

東アフリカ共同体

アフリカ地域
東アフリカ共同体における
災害リスクマネジメント戦略策定に係る
情報収集・確認調査

ファイナル・レポート

平成 24 年 10 月
(2012 年)

独立行政法人
国際協力機構 (JICA)

株式会社 地球システム科学
いであ株式会社

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略 語 集

AfDB	African Development Bank (アフリカ開発銀行)
AU	African Union (アフリカ連合)
CSO	Civil Society Organization (市民社会組織)
DRM	Disaster Risk Management (災害リスクマネジメント)
DRR	Disaster Risk Reduction (災害リスクマネジメント)
EAC	East African Community (東アフリカ共同体)
EWS	Early Warning System (早期警報システム)
FEWS NET	Famine Early Warning Systems Network (食糧飢饉早期警戒システムネットワーク)
GFDRR	Global Facility for Disaster Reduction and Recovery (世界銀行防災グローバルファシリティ)
HFA	Hyogo Framework for Action (兵庫行動枠組み)
IGAD	Intergovernmental Authority on Development (政府間開発機構)
JICA	Japan International Cooperation Agency (日本国際協力機構)
NGOs	Non-Governmental Organizations (非政府組織)
SADC	Southern African Development Community (南部アフリカ開発共同体)
UN	United Nations (国際連合)
UNDP	United Nations Development Programme (国連開発計画)
UNEP	United Nations Environment Programme (国連環境計画)
UNISDR	United Nations International Strategy for Disaster Reduction (国連国際防災戦略)
UNOCHA	United Nations Office for Coordination of Humanitarian Affairs OCHA (国連人道問題調整部)
USAID	United States Agency for International Development (米国国際開発庁)
WB	World Bank (国際銀行)
WMO	World Meteorological Organization (世界気象機関)

<ブルンジ>

IGEBU	Institut Géographique du Burundi (Geographical Institute of Burundi) (ブルンジ地理院)
INECN	Institut National pour l'Environnement et la Conservation de la Nature (National Institute for Nature Conservation and the Environment) (国家環境・自然保護局)

<ケニア>

CDMC	County Disaster Management Committee (県防災委員会)
MRDM	Ministry Responsible for Disaster Management (防災管理省)
NDCC	National Disaster Coordination Committee (防災調整委員会)
NDMP	National Disaster Management Policy (国家防災管理政策)
NEMA	National Environment Management Authority (国家環境管理委員会)

NDOC National Disaster Operation Center (国家防災センター)

<ルワンダ>

DDMC District Disaster Management Committee (地方災害管理委員会)
DMTF Disaster Management Task Force (災害管理特別委員会)
MIDIMAR Ministry of Disaster Management and Refugee Affairs (防災・難民省)
MINALOC Ministry of Local Government (地方政府省)
MINIRENA Ministry of Natural Resources (自然資源省)
NLC National Land Commission (国家土地委員会)
RBC Rwanda Biomedical Center (ルワンダ生体医学センター)
REMA Rwanda Environment Management Authority (ルワンダ環境管理局)

<タンザニア>

DIDMAC District Disaster Management Committee (区災害管理委員会)
DMTC Disaster Management Training Centre (災害管理研修センター)
DMD Disaster Management Department (災害管理局)
NEMC National Environment Management Council (国家環境管理委員会)
TMA Tanzania Meteorological Agency (タンザニア気象庁)
ZEPRP Zanzibar Emergent Preparedness and Response Plan (ザンジバル緊急予防・対応計画)

<ウガンダ>

CDMTC City Disaster Management Technical Committee (市防災技術委員会)
CDPC City Disaster Policy Committee (市防災政策委員会)
DDMTC District Disaster Management Technical Committee (県防災技術委員会)
DDPC District Disaster Policy Committee (県防災政策委員会)
NECOC National Emergency Coordination and Operation Centre (国家緊急対応調整・運営センター)

1. 調査の概要

1.1 背景および目的

気候変動に関する政府間パネル（Intergovernmental Panel on Climate Change: IPCC）の第4次評価報告書によると、東アフリカ地域は、気候変動の影響により洪水や干ばつの増加が危惧されており、かつ、予測される気候変化に対して適応能力が低いという問題点も指摘されている。

かかる状況に対処するため、2005年に国連防災世界会議において採択された「兵庫行動枠組み 2005-2015（以下、HFA）」に基づき、2011年1月のアフリカ連合総会において「アフリカ地域災害リスク削減戦略の実施に向けての行動プログラム 2006-2015」が採択されている。この行動プログラムは、アフリカの人々と経済に対する災害の社会経済・環境面のインパクトを軽減し、ミレニアム開発目標やほかの開発課題の達成に資することを目的とし、災害リスク削減に対する政治的コミットメントの強化、災害リスクの特定とアセスメント強化、災害リスク削減に対する社会の意識向上等の戦略的介入分野を特定している。

また、行動プログラムの運営メカニズムに関しては、アフリカ連合（African Union: AU）がアフリカの全体的な調整・促進、「災害リスク削減のためのアフリカ地域プラットフォーム」がモニタリング・情報共有、地域経済共同体（Regional Economic Communities: RECs）が加盟国各国に対する戦略的ガイダンスの提供及び実施促進、各国が実施という体制が災害リスク削減にかかるアフリカ大臣会合（2010年、ケニア・ナイロビ）などの場で提案されている。

こうした背景を受けて、東アフリカ共同体（East African Community: EAC、以下、EAC）は、EAC気候変動政策及び第4次開発戦略の中でHFAとアフリカ地域戦略の実施を重視する姿勢を示し、その戦略作成を急務と考えている。また、JICAは第5回アフリカ開発会議（Tokyo International Conference on African Development V: TICAD V）に向けて、アフリカにおける災害リスク削減に対する協力方針を検討するため、東アフリカ共同体各国における災害発生状況や災害管理体制等に関する基礎的な情報の収集と分析を必要としている。

本調査は、東アフリカ共同体（ケニア、タンザニア、ウガンダ、ブルンジ、ルワンダの5か国）を対象として、災害リスクマネジメントにかかる戦略案の策定に必要となる災害による被害状況、災害管理制度・体制などにかかる情報収集・分析を行い、当該分野の戦略案策定に必要となる調査結果を取りまとめることを目的として実施されたものである。

図1、図2はそれぞれEAC加盟国の位置図、年平均雨量（出典：Hijmans et al.,を編集）を示したものである。EAC加盟国は、アフリカ大陸の東部から中部にかけて位置しており、EAC加盟国の大部分は熱帯林地に属している^{*12}。年平均雨量はブルンジで1,272mm、ケニアで630mm、ルワンダで1,212mm、タンザニアで1,071mm、ウガンダで1,081mmであり、ケニアの年平均雨量は他の加盟国と比べて半分ほどとなっている^{*11}。

