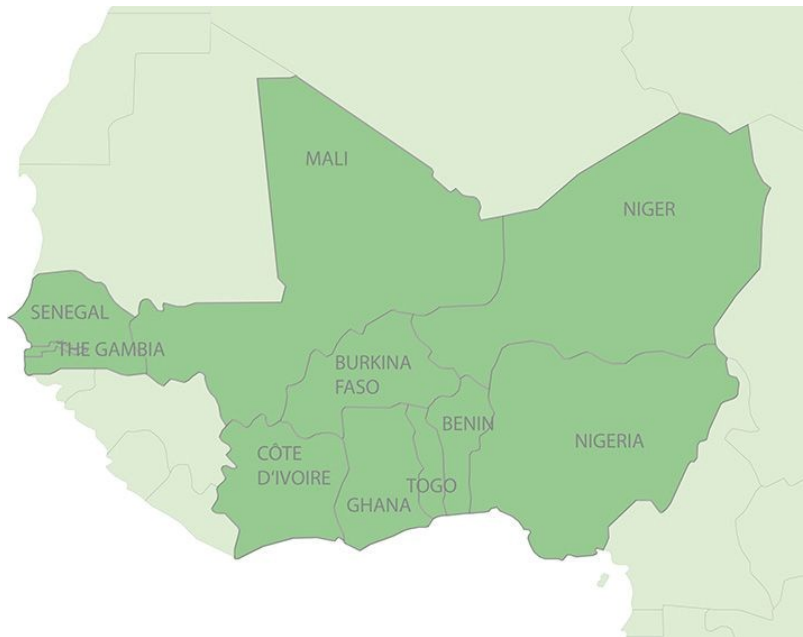
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To situate your assessment in the context of WASCAL member countries, mark your study area with an X in the map below.



Following the guidelines provided in the handbook (Part I, Box 1), create an image of your study area and insert it into the field below.

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Document the URL of the image (Google Maps) or insert a link to your KMZ file (Google Earth) into the fields below.

URL: _____

KMZ: _____

Step 1.3 What system components will be assessed?

Human

- ☐ Population
- ☐ Technology
- ☐ Governance
- ☐ Economy
- ☐ Other (specify): _____

Environmental

- ☐ Hydrology
- ☐ Soils and vegetation
- ☐ Biodiversity
- ☐ Atmosphere and climate
- ☐ Other (specify): _____

Step 1.4 Which sectors need to be involved?

- ☐ Horticulture
- ☐ Livestock
- ☐ Forestry
- ☐ Aquaculture and fisheries
- ☐ Infrastructure
- ☐ Energy supply
- ☐ Water management (collection, treatment, supply)

- ☐ Tourism
- ☐ Commerce
- ☐ Services
- ☐ Education
- ☐ Healthcare
- ☐ Transportation
- ☐ Disaster management
- ☐ Other (specify): _____

Step 1.5 What time frame will the assessment use?

Hazard assessment: from: _____ to _____

Vulnerability assessment: from: _____ to _____

Step 1.6 Human resources and professional expertise

Use the table below to answer the following questions:

- What human resources will be assigned to the assessment? (e.g. employees, consultants, volunteers)
- What professional expertise do they have? (e.g. GIS-analysis, disaster risk management, social science background)
- How much time can they dedicate to the project? (e.g. hours/week, total hours)

Personnel	Professional expertise	Time	Observations

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Step 1.7 Work plan

How much time is available for the conduction of the assessment?

Beginning of activities: _____

Date of delivery: _____

Total time available (e.g. weeks, workdays): _____

Use the table below to create a work plan by assigning the time (days, weeks) available for each task.

Time Task											

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What material resources (e.g. computers, software) are available for the conduction of the assessment? What additional material resources are planned to be acquired (purchased, lent) for the conduction of the assessment?

Available

To be acquired

[illegible]

Based on the human and material resources that will be used for the project, plan the necessary budget for conducting the assessment by filling the table below.

Resources	Quantity	Unitary cost	Total cost
		Total:	

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Step 1.9 Who should be consulted during the assessment?

Make a list of key stakeholders that need to be involved

Name	Institution / Organization	Contact information	Additional remarks

Step 1.10 Who will be the end user of the assessment?