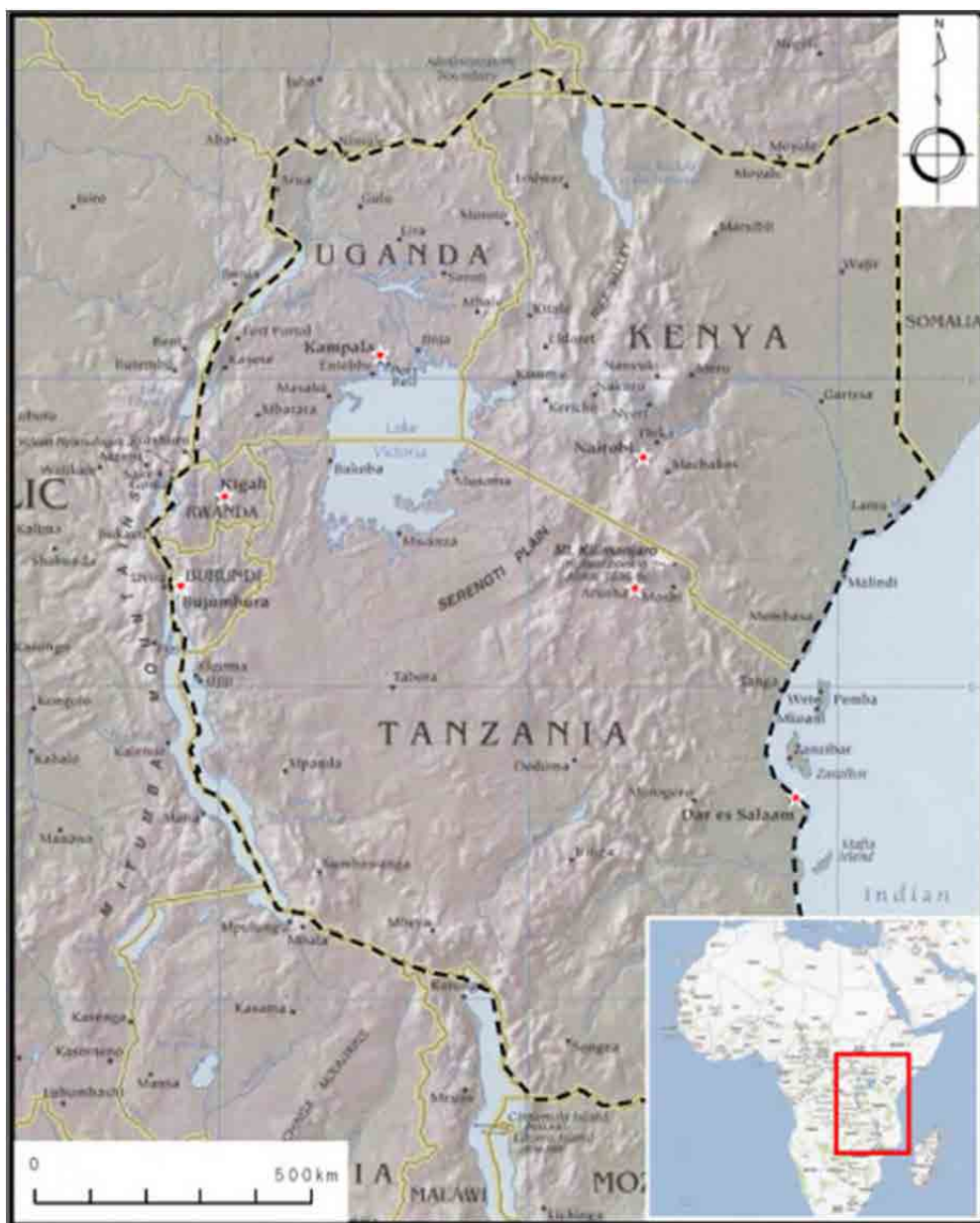


図 1 東アフリカ共同体(EAC)加盟国位置図

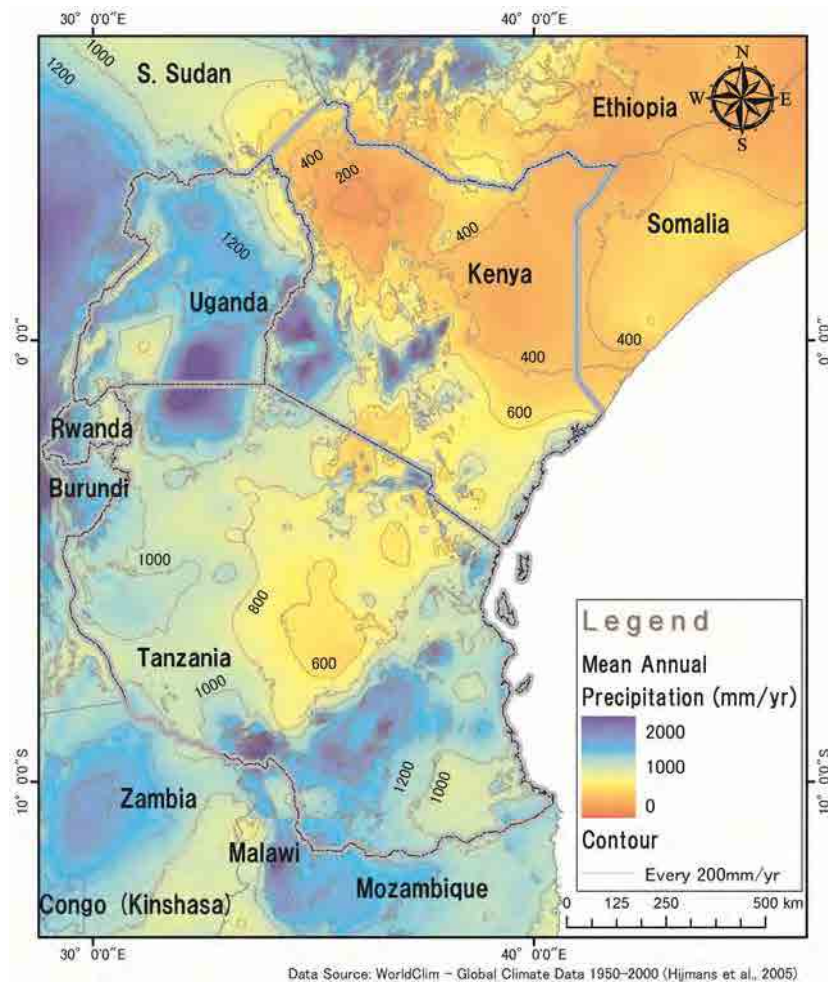


図 2 EAC 加盟国の年間降雨量平均値

1.2 調査団員の構成および調査工程

本調査は、東アフリカ共同体事務局生産社会総局環境天然資源部の調整のもとに、JICA 調査団により実施された。JICA 調査団の団員構成は、下表に示すようである。

表 1 JICA 調査団の構成

No.	担当	氏名	所属
1	総括／防災	富田 ゆきし	株式会社地球システム科学
2	洪水対策	臼井 陽典	いであ株式会社
3	干ばつ／気候変動	原 龍一	株式会社地球システム科学
4	調整／防災	Fredrick Chuwa	Don Consult Ltd., Tanzania (調査団により傭人雇用)

調査は2012年5月から開始され、同年10月末に終了した。調査工程は、図3に示すようである。調査期間中、3回のEAC地域での現地調査を実施している。3回の現地調査の日程および調査内容を表2から表4に記載した。

アフリカ地域東アフリカ共同体における災害リスクマネジメント戦略策定に係る情報収集・確認調査	
5月	国内事前準備 項目【1】 災害の現状と課題にかかる既存の情報収集・分析 項目【2】 災害リスクマネジメントの実施体制・実施状況にかかる既存資料収集・分析 項目【3】 開発政策・開発計画における災害リスクマネジメント・削減案の位置づけ等の整理・分析 項目【4】 災害情報管理システムの情報収集・分析 項目【5】 我が国の協力実績の確認及び既存のプロジェクトとの連携可能性の確認・分析 項目【6】 インセンション・レポートの作成～提出・説明
6月	第一次現地調査 項目【7】 第1回タスクフォース会合の開催支援及びインセンション・レポートの提出・説明 項目【8】 災害の現状と課題にかかる情報収集分析 項目【9】 政策面・制度面・組織面・予算面・人材面等の確認及び課題の分析 項目【10】 ヒアリングや協議による、災害・気候変動対策や緊急災害対策計画等の確認及び課題分析 項目【11】 国際機関・ドナー等の支援状況の確認
7月	国内整理作業 項目【12】 災害リスクに対する即応能力改善方法の整理・分析 項目【13】 地域の災害対応能力向上に資する体制整備の整理・分析 項目【14】 地域・各国レベルにおける災害情報管理システムの整理・分析 項目【15】 災害地域住民の災害対策に対する啓蒙方法の整理・分析 項目【16】 地域及び国際的な災害リスク・気候変動対策期間との連携方法の整理・分析 項目【17】 災害リスク対策向上に向けた優先課題の抽出及び災害リスクマネジメント戦略(DRMS)案の整理・提案 項目【18】 DRMS実施プログラム案の整理・提案 項目【19】 DRMS実現のための資金調達プログラムの整理・提案
8月	第二次 項目【20】 インテリム・レポート(戦略(案案))取りまとめ、提出・説明 項目【21】 加盟国内閣閣会および第2回タスクフォース会合の開催支援及びインテリム・レポート(戦略(案案))にかかる説明・協議
9月	国内整理作業 項目【22】 インテリム・レポート(戦略(案案))の再検討、ドラフト・ファイナル・レポート(戦略(案))の取りまとめ、提出・説明
10月	第三次 項目【23】 関係者ワークショップ開催支援及びドラフト・ファイナル・レポート(戦略(案))の説明・意見集約 項目【24】 帰国報告 項目【25】 「各国の防災情報一覧」及び概要版の更新(ケニア及びタンザニア)及び新規作成(ウガンダ、ルワンダ、ブルンジ) 項目【26】 ファイナル・レポート(戦略(最終案))取りまとめ、提出

図 3 調査工程

表 2 第一次現地調査日程及び調査内容

No.	日付	日程/調査内容		
		富田 ゆきし 総括/防災	白井 陽典 洪水対策	原龍一 干ばつ/気候変動
1	2012/6/2	土	ナイロビへ移動	
2	2012/6/3	日	ナイロビへ移動	
3	2012/6/4	月	団内会議	
4	2012/6/5	火	午前: JICAと協議(ケニア事務所) 午後: プルンジへ移動	
5	2012/6/6	水	午前: AUCにて防災会議 午後: タスクフォースミーティング、EACと調査日程について協議、IC/R 説明	
6	2012/6/7	木	午前: 公安省訪省、UNDP訪問 午後: 国連訪問	
7	2012/6/8	金	午前: プラットフォーム 午後: IGEBU訪問	
8	2012/6/9	土	ナイロビへ移動	
9	2012/6/10	日	収集資料整理	
10	2012/6/11	月	午前: 防災センター訪問 午後: NDMA訪問	
11	2012/6/12	火	水灌漑省訪問 WRMA訪問	
12	2012/6/13	水	ダルエスサラームへ移動 JICAタンザニアオフィス訪問、現地コンサルタント訪問	
13	2012/6/14	木	DMD訪問 作物モニタリング	
14	2012/6/15	金	TMA訪問 WOM訪問	
15	2012/6/16	土	現地調査	
16	2012/6/17	日	ウガンダへ移動	
17	2012/6/18	月	午前: JICA ウガンダ事務所 午後: 重要項目についての会議	
18	2012/6/19	火	午前: JICA ウガンダ事務所 午後: プラットフォーム	
19	2012/6/20	水	現地調査	
20	2012/6/21	木	アルーシャへ移動	ルワンダへ移動
21	2012/6/22	金	Kabibu (EAC)氏と協議	重要項目についての会議
22	2012/6/23	土	収集資料整理	現地調査
23	2012/6/24	日	収集資料整理	収集資料整理
24	2012/6/25	月	Kabibu (EAC)氏と協議	午前: 重要項目についての協議 午後: RNRA訪問
25	2012/6/26	火	Kabibu (EAC)氏と協議	MINAGRI訪問
26	2012/6/27	水	Tanzania (EAC)での調査	アルーシャへ移動
27	2012/6/28	木	収集資料整理	午前: 団内会議 午後: 現地調査
28	2012/6/29	金	収集資料整理	収集資料整理
29	2012/6/30	土	ナイロビへ移動	収集資料整理及び分析
30	2012/7/1	日	日本帰国	収集資料整理及び分析
31	2012/7/2	月		EACにて会議
32	2012/7/3	火		ナイロビへ移動
33	2012/7/4	水		収集資料整理及び分析
34	2012/7/5	木		現地調査
35	2012/7/6	金		DRR訪問 NDMA訪問
36	2012/7/7	土		現地調査
37	2012/7/8	日		収集資料整理及び分析
38	2012/7/9	月		JICA ケニア事務所訪問
39	2012/7/10	火		ドバイへ移動
40	2012/7/11	水		日本帰国

表 3 第二次現地調査日程及び調査内容

No.	No.	日付		日程/調査内容		
				富田ゆきし 総括/防災	臼井陽典 洪水対策	原龍一 干ばつ/気候変動
		2012/8/5	日			
		2012/8/6	月			
		2012/8/7	火			
		2012/8/8	水			
		2012/8/9	木			
		2012/8/10	金			
		2012/8/11	土			
	1	2012/8/12	日		ドバイへ移動	
1	2	2012/8/13	月	ドバイへ移動		ウガンダへ移動
2	3	2012/8/14	火	ナイロビへ移動		National Consultative Meeting (ウガンダ) /ナイロビへ移動
3	4	2012/8/15	水			National Consultative Meeting (ナイロビ)
4	5	2012/8/16	木	アルーシャへ移動		
5	6	2012/8/17	金	準備/EAC DRMS改訂		
6	7	2012/8/18	土	準備/EAC DRMS改訂		
7	8	2012/8/19	日	準備/EAC DRMS改訂		
8	9	2012/8/20	月	第二回タスクフォースミーティング		
9	10	2012/8/21	火	第二回タスクフォースミーティング		
10	11	2012/8/22	水	第二回タスクフォースミーティング		
11	12	2012/8/23	木	取りまとめ		
12	13	2012/8/24	金	EAC DRMS改訂		
13	14	2012/8/25	土	ナイロビへ移動		EAC DRMS改訂
14	15	2012/8/26	日	ドバイへ移動		EAC DRMS改訂
15	16	2012/8/27	月	日本帰国		EAC DRMS改訂
	17	2012/8/28	火			ナイロビへ移動
	18	2012/8/29	水			JICAと協議
	19	2012/8/30	木			ドバイへ移動
	20	2012/8/31	金			日本帰国
		2012/9/1	土			
		2012/9/2	日			

*National Consultative Meeting (タンザニア)は2012年8月7日、National Consultative Meeting (ルワンダ)は2012年8月8日、National Consultative Meeting (ブルンジ)は2012年8月10日に現地調査補助員の管理の元開催された。

表 4 第三次現地調査日程及び調査内容

No.	日付		日程/調査内容		
			富田ゆきし 総括/防災	白井陽典 洪水対策	原藤一 干ばつ/気候変動
	2012/10/1	月			
	2012/10/2	火			
	2012/10/3	水			
	2012/10/4	木			
1	2012/10/5	金	ドバイへ移動		
2	2012/10/6	土	ナイロビへ移動		
3	2012/10/7	日	アルーシャへ移動		
4	2012/10/8	月	EAC関係者とミーティング		
5	2012/10/9	火	戦略案策定準備		
6	2012/10/10	水	EAC関係者とミーティング		
7	2012/10/11	木	ステークホルダーミーティング		
8	2012/10/12	金	ステークホルダーミーティング		
9	2012/10/13	土	報告書作成作業		
10	2012/10/14	日	報告書作成作業		
11	2012/10/15	月	取りまとめ		
12	2012/10/16	火	取りまとめ		
13	2012/10/17	水	ナイロビへ移動		
14	2012/10/18	木	ドバイへ移動		
15	2012/10/19	金	日本帰国		
	2012/10/20	土			
	2012/10/21	日			
	2012/10/22	月			
	2012/10/23	火			
	2012/10/24	水			
	2012/10/25	木			
	2012/10/26	金			
	2012/10/27	土			
	2012/10/28	日			
	2012/10/29	月			
	2012/10/30	火			
	2012/10/31	水			

2. EAC 加盟国の災害および災害リスクマネジメントの現状

本章では、EAC および EAC 加盟国の災害および災害リスクマネジメントの現状調査結果について取りまとめている。本章に示されている情報は、文献調査、EAC 加盟国関連省庁や国際機関へのインタビューにより収集され、戦略（案）の取りまとめに際して開催された会議の各国代表により確認されたものである。

2.1 EAC 加盟国における災害

東アフリカ地域は洪水、干ばつ、地震、地すべり、強風、落雷、伝染病や病気の二次災害などの自然災害に対して脆弱である。干ばつと洪水は東アフリカにおいて最も頻繁に発生する災害であり、赤道付近の東アフリカ地域で発生する気候変動に起因した干ばつおよび洪水は発生回数のみならずその激しさも増している。また、東アフリカ地域は都市火災、環境破壊、水質汚染、HIV/エイズ、病気や伝染病の流行などの人災についても自然災害と同じくらい脆弱である。この項では同地域において頻繁に発生する災害に注目する。

2.1.1 頻繁に見られる災害

(1) 干ばつ

干ばつは EAC 加盟国の中で最も一般的でかつ甚大な被害をもたらす災害の一つである。特に加盟国の北部（ケニアおよびウガンダ）では干ばつが大きな被害をもたらしている。例えば、ケニアは、国土の 80% が乾燥または半乾燥地帯となっている。ケニアで発生する干ばつのパターンとしては 25-30 年おきに猛烈な干ばつが、そしてそれよりは程度の軽い干ばつが 10-15 年おきに起こっている。また、5 年から 7 年の間隔で穏やかな干ばつが発生しており、この干ばつの後には相当量の降雨がある。



写真 1 ケニアでの干ばつ

出典:

<http://wwalert.wordpress.com/tag/severe-drought-in-kenya/>

2008-2010 年に起こったケニアの干ばつは 370 万人に影響を及ぼしており、被害額は 121 億米ドル、復興に係る費用は 17.7 億 370 万米ドルと言われ、ケニアの経済成長に大きな打撃となっている。

2011 年の 7 月半ばから、猛烈な干ばつがアフリカの角を含む東アフリカ全域において発生している。過去 60 年間で最悪の干ばつといわれており、ソマリア、ジブチ、エチオピア、ケニアにおいて過酷な食糧危機が起きており、950 万人の命が危険に曝されている状況である^{*40}。

ウガンダでは6-7月に乾期と猛暑の影響による猛烈な干ばつがウガンダの北東部であるカラモジャ地方(Karamoja region)において起こっている。カラモジャ地方では5年おきに深刻な不作に悩まされている。サハラ砂漠が現状よりも南に拡大することでウガンダがこれまでよりも災害の影響を受けやすくなるのではないかと危惧されている。主として干ばつにより引き起こされた1993/1994年のウガンダ国の飢饉では、16の地域の180万人に影響をしている。

タンザニアでは、干ばつはおよそ4年毎に起こっており、360万人以上の人に影響を及ぼしている。最も頻繁に干ばつが起こっている地域は、北部から中部の地域である。2008年には、ザンジバルで大規模な干ばつが発生し、300,000人が被災している。タンザニア政府はこの干ばつに起因する食糧不足に対応するために、多額の資金を使用しなければならなかった。

ブルンジでは、干ばつは1998年以来直面した災害である。特に北部では2000年以降その状況は悪化している。干ばつによる死者および飢饉難民数は国家災害レベルの域に達し、飢餓のため人々はルワンダやタンザニアでの難民となっている。