Document briefly the target groups and end users that will benefit from the assessment.

Step 1.11 What outcomes do you intend to deliver at the end of the assessment?

Check all the boxes that apply.

- | | |
|--|---|
| <input type="checkbox"/> Hazard extent map | <input type="checkbox"/> List of vulnerability indicators |
| <input type="checkbox"/> Hazard severity map | <input type="checkbox"/> Vulnerability map |
| <input type="checkbox"/> Hazard event database | <input type="checkbox"/> Risk map |
| <input type="checkbox"/> Web of impacts on vulnerability to multiple hazards | <input type="checkbox"/> Risk profiles |
| <input type="checkbox"/> Coping and adaptation strategies based on scenarios | <input type="checkbox"/> Other (specify):
_____ |

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Step 2: Identifying and assessing hazards

Step 2.1 Identifying hazards

Which of the following hazards have affected the study area within the defined time frame? Check all the boxes that apply. Highlight the hazards that will be considered in the assessment.

- ☐ Drought ☐ Dry spell ☐ Flood ☐ Standing flood ☐ Riverine flooding
☐ Coastal flooding ☐ Flash flood ☐ Deluge ☐ Other (please specify):

Step 2.2 Assessing hazards

Which option(s) will be used for the hazard assessment? Check all the boxes that apply.

- ☐ Hazard event inventory (Step 2.2 – Option 1)
☐ Participatory hazard mapping (Step 2.2 – Option 2)
☐ Remote sensing based hazard mapping (Step 2.2 – Option 3)

* Fill the following subsections (Step 2.2 – Option 1, Step 2.2 – Option 2, Step 2.2 – Option 3) according to the methods selected. Skip sections that do not apply for your assessment.

Step 2.2 - Option 1: Hazard event inventory

Use the table below to answer the following questions:

1. Collect data on hazard events and impacts from local, regional and national disaster risk management agencies and other databases.

- Where do you expect to obtain data for your hazard assessment? (e.g. agencies, websites)
- Which types of data on which hazards are provided by each of the selected sources? (e.g. droughts, floods; location, frequency)
- What data provided by each of the selected sources can be used for the assessment of hazards in your study area?

Data source (website / agency)		Hazards addressed & type of data provided	Data available for the study area	Additional remarks
Name	URL / Contact info			

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2. Establish a database to store data in a structured way.

Create an electronic database or use the provided template of the MS Access database.
Insert a path where database is stored to the document into the field below:

Step 1 Planning the assessment

3. Synthesize and document results of data collection.

Follow the steps provided in the handbook (part I) to analyze your data. Use the table below to document your results by providing a summary according to the following questions:

Step 2 Hazard assessment

- In which localities (e.g. villages, communities, neighborhoods) of the study area were the selected hazards registered within the defined time frame?
- How many times did the event(s) occur?
- What were the major impacts due to the hazard event(s)? How severe were the impacts they produced? If information is available, please quantify the loss and damage.

Step 3 Vulnerability assessment

Locality (name, code, geographic coordinates)	Hazard	Frequency of events	Severity / Intensity of events	Observations

Step 4 Risk assessment

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Step 2.2 - Option 2: Participatory hazard mapping

Use the guidelines provided in the handbook (part 1) to conduct a participatory hazard mapping. Document the results for each locality (e.g. village, community, and neighborhood) by following the steps below:

1. Identify the locality (name, geographic coordinates)
2. Take pictures of the locality's demarked map and insert it into the field
3. Fill the table with information provided by the participants for each demarked area (hazard type, date(s) of hazard occurrence, impacts due to hazard)

Location 1: _____

Name: _____

Geographic coordinates: _____

Map:

Area	Hazard type	Date of hazard occurrence	Impacts due to hazard	Additional remarks
1				
2				
3				
4				
5				

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Location 2: _____

Name: _____

Geographic coordinates: _____

Map:

Area	Hazard type	Date of hazard occurrence	Impacts due to hazard	Additional remarks
1				
2				
3				
4				
5				

Location:

For additional locations take a separate sheet and append here.