ルワンダでは、過去何十年にもわたり周期的に干ばつが起こっている。近年では1998年から2000年の間の干ばつ、2002年から2005年は毎年干ばつが起こっており、食糧安全保障に影響を及ぼしている。更に、2004年には長引く干ばつの影響により北部にある湖の水位が低下し、低下した電力供給は、ルワンダで最初となる大きな電力危機を引き起こしている。したがって、干ばつは、関係主要セクターに悪影響を及ぼしている。

干ばつは、製造業、教育、国家安全保障、テロリズム、健康、水、衛生、農業、家畜、環境、森林、電力等の主要セクターに影響をもたらすため、干ばつによる経済損失および被害は全ての分野で考慮すべきものとなっている。

(2) 洪水

洪水も干ばつと同じく最も一般的でかつ甚大な被害をもたらす災害の一つである。



写真 2 タンザニアでの洪水

出典：タンザニア防災局 (Disaster Management Department)

ケニアでの洪水災害の記録によれば、最悪の洪水災害は、1961-1962 および 1997-1998 に記録されており、特に1997-1998の洪水は、最も激しく、広範囲で、かつ甚大な被害をもたらしている。この洪水は、世界の大部分の影響を与える気象パターンであるエルニーニョ現象に伴うものであった。

エルニーニョ現象では、ある地域では降雨が増え、また別の地域では干ばつが発生する等、いつもとは異なった気象パターンが発生する。

ウガンダでは、北部および東部が洪水常襲地帯である。

タンザニアでは 1980 年代から 15 回洪水が起こっており、洪水により 54 名が犠牲となり、800,271 名が被災している。近年、タンザニアでは、主として気候変動により都市部での洪水が増加している。洪水常襲地域は、本土では、モロゴロ(Morogoro)、ダル・エス・サラーム(Dar es salaam)、キリマンジャロ(Kilimanjaro)、海岸地域、ザンジバルでは西部都市地域である。

ブルンジでは洪水は三番目に大きな自然災害として考えられている。最も甚大な被害をもたらした洪水は、タンガニーカ湖(Lake Tanganyika)周辺で 1961 年から 1964 年に発生している。1964 年の 5 月から 6 月にタンガニーカ湖の水位は 4m 上がり、777.6m に達した。タンガニーカ湖沿岸のブジュンブラ(Bujumbura)やその他の郡(municipalities)、ブジュンブラ港や周辺の道路で氾濫した。この洪水の影響で、タンガニーカ湖周辺の経済は大きな打撃を受けている。1983 年および 1986 年にはブジュンブラが大きな洪水被害を受けている。この洪水は経済にも大きな被害をもたらし、その被害は 10 億ブルンジ・フランと言われている。1983 年洪水の主な損害は、家屋損壊、工業地帯への機械・機器の損害、企業の在庫の損害、ブジュンブラ港への被害であった。



写真 3 ブルンジ、ブジュンブラにあるカヨージャ川
(Kayosha River) での洪水

出典：JICA 調査団

洪水はルワンダでも頻繁に起こっており、過去 10 年その頻度は増加している。2012 年 1 月から 9 月の間に洪水により 34 名が死亡、家屋 1920 戸が全壊し、2387.7 ヘクタールのトウモロコシ、豆、バナナ、コメが全損の被害が出ている。全ての洪水で、インフラ被害および農業被害が生じ、環境悪化、住民の死亡および移転につながっている。

洪水は溺死の原因となるとともに、公共医療施設、例えば公共水源や公共衛生施設に被害をもたらす。これに加え、洪水は、水媒介性の疾病やマラリアの蔓延の引き金になるとともに、健康災害へのコミュニティの脆弱性を増大させる原因ともなっている。更に、洪水は、構造物、作物、動物を押し流し、居住地を水没させるなどにより物理的損害を引き起こしている。このように洪水は多くの主要セクターにも影響を及ぼしている。

(3) 地すべり

地すべりや土石流は、大量の地塊(土砂や岩)が速い速度で急激に、または地塊がゆっくりと移動する現象である。通常激しい降雨や割れた岩盤から大量の地下水が流れ出し、表層の土砂や堆積物を押し流す。地すべりや土石流は予想することが非常に難しいが、発生頻度やその規模は、地質的、地形学的、水文学的状況や気象状況、植生の被覆状況等を考慮して予測することが可能である。ウガンダでは地すべりは重大な被害をもたらす災害の一つである、特にエルゴン山(Mt. Elgon)地域は地すべりに対して脆弱である。2012 年 6 月 25 日、地すべりが発生し、8 人の犠牲者をだした。最悪のケースは 2010 年に起こり、激し

い降雨がもたらした地すべりで 300 名以上の人々が命を落とした。ケニアでもエルゴン山周辺の状況はほぼ同じである。

ブルンジでは、地すべりはここ数十年で自然災害として認知されており、社会経済に及ぼす影響は増加している。1996 年、ブジュンブラでは地すべりによっておこった国道 1、4、7 号線断絶によりほぼ孤立するという事態が起こった。国道 7 号線で発生した地すべりでは 2 台の車が飲み込まれ、1 名が犠牲となった。

タンザニアでは、地すべりは緩んだ勾配の急な丘地形の場所で一般的で、全災害の 0.9% が地すべりはとなっている。

地すべりはエルゴン山、ケニア山、キリマンジャロ山などの傾斜の高い地域や大地溝帯沿いの急な傾斜で起こっており、主要道路を断絶、あるいは他のインフラに損害を及ぼし、社会経済の発展に影響を及ぼしている。



写真 5 ウガンダでの地すべり

出典：

<http://www.kfm.co.ug/news/over-3000-people-at-risk-in-bududa.html>



写真 4 ルワンダでの地すべり

出典：災害管理・難民省(Ministry of Disaster Management and Refugee Affairs : MIDIMAR)

(4) 雷

気候変動に関して、EAC 加盟国では気候のパラツキや変化の結果として、極端な気象・天候の再発が強度および頻度ともに増加している。EAC 地域では異常な降雨の増加とともに、雷によ理引き起こされた被害が増加している。

世界気象機関(World Meteorological Organization: WMO)によると、ウガンダは世界で最も落雷による死亡者が高率である国のひとつとされている。首都のカンパラ(Kampala)では他の都市に比べ年間の雷の発生日が増加している。2011 年 6 月には、雷が小学校に落ち、児童および教師 20 名が犠牲となり、100 名以上が負傷した。その小学校には避雷針がついていなかった。2011 年の 6 月末には少なくとも 31 名が散發性の雷による感電により死亡した。

ケニアのリフトバレー州では 2011 年の 7 月に草葺屋根の家屋に雷が落ち、一家のうち 8 名が犠牲となった。2012 年の 6 月末には 3 名が落雷により路上で死亡、同年 7 月初旬には裸足で歩いていた男性 1 名と女性 2 名が落雷により死亡し、数名の負傷者が出ている。タンザニアでは 2012 年の 6 月初旬、家屋に雷が落ち、一家の 6 人が死亡した。このとき暴風を伴った豪雨は夜に降り始め、6 名が避難した草葺屋根に雷に落ちたということが確認されている。

ルワンダでは2011年9月末、激しい降雨があり、洪水が起こった。12戸が倒壊し、27戸が浸水した。同時に激しい雷雨も発生し、落雷により学生と教師各1名が死亡、16名の重傷者を出した。ブルンジでは2011年の2月中旬、落雷により、学生12名および教師1名が死亡し、多数の重症者も出した。2010年10月にはミサ中の教会で牧師1名と教会関係者3名が犠牲となり、数日後には他の落雷が原因で3名が死亡した。また別の落雷が原因で最低でも家屋が37戸倒壊した。

このように落雷による被害が加盟国において増加している。

(5) 伝染病

-マラリア

2011年世界マラリア報告書(the World malaria report 2011)によると、21,600万件報告されており(感染は未確認であるものの感染の疑いがある例は14,900万件から27,400万件)、2010年には655,000名が命を落としたと言われている(537,000名から907,000名は未確認ではあるもののマラリアで命を落とした可能性がある)。2000年と比較して、マラリアによる死亡率は世界で25%、WHO アフリカ地域で33%減少している。アフリカでは子供がマラリアにより死亡するケースが多くあり、1分に子供1名が命を落としている*³⁴。

EAC加盟国ではマラリアは伝染病の中で最も恐ろしい病気の一つとされている。2011年世界マラリア報告書によると、加盟国の多くの地域でマラリアに対する危険度が高い。ケニアではマラリア感染の危険性がない地域で暮らす人々の割合は約4割にとどまっている。

2000年から2010年の間にマラリアによる入院患者数はルワンダとタンザニア(ザンジバル)では半分以下になったが、ケニアではその減少率は低い。ウガンダとタンザニア本州ではマラリアによる入院患者数は増加している。

ブルンジでは1993年に800,000例であったのが、2000年には3,000,000例と大幅に増加している。マラリアの治療費や蚊帳代は家計にとって大きな負担となっている。

-HIV・エイズ

サハラ以南の地域では世界中のどこよりもHIV・エイズの感染率が高い。この地域では2,290万人がエイズに感染していると言われており、その患者数は世界のHIV・エイズ患者数の3分の2を占めている。サハラ以南の地域では2010年には、約120万人がエイズにより死亡し、190万人が新たにHIVに感染した。同地域では累計1,480万人がHIV・エイズにより片親または両親を亡くしている。

エイズは健康分野のみではなく、教育、工業、農業、輸送、人材など、社会や経済への大きな影響も持っている。サハラ以南の地域でのエイズの伝染はその地域の開発段階を何十年も前の状態に戻してしまうほど影響が大きい*³⁵。

成人のHIV感染率はブルンジ、ケニア、タンザニア、ウガンダでは5%を超えており、ルワンダでも3%という高い割合となっている。

-コレラ

コレラは近年アフリカで猛威を振るっている。過去20年における全世界でのコレラ発生の95%はアフリカで起こっており、コレラにより何百万人もが犠牲になっている。しかし最近では菌の毒性は弱まってきており、特に非常に効果的な経口補水療法が確立されてから死亡率は急激に低下している。こうした状況の中でもEAC加盟国でコレラが発生すること

があるのも事実である。

ルワンダでは2007年にコレラが3地域において流行し、918の感染例が報告された。そのうち17名が死亡し、致死率は1.85%であった。2011年8月にはブルンジ西部でコレラが流行し、600名以上が感染し、12名が死亡した。

タンザニアでは広い地域でコレラが発生している。コレラが最初に大流行したのは1992年であり、18,526名が感染、うち2,173名が死亡した(致死率11.7%)。1997年1月末にダルエスサラームで流行し始めたコレラでは40,249名が感染し2,231名が命を落とした(致死率5.54%)。

ケニアでは1971年以来何度かコレラの流行が起こっている。1974年から1989年の間には毎年の致死率が3.57%であったという報告がある。最も大きな流行は1997年に発生し、1999年まで続いた。報告されたケースだけでも33,400例に上り、その数はその3年間にアフリカ全土で発生したコレラ患者数の実に10%を占める。

国際赤十字新月社連盟によると、ウガンダでの最初のコレラ症例は1979年に確認された。国内史上最悪のコレラが流行した1998年にはほぼすべての地域で症例が確認され、感染者数は30,000名以上であった。最近では2012年7月にコンゴ民主共和国からウガンダ西部にかけて発生した。同年9月6日の時点で2名が死亡し、14名が入院した。

-エボラ

最初のエボラの流行は1976年に出血性の病気としてザイールで318例が確認され、そのうち280名が死亡した。死亡した患者は発症からあまり時を経ずに死に至った。同年スーダンにおいても発生し、1,976,284名が感染し、そのうち156名が死亡した。

エボラとマールブルクを引き起こすウィルスはサルと人両方に感染するという点でよく似ている。これらのウィルスは宿主を短時間で殺し、次の宿主へと移動する。

ザイールで発生するエボラウィルスの致死率は88%と、スーダンで発生するエボラおよびマールブルクウィルスの致死率よりも高い*³⁶。

最近のEAC加盟国でのエボラの流行はウガンダのキバーレ(Kibaale)地方で2012年の9月3日に発生している。同年9月3日時点で感染の疑いを含めて24例報告されており、そのうち17名が死亡した。

2.1.2 その他の災害

(1) 地震

大地構帯の存在が周辺の高地において地震を引き起こす原因となっている。EAC加盟国の中ではウガンダが最も地震の被害を受けやすい国である。ウガンダ国内では西部および中部が地震に対して脆弱性である。1994年にマグニチュード6.2の大きな地震がルエンゾリ(Rwenzori)地方で起こり、50,000人以上が被災している。

ルワンダでは西部が地震にとされている。2008年にルワンダ西部のルシジ(Rusizi)およびニャマセキ(Nyamashoke)でマグニチュード5.9の地震が発生し、39名が死亡、600人以上が負傷し、2,000名以上が家を失った。

ブルンジは大地構帯の西部に位置しており、大地構帯や震源の影響が特にブジュンブラ(Bujumbura)地方において明確にみられる。1960年9月22日に発生した地震は度重なる余震の後に発生し、震源がブジュンブラに近かったことから深刻な被害を受けた。

タンザニアでは大地構帯が国を横切っており、東リフト・バレーと西リフト・バレーを作り上げている。

ケニアでは深刻な被害をもたらす地震は最近発生していないが、大地構帯の中に存在しているため、地震による被害の可能性はある。

(2) 火山活動

大地溝帯に沿って火山活動も見られる。ケニアには複数火山が存在しているが、大半は活動的では無い。最も近年の噴火は 1921 年にバリアー山(Mt. Barrier)で起こった。

タンザニアでは 2010 年タンザニアで最も活発な火山の一つであり、噴火を繰り返しているオールドイニョ・レンガイ(Ol Doinyo Lengai)が噴火した。火山活動が活発になったきっかけとして、ケニアおよびタンザニアで 2007 年 7 月 12 日から毎日発生した地震があげられる。この地震では最も大きなものではリッチャー(Richter)地方でマグニチュード 6.0 を記録し、直近のものは 2007 年 7 月 18 日の現地時間午後 8:30 にナイロビ市において発生した。

ルワンダ西部には活火山および死火山が連なって存在している。2002 年にはコンゴ民主共和国東部のニーラゴンゴ(Nyirangongo)山が噴火し、コンゴの都市ゴマ(Goma)と接しているリヴァイブ(Rubavu)に 400,000 人にもものぼるコンゴ民が避難してきた。コンゴでの火山噴火はルワンダのみならずウガンダやブルンジにおいてもハザードとなっている。

(3) 津波

津波は大洋底に沿った地震によって引き起こされるため、津波と地震は密接に関連している。2004 年 12 月 26 日のインド洋で過去 100 年で 3 番目に大きい地震(マグニチュード 9.2)に起因して発生した津波は過去最大のものであった。この地震の震源はバンダ・アチェ(Banda Aceh)で、インドネシアのスマトラ島北端に位置する州の州都である。

多くの東アフリカ諸国でもその津波により多くの被害を出した。甚大な被害をもたらすに至った要因は以下のとおりである：

1. 震源から 6000km 未満という距離
2. インド洋中央部の浅瀬 (Saya de Malha and Cargados Carajos Shoals、セーシェル) の影響による津波のエネルギー散逸
3. ケニアおよびタンザニアでは干潮時に初波かつ最も大きな津波が押し寄せた。このことにより 1-1.5m 波が高くなり、その状態が 5 分から 10 分続いた。この津波により潮間帯を歩いていたり泳いでいたりした人が波にのまれ、タンザニアで 11 名、ケニアで 1 名が亡くなった^{*37}。

(4) 害虫・害獣

害虫・害獣が家畜を襲う他、作付け中および収穫後の作物を荒らす被害が出ている。自然環境の変化、気温、単一栽培、新しい害虫の出現、抵抗力の弱さ、害虫駆除の失敗、悪天候や転住により害虫の数は増加している。害虫は植物、作物に影響を与え、結果として食糧不足や食糧飢饉、経済への悪影響をもたらす。ウガンダではキャッサバモザイク病ウィルスが 1997 年に流行し、深刻な被害をもたらした。

ケニアではコーヒーに付着する害虫が増加しておりその害虫駆除や管理のための費用はコーヒーの生産コストに打撃を与えている。コーヒー生産の際に問題となる種類として、節足動物(害虫)、微生物(病気)や雑草などがある。Oeke (1995) によるとコーヒーを含

む 8 種類（計 5800 億米ドル相当）の生産物のうち 42%（2400 億米ドル）が被害を受けたと報告されており、その内訳は害虫（15%）、病原体（13%）、雑草（13%）となっている。1998 年には全世界で害虫や病気から作物を守るために 340 億米ドルものコストがかかった (Yudelmon et al., 1998)^{*34}。

ウガンダでは「Sustainable Vermin Control: Hoima and Masindi Districts of Uganda」というプロジェクトがウガンダ保護基金(Uganda Conservation Foundation)によって実施された。そのプロジェクトによると、ヒヒ類、猪やその他の野生動物による作物荒らしが地方コミュニティや保護地域において一番大きな問題となっている。この被害は人口密度が高いところや人口が増加しているところでも多く見られ、特にホイマ(Hoima)地方やマシンジ(Masindi)地方で深刻な被害が出ている。こうした地域の特徴として、生育している生物の種類が少なく、森の端や公園で作物を育てるような貧しい人々が多く存在するということがある。野生動物が田畑を荒らすと人々の自然を守ろうという心は薄れていく。そして森林保護に向けた地域からの協力が減少し、保護に対する努力を無駄にしてしまう。こうした土地の生産性は低下する。子供にも影響が及んでいる。日中野生動物から作物を守るため、学校にいけない子供も出てきている^{*35}。