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Step 2.2 - Option 3: Remote sensing based hazard mapping

1. Identify appropriate EO data for your study.

- Which sensor type do you need?

- Do the data have to be free of charge or do you have a budget?

- At which resolution do you want to work?

- Which area do you want to cover?

2. Acquire selected EO data

Documentation of selected EO data for hazard assessment		
1	Spatial extent	
2	Date or time span	
3	Select sensor	
4	Use filter to find appropriate data	

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3. Process EO data to detect hazard events, including spatial extents, duration, frequency and severity

- Which pre-processing steps do your data or your application need?

4. Calculate hazard characteristics

1	Define relevant weeks for drought assessment	
2	Subset the yearly dataset	
3	Extract land use areas to be investigated	
4	Create drought mask for each week	
5	Calculate drought duration	
6	Delineate drought area per year	
7	Calculate drought frequency	
8	Calculate drought intensity	
9	Calculate drought severity	

5. Validate

- What is the accuracy of the derived hazard maps?

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6. Interpret and document resulting maps

- Can you interpret location, duration, severity and frequency of droughts?

Provide the resulting map(s) here

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Step 3: Conducting the vulnerability assessment

Step 3.1 Guiding questions to pose for vulnerability assessment

By answering the questions below, create a summary of information provided in steps 1 and 2 that will guide you in the vulnerability assessment.

- What is the hazard that is linked to vulnerability? (2.1)
- What is the object of analysis? (see 1.3, 1.4)
- Who should be informed based on the final result of the vulnerability assessment? (see 1.10)
- What will the assessment be used for? (see 1.1)

Vulnerability TO WHAT?	Vulnerability OF WHAT?	Assessment FOR WHOM?	Assessment FOR WHAT PURPOSE?
<input type="checkbox"/> Flood <input type="checkbox"/> Flash flood <input type="checkbox"/> Drought <input type="checkbox"/> Dry spell <input type="checkbox"/> Other (specify): _____			

Step 3.2 Option 1: Understanding vulnerability based on narratives

1. Preparation of semi-structured interviews

Which of the proposed “well-being” categories will be addressed in your semi-structured interviews? Elaborate questions or list key-words that will help you obtain the information needed.

- ☐ (1) Livelihoods

- ☐ (2) Access to essential resources (i.e. fuel and water)

- ☐ (3) Housing

- ☐ (4) Health

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☐ (5) Education

☐ (6) Transportation

☐ (7) Social relations

☐ (8) Happiness

☐ (9) Politics and Governance

☐ (10) Technology

☐ (11) Beliefs and customs

☐ (12) Other (specify): _____

☐ (13) Other (specify): _____

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2. Select interviewees

In which localities (e.g. villages, communities, neighborhoods) will interviews take place? Create a list on the table below, informing also which hazard(s) will be addressed and how many individuals will be consulted in each locality.

Locality	Hazard(s) addressed	Number of interviews	Additional remarks

4. Synthesize and document results of semi-structured interviews

After conducting the interviews and documenting the results as recommended in the handbook (part I), document the main findings in the below tables:

Number of impacts cited per interview category (based on the well-being categories):

Categories		Hazard 1:	Hazard 2:
(1) Livelihood			
(2) Access to essential resources	Fuel		
	Water		
(3) Housing			
(4) Health			
(5) Education			

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(6) Transportation		
(7) Social Relations		
(8) Happiness		
(9) Politics and governance		
(10) Technology (e.g. machines)		
(11) Beliefs and customs		
(12)		
(13)		

Summarize the impacts of each hazard by type, according to the description provided by interviewees:

Description of interviewee with regard to experienced damage/impact	Count of impacts (hazard 1:)	Count of impacts (hazard 2:)	Total of impacts (all hazards)

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Following the guidelines provided in the handbook (Part I, Figure 5) and based on the information synthesized in the above tables, draw and describe a web of impacts in the fields below:

Web of impacts:

Description:

Document on the table below the coping and adaptation strategies reported or identified during the interviews. The dashed line allows you to differentiate between strategies related either to coping or adaptation (fill line) or to both (leave fields together).