(5) 紛争

戦争、社会情勢悪化、治安悪化はガバナンスの失敗による社会での緊張の高まり、希少資源をめぐる争い、自国・世界両方の政治形態や経済に関することから起こり得る。そうした緊張は社会、政治、イデオロギー、宗教、文化、ジェンダー、民族、国家のアイデンティティーに分極化し、緊張が高まると計画的に暴力を伴った争いに発展したり、内外での集会や暴動が起こることがある。争いの場合は環境破壊や深刻な食糧不安がある場所、人口過剰の場と関連していることが多い。

2007/2008 年にケニアでは選挙後暴動とも呼ばれる最悪の国内での争いが起こった。1,300 人以上が殺害され、およそ 600,000 人がその土地を離れた。土地を離れた人は、難民キャンプにたどり着いた人もいれば生まれ故郷に戻る人もいた。その暴動により、7%と見込まれていた経済成長は 2%以下にとどまった。

ウガンダでは 1979 年イディ・アミン政権を失脚に導いた争いが大きな争いとしてあげられる。1980-1986 にはウガンダ中央部で、1986-2007 には北部および東部で紛争が発生した。ほかの形態の争いではカラモジャ(Karamoja)地方での畜牛盗難が例としてあげられる。タンザニア（特にモロゴロ (Morogoro) 地域やマヤラ(Manyara)地域）では農業従事者と酪農家の間で争いが起こることがある。

(6) 家畜の伝染性疾病（リフトバレー熱、東海岸熱など）

リフトバレー熱はウィルス性動物原性感染症であり、動物に害をもたらすが、時には人間が感染することもある。感染すると動物、人間ともに感染者は深刻な症状を引き起こすことがある。また、病気は、家畜の死亡・家畜の流産など、経済的損失に結びついている^{*38}。

東海岸熱はアフリカにおいては最も注意すべき家畜の伝染性疾病と言えるかもしれない。1992 年時点ではこの病気がもとで年間 110 万頭の畜牛が死亡し、それにより 1 億 6,800 万ドルの損失が出ている。この伝染病はスーダン、南アフリカ、コンゴ民主共和国、スワジランド、ジンバブエ、ザンビア、タンザニア、ケニア、ウガンダで確認されている^{*39}。

牛疫は非常に伝染しやすく、致死率が高い病気であり、牛や反芻動物へ感染することが多い。

小反芻獣疫(PPR)は牛疫に似た病気で羊やヤギに感染し、致死率が高い。現在警戒すべきスピードで広がりを見せている。

牛肺疫(CBPP)はひどく衰弱、または死に至らしめる病気であり、牛や大きな反芻動物に感染する。急性もしくは慢性の呼吸器疾患を引き起こす。

他の病気としては狂犬病、炭疽病、気腫疽、トリパノゾーマ病などがある。

タンザニアで多くの家畜にとって脅威となる伝染病としては牛疫、脚や口の炭疽病、急性序幕肺炎(CBPP)などがある。

(7) 環境破壊

土地利用の失敗、廃棄物や自然界のサイクルを乱すような習慣により起こる現象である。環境破壊は過剰耕作、傾斜地での無計画な耕起習慣、単作、無計画な肥料や農薬の使用、焼畑、過剰漁、森林破壊などにより起こる。

ウガンダでは乾燥、過剰耕作、レンガ造り、酪農、人間の移住、工業開発プロジェクトなどにより湿地の破壊が起こっている。生育地の破壊や動物相・植物相の減少による蚕食も起こっている。ビクトリア湖の水深深くではナイルパーチという魚の出現により植物プランクトンが減少し、貧酸素化している。この例は外来種を入れ込む際はその前にそれによって生態系にどのような影響を与えるかについての詳細な調査が必要であることを示した。ウガンダにおいても人間が持ち込んだ外来種であるホテイアオイが原因で漁業に悪影響をもたらしている。

(8) 火災

不測で大規模な火災は機器、住居、所有物の消失や人間への被害の原因となる。火災の原因としては不注意による電線の不具合、不十分な建築基準、事故、放火、無計画な焼畑または投棄物からの出火などである。火災が発生しやすい場所としては工場、家屋密集地帯、研究機関や人の多く集まるマーケットなどである。石油やガスを利用するとそれらはとても燃えやすいので、火災のリスクが高くなる。火災予防や管理のために火災というハザードに対して敏感になること、火災に対する知識の啓蒙活動を促進することが必要である。

ケニアでは火災は特に工場、森林、しっかりとした構造を持っていない家屋、多くの人々が集まる場所、自然の中に一時的に建てられた建物などにおいて大きなハザードリスクとなっている。

ブルンジの地方都市であるゴジ(Ngozi)およびギテガ(Gitega)が火災で全焼した。その火事では一台も火事から逃れた車はなく、全ての車両が焼失した。この事例は火災が都市において大きなハザードとなっていることを示す例となるであろう。ブシュンブラ市では電気を起因とする都市火災が増加している。

ルワンダでは火災の発生件数は少ないが、火災による大きな被害が出ることもある。2009年に発生した森林を含む火災では国立火山公園にあるムハブラ(Muhabura)山山頂まで火の手がまわり、150ヘクタールが焼失した。最近ではヤガタラ(Nyagatare)地方で起こった火災で森林と農場計30ヘクタールが焼失した。

タンザニアでは漏電による都市火災が多く報告されている。特に高台に住む人々は火災発生時の避難経路が限られており、危険な状態となっている。

(9) 外来種

外来種は新しい環境に適応・増殖し、もともとのエコシステム、人間の健康や福祉に悪影響を与える種と定義されるであろう。外来種は彼らのもともとの生息地で何かしらの不都合があり、それにより新しい地へと移住するものとされている。外来種は次にあげるほぼ全ての分類学に存在している：

- ・ バクテリアやプランクトンなどの微生物
- ・ 木、灌木、ツル科の植物
- ・ 動物（昆虫、爬虫類、両生類、哺乳類）

ウガンダでは外来種による経済損失は、数十億ウガンダ・シリングにおよぶと推定されている^{*48}。

ケニアでは外来生物の侵入により社会経済に大きな打撃が出ている(Keil, 1988)。フナクイムシ (Hodges et al., 1983; Muhihu and Kibata, 1985)、ホテアオイ(Hill, Cock and Howard, 1999)、プロソピス属の生物が例として^{*49}。

多くの外来種はタンザニアで発生している。その多くは河川沿いや人間の住む近く、装飾植物が庭にある村落や街で発生している。公の保護地においても外来種は発生している。例としてセレンゲーテ(Serengeti)国立公園、ンゴロンゴロ(Ngorongoro)保護地域、セルオスゲームパーク(Selous Game Reserve)（世界遺産）があげられる。これらの地域で発生している外来種にはネムリグサ、ランタナ、ヒラウチワサボテン・オープンチア属、マツ属、ガム属、海藻^{*38}などがある。

(10) 気候難民

気候難民と呼ばれる新しい現象が出てきた。気候難民とは気候による環境災害によって移住を余儀されなくされた人のことを指す言葉である。干ばつ、砂漠化、海面上昇等の増加や、ハリケーン、サイクロン、火災、洪水、竜巻等の異常気象の頻度がますます増加しており、これらは急激な生態系の変化に起因するものと考えられる。

以上の他、その他の災害として次のようなものがある：

- ・ アレルゲン
- ・ 領き病
- ・ テロリズム
- ・ 強風
- ・ 陸路、海路、輸送時での事故
- ・ 採鉱
- ・ 工場
- ・ 社会紛争
- ・ 畜牛の盗難

2.2 EAC 加盟国における災害の統計的分析

EM-DAT に報告されている EAC 加盟国の災害記録によれば、報告されている EAC 加盟国での災害は、干ばつ、洪水、風害、地すべり、伝染病、地震、害虫、紛争、事故、火事で

ある^{*1}。図 4 は 1980 から 2010 における EAC 加盟国での災害発生状況を、図 5 は同期間での被災者数を示している。洪水と伝染病の発生回数は 100 回を超えており、干ばつの発生回数は洪水と伝染病の三分の一程度であるが、干ばつの被災者数は他の災害と比較して非常に多い。

図 6 は 2006 年から 2011 年の間の災害および被災者の変移を示している。ケニアでは洪水が一年に複数回起こっている。1961-62 年および 1997-98 年の洪水はケニア国内において最悪の被害をもたらした^{*16}。

ケニアでは洪水は一年に複数回発生しており、1961-1962 および 1997-1998 はケニアにおいて最悪の洪水が発生した年であった^{*16}。1997-98 年の洪水における被災者数は 900,000 人、経済損失は US\$11,800,000 であった。ルワンダにおいては過去 10 年で洪水の発生回数が増加している^{*27}。

EAC 加盟国各国における災害の発生状況および被災者数は図 7 から図 11 に示されている。ケニア、タンザニア、ウガンダにおける洪水による被災者が多いのに対し、ルワンダとブルンジにおいては他国に比べて少ない。

干ばつの発生回数はおよそ三年に一度である。しかしながら、複数の国で同時に起こっており、その被災者数は莫大である。災害は国境を越える問題であることが言える。そのため、EAC 加盟国においても災害に関する情報を共有することが大切である。

ルワンダは他の加盟国と比べて被災者の数は少ないが、加盟国の中で最も人口密度が高い国であるため、人口圧力が増加している。そのため、ルワンダにおいては土地利用に関する政策が災害リスクマネジメント分野においては非常に重要な分野である。ルワンダのみでなく、全ての加盟国においても土地利用計画は都市開発や都市部への人口流入に対応するための重要なツールである。

EM-DAT に報告された EAC 地域における災害の記録は、本レポートの添付資料である「戦略(案)」の添付資料 2 に記載している。

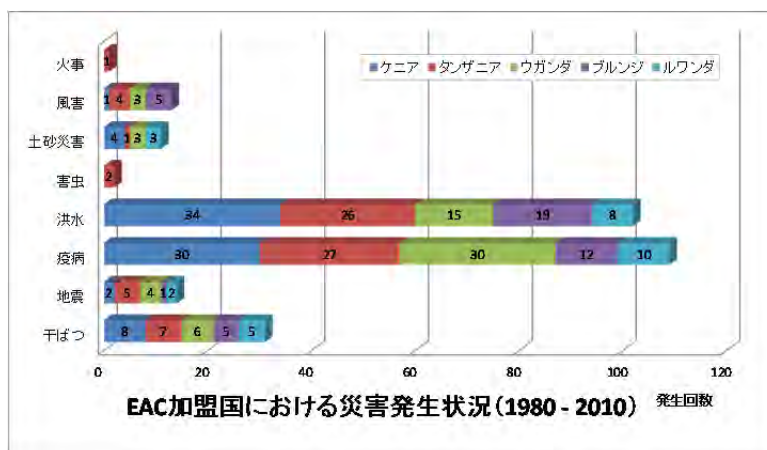


図 4 EAC 加盟国での災害発生状況(1980 - 2010)

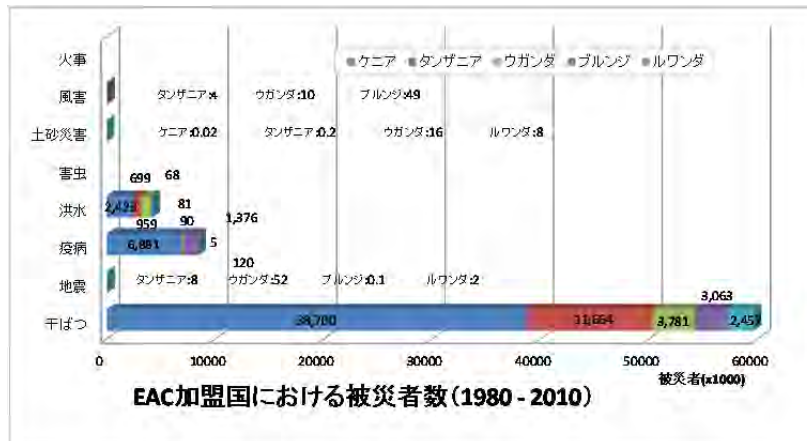


図 5 EAC 加盟国での被災者数(1980 - 2010)

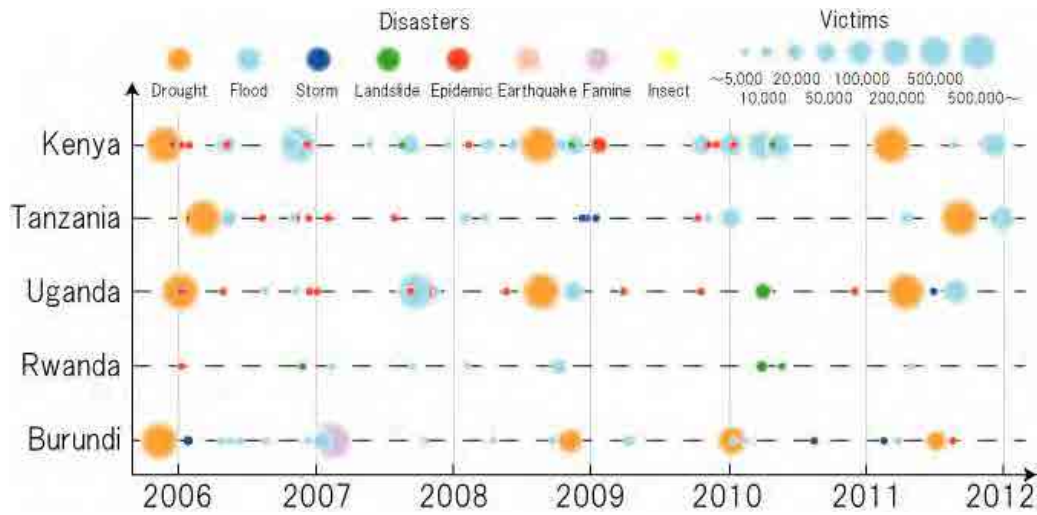
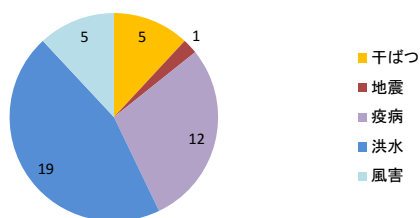


図 6 災害発生と被災者数の変移(2006 - 2011)

ブルンジにおける災害発生状況
(1980 - 2010)



ブルンジにおける被災者数
(1980 - 2010)

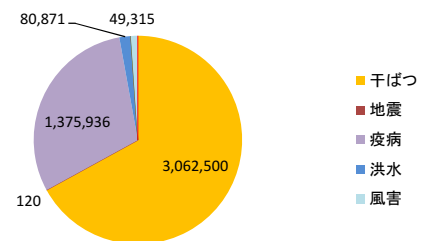
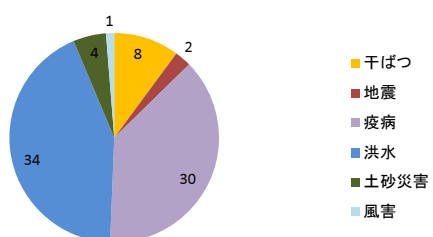


図 7 ブルンジにおける災害発生状況及びその被災者数(1980 - 2010)

ケニアにおける災害発生状況
(1980 - 2010)



ケニアにおける被災者数
(1980 - 2010)

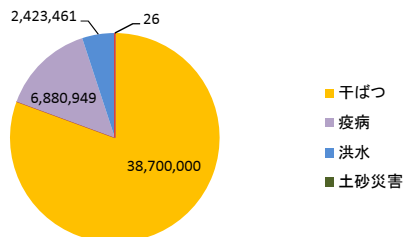
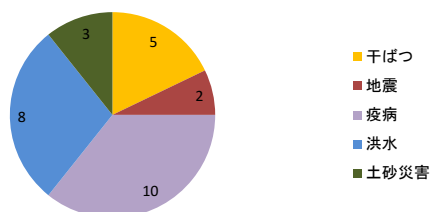


図 8 ケニアにおける災害発生状況及びその被災者数(1980 - 2010)

ルワンダにおける災害発生状況
(1980 - 2010)



ルワンダにおける被災者数
(1980 - 2010)

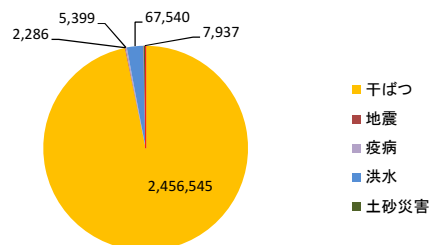
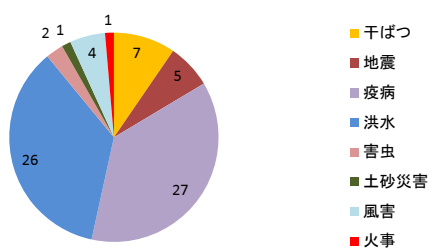


図 9 ルワンダにおける災害発生状況及びその被災者数(1980 - 2010)

タンザニアにおける災害発生状況
(1980 - 2010)



タンザニアにおける被災者数
(1980 - 2010)

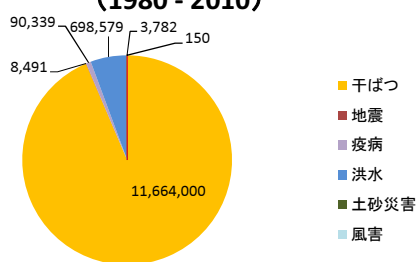
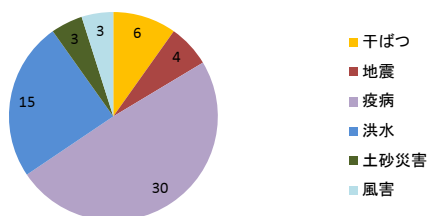