Coping strategies	Adaptation strategies

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Step 3.2 - Option 2: Understanding dynamics of vulnerability based on scenario analysis

1. Prepare scenarios

List below the most important capitals that influence the vulnerability of society and ecosystem, e.g. the main crops and livestock produced in your study area.

What scenarios were created for the game? Describe them briefly in the fields below.

Scenario 1:

Scenario 2:

Step 4 Risk assessment

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3. Select the role play participants and play the game

What are the prerequisites for participation in the board game? (e.g. previously affected by hazard, involved in agriculture). Based on each prerequisite, prepare a question to be asked in the process of selecting the participants.

Prerequisite	Question

4. Synthesize and document results of (scenario-based) game processes.

Following the rules described in the report template above, play the scenario board game. Record the activity in the pro-forma sheets (Pardoe, 2016, p,229) and, later, summarize and document the results by completing the fields below. In the below table, document the main coping and adaptation strategies anticipated by players for each scenario.

Player 1.....	Coping strategies	Adaptation strategies
Scenario 1		
Scenario 2		

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Player 2.....	Coping strategies	Adaptation strategies
Scenario 1		
Scenario 2		

Step 3.2 Option 3: Quantifying vulnerability based on indicators

1. Select a conceptual framework and review existing indicators related to the hazard(s)

What indicators might be suitable and useful for your assessment? List the indicators selected from the provided library or other sources by checking the fields below.

Exposure of social system

- ☐ Agricultural dependent population
- ☐ Insecure settlement
- ☐ Physical infrastructure
- Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

Exposure of ecological system

- ☐ Insecure Farms
- ☐ Agricultural Area
- ☐ Protected Area
- Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

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Susceptibility of social system

- ☐ Number of dependents
- ☐ Population density
- ☐ Quality of Housing
- ☐ Distance to water
- ☐ Distance to food market
- ☐ Prevalence of stunted children
- ☐ Caloric intake per Capita
- ☐ Female headed households
- ☐ Prevalence of poverty
- ☐ Household size

Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

Susceptibility of ecological system

- ☐ Degraded areas
- ☐ Runoff rates
- ☐ Crop type
- ☐ Dry season duration
- ☐ Erosion rates

Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

Capacity, ecosystem robustness

- ☐ Soil Organic Matter (SOM)
- ☐ Water holding capacity
- ☐ Bas fonds
- ☐ Infiltration rate
- ☐ Green Vegetation Cover (GVC)
- ☐ Groundwater level (GWL)
- ☐ Agroforestry cover
- ☐ Soil depth
- ☐ Normalized Difference Vegetation Index (NDVI)

Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

Capacity, Adaptive capacity

- ☐ Access to agricultural extension service
- ☐ Household income per annum
- ☐ Literacy rates
- ☐ Number of herds per household
- ☐ Gross margin per hectare
- ☐ Good leadership & management
- ☐ Access to farm labour
- ☐ Access to land or land ownership

Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

Capacity, Coping capacity

- ☐ Alternate food and income source
- ☐ Ability to survive crisis
- ☐ Social capital
- ☐ Local knowledge
- ☐ Emergency management committee (EMC)
- ☐ Relief period of emergency items

Others (specify):

- ☐ _____
- ☐ _____
- ☐ _____

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2. Conduct technical workshops with different groups of experts

In the table below, make a list of experts and institutions selected to participate in the technical expert workshop.

Remark: During the acquisition of personal or institutional data, make sure that you consider the ethical standards with regard to data collection, processing and publication. An example of ethical considerations is provided in Pardoe 2016.

Name	Institution / Organization	Contact information	Additional remarks

In the table below, make a list of experts and institutions selected to participate in the technical expert workshop.

Technical group Name and affiliation of participants	(1) Agriculture	(2) Socio-economic & health	(3) Disaster management & meteorology	(4) Environment	(5) Other (specify): _____

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3.Elicitation and ranking of indicators

What information do you intend to obtain from each technical group? Elaborate questions or list key-words that will help you plan your semi-structured interviews. Then use them to design your questionnaires, which you can later attach to this report.

Technical group 1: Agriculture

Technical group 2: Socio-economic and health matters

Technical group 3: Disaster management and meteorology

Technical group 4: Environment

Technical group 5:

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4. Collect data to inform selected indicators

Use the table below to complete the following steps:

Document the final selection of indicators, as well as the relevance of each of them in the local context (expert-based ranking). The information is an outcome of the technical expert workshop. In addition, list potential sources of data that can be used to inform the selected indicators (see the indicator library for suggestions).

✓/×	Exposure of elements in the social system	Result of expert-based ranking	Data source used to inform indicator
	Agricultural dependent population		
	Insecure settlement		
	Physical infrastructure		

✓/×	Exposure of elements in the environmental system	Result of expert-based ranking	Data source used to inform indicator
	Insecure Farms		
	Agricultural Area		
	Protected Area		

✓/×	Susceptibility of social system	Result of expert-based ranking	Data source used to inform indicator
	Number of dependents		
	Population density		
	Quality of Housing		
	Distance to water		
	Distance to food market		
	Prevalence of stunted children		
	Caloric intake per Capita		
	Female headed households		
	Prevalence of poverty		
	Household size		

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✓ / x	Susceptibility of ecological sub-system	Result of expert-based ranking	Data source used to inform indicator
	Degraded areas		
	Runoff rates		
	Crop type		
	Dry season duration		
	Erosion rates		

Step 2 Hazard assessment

✓ / x	Capacity, ecosystem robustness	Result of expert-based ranking	Data source used to inform indicator
	Soil Organic Matter (SOM)		
	Water holding capacity		
	Bas fonds		
	Infiltration rate		
	Green Vegetation Cover (GVC)		
	Groundwater level (GWL)		
	Agroforestry cover		
	Soil depth		
	Normalized Difference Vegetation Index (NDVI)		

Step 3 Vulnerability assessment

Step 4 Risk assessment

✓ / x	Capacity, Coping capacity	Result of expert-based ranking	Data source used to inform indicator
	Alternate food and income source		
	Ability to survive crisis		
	Social capital		
	Local knowledge		
	Emergency management committee (EMC)		
	Relief period of emergency items		
	Access to agricultural extension service		
	Household income per annum		
	Literacy rates		
	Number of herds per household		
	Gross margin per hectare		
	Good leadership & management		
	Access to farm labour		
	Access to land or land ownership		

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Display here the result of aggregating and mapping the individual components of vulnerability and provide the link to the electronic sheet, which was used to calculate and aggregate the indices.

Document the location and filename of the MS Excel used to calculate and aggregate the vulnerability indices:

Exposure map:

Susceptibility map:

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Lack of capacity map:

Vulnerability map:

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Step 4: How to measure risk?

Step 4.1 Compiling risk from hazard and vulnerability measures

Note here the location and name of the MS Excel file, which contains the calculation of the risk index.

Filename and location: _____

Display the resulting risk map of your study area here:

Risk map:

Step 4.2 Validation of risk-based on the Community Impact Score (CIS)

Document the impact variables with the respective units of measurement (e.g. %) and the formula used for calculating the CIS:

Variable name	Unit of measurement

Formula used for calculating the CIS: _____

Resulting RMSE: _____

Resulting R²: _____

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Step 4.3 Generation of risk profiles

This documentation step is only relevant for the derivation of the digital risk profiles, if the quantitative approach based on digital data was selected in this assessment. Export the files as recommended and insert links to the resulting documents into the fields below:

Document the path to the .CSV file (raw indicator values):

Document the path to the .CSV file (indicator acronyms and categories):

Following the guidelines provided in the handbook, generate the risk profile of each spatial unit (e.g. community) of your study area. Export the profiles as images and insert them into the fields below. The description of the location of the risk profile needs to be identical with the description of the spatial units in the overview map of the study area:

Overview map (see risk map above) with all names of the single units that are represented (e.g. names of communities):

Overview map:

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Risk profile of location 1: _____

Risk profile:

Risk profile of location 2: _____

Risk profile:

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Add more here

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Risk profile:



Imprint

Picture credits: UNU-EHS/ Yvonne Walz

Icon credits: Freepik and Nikita Golubev from www.flaticon.com

Design: Ruby, Fang-Ju Lin

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IN WEST AFRICA:
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DLR