図 10 タンザニアにおける災害発生状況及びその被災者数(1980 - 2010)

ウガンダにおける災害発生状況
(1980 - 2010)



ウガンダにおける被災者数
(1980 - 2010)

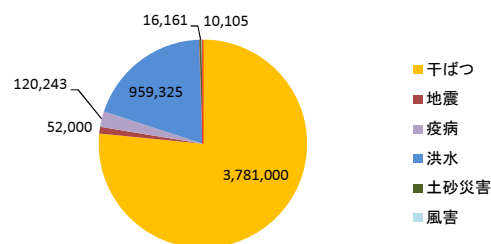


図 11 ウガンダにおける災害発生状況及びその被災者数(1980 - 2010)

2.3 EAC 加盟国における兵庫行動枠組優先分野に関する状況

災害リスクマネジメントに関しての種々のメカニズムが EAC 加盟国に存在する。それらのメカニズムを HFA の 5 つの優先課題 (ガバナンス・政策、リスクの特定・早期警報、知識・技術革新・教育の利用、潜在的なリスクファクターの削減、効果的な災害対応のための備えの強化) に基づき分析する。

2.3.1 ガバナンスおよび政策

EAC の加盟国では、災害リスクマネジメントを実施するための政策、法制度、制度的枠組み、国家プラットフォームを創設している。

(1) 政策および法制度

表 5 は EAC 地域の国家災害リスクマネジメント(Disaster Risk Reduction: DRR)の政策をまとめたものである。全ての EAC 地域において、DRR 政策は持っているものの、それが閣議で承認されていない国もある。

表 5 以外の国家災害リスクマネジメントや戦略については戦略 (案) 添付資料 3 に添付する。また、加盟国の新災害リスクマネジメント政策に基づいた災害リスクマネジメント関連機関は戦略 (案) 添付資料 4 に記載している。

表 5 各国の防災に関する国家政策

国名	DRR 政策	考案・承認年	内容・現状
ブルンジ	リスク及び防災管理に関する国家政策 (National Policy for Risk Prevention and Disaster Management)	政策は 2008 年に内閣により承認されたが、国会では承認されていない	<ul style="list-style-type: none"> 左の政策とともに防災および災害管理に関する国家戦略及び国家アクションプラン 2012-2015^{*14} (National Strategy for Risk Prevention and Disaster Management and National Action Plan 2012-2015)が存在する。

国名	DRR 政策	考案・承認年	内容・現状
ケニア	ケニア国家災害管理政策(National Disaster Management Policy of Kenya :NDMP) ^{*15}	2011年2月に最新版が考案された	<ul style="list-style-type: none"> 提案されたものの、2012年の時点では承認されていない この政策は現存する法令の統合、分野別の委任、政策、戦略、不測事態対応計画、防災管理に関する枠組みを定めている。
ルワンダ	国家防災政策(National Disaster Management Policy) ^{*27}	2009年に承認された	<ul style="list-style-type: none"> 改訂版が存在し(2012年6月時点)、承認を受けるために内閣に提出された。
タンザニア	タンザニア本土国家災害管理政策(National Disaster Management Policy) ^{*29,*30} ザンジバル災害管理政策(Disaster Management Policy in Zanzibar)	2004年に承認(現在改訂中) ザンジバルの政策は2011年に改訂された。	<ul style="list-style-type: none"> 左の政策及び国家災害管理運用ガイドライン(This policy and National Operational Guidelines for Disaster Management 2003)は全ての行政レベルにおいての防災に関する枠組みを統制している。 新政策が2012年の時点で提案されている。
ウガンダ	国家防災管理政策(National Policy for Disaster Preparedness and Management) ^{*32}	2010年に考案され、2011年5月に承認された ^{*33}	<ul style="list-style-type: none"> この政策は首相府防災軽減・難民局に国家災害管理予算を組み立て、提案することについて言及している。

加盟国の法制度はタンザニア(Disaster Relief Coordination Act no. 9 of 1990)を除いて制定の過程にある。

(2) 制度的枠組み

現在、全てのEAC加盟国において災害リスクマネジメント関連の制度的枠組みを持っている。ブルンジ、ケニア、ルワンダ、タンザニアでは、災害リスクマネジメントに関する枠組みは提案されている状況であり、ウガンダでは新しく承認されている。これらの提案・承認された行政組織について以下に述べる。

ケニアおよびルワンダでは災害リスクマネジメントを担当する省が存在する(ケニア:大統領府特別プログラム省(Ministry of State for Special programmes in Office of the President)、ルワンダ:防災・難民省(Ministry of Disaster Management and Refugee Affairs : MIDIMAR)。ウガンダでは内閣府防災難民救済局(the Directorate For Relief, Disaster Preparedness And Refugees In Prime minister's office)が、タンザニア本土では内閣府災害リスクマネジメント局(Disaster Management Department in the Prime Minister's Office)が、ザンジバルでは第二副大統領局(the Second Vice President's Office)が災害リスクマネジメントに関する責任機関である。ブルンジでは公安省市民擁護管理局(The directorate of civil protection in Ministry of Public Security)が災害リスクマネジメントに関する責任機関である。

全てのEAC加盟国において、地方レベルの災害委員会が存在する。ケニアでは国、県、郡、地域レベルにおいて、タンザニアでは国、郡、区、村落レベルにおいて災害委員会が存在する^{*30}。ザンジバルでは Shehia レベルで災害委員会が存在する。加えて、非政府組織

(Non-Governmental Organizations :NGOs)もオブザーバーとして委員会に参加している。ウガンダでは国家災害管理委員会、区災害管理委員会、準地域・区・村災害管理委員会が存在している。ルワンダでは、国家災害管理実行委員会、地方災害管理委員会(District Disaster Management Committees: DDMC)およびセクター災害管理委員会が設けられている。これらの委員会は災害に関しての情報を防災・難民省に迅速に伝える役目を担っている。

また、ルワンダでは、国連と防災・難民省の共同調整機関として、MIDIMAR/the United Nations (UN) Joint Intervention Management Committee (JIMC)が提案されている。JIMCはMIDIMARが議長になっており、JIMCはNDMECに助言を与える役割を担っている。加えてルワンダでは災害技術委員会(National Disaster Steering Committee)が防災・難民省、地方政府省(Ministry of local government: MINALOC)、自然資源省(Ministry of Natural Resources: MINIRENA)、インフラ省(Ministry of infrastructures: MININFRA)、国防省(Ministry of internal security :MININTER)、農業省(Ministry of agriculture: MINAGRI)、防衛省(Ministry of defense : MINADEF)などの関係省庁から成っている。ブルンジでは国家委員会、地方、コミュニティ委員会が災害リスクマネジメントにおいて存在している。

EAC加盟国各国の災害リスクマネジメントに関する行政組織図については戦略(案) **添付資料5**に添付する。

(3) 災害リスクマネジメント国家プラットフォーム

国家プラットフォームは全てのEAC加盟国で既存する。**表6**は国家プラットフォーム名、事務局および参加者を示している。

表 6 EAC 加盟国における国家プラットフォームと事務局

国名	国家プラットフォーム
ブルンジ	<p>国家災害リスクマネジメントプラットフォーム (The National Platform for Risk Prevention and Management Disaster (La Plate Forme Nationale de Prévention des Risques et de Gestion des Catastrophes)) *14 事務局: 公安省 (Ministry of Public Security (General Directorate of Civil Protection))</p> <ul style="list-style-type: none"> -防災技術担当省 -公共部門 -国際・国内 NGO -国連機関
ケニア	<p>国家災害リスクマネジメントプラットフォーム (National Platform for Disaster Risk Reduction (NPDRR)) *19 事務局: 大統領府特別プログラム省 (Ministry of State for Special Programmes; Office of the President)</p> <ul style="list-style-type: none"> -関係省庁 -NGO -メディア -国連機関 -教育機関 -他のステークホルダー
ルワンダ	<p>国家災害リスクマネジメントプラットフォーム (National Platform for Disaster Risk Reduction (NPDRR)) *27 事務局: 防災・難民省</p> <ul style="list-style-type: none"> -防災技術担当省 -国際ドナー -国際機関 -赤十字関連機関 -民間セクター -準国家 Sub-national DM Institutions -国連機関 -国際・国内 NGO -市民組織 -メディア -地方政府省 (Ministry of Local Government :MINALOC)を通じた現地機関
タンザニア	<p>国家災害リスクマネジメントプラットフォーム (National Platform for Disaster Risk Reduction) *4 事務局: 内閣府、災害管理局 (Office of Prime Minister, Disaster Management Department)</p> <ul style="list-style-type: none"> -中央、地方政府 -国連機関 -国際、国家開発機関 -宗教グループ -政府、民間機関 -メディア -NGO、CBO <p>ザンジバル準プラットフォーム (Sub-National Platform for Zanzibar) 事務局: 第二大統領局 (防災部)</p> <ul style="list-style-type: none"> -関係省庁 -UN 機関 地方政府 NGO、CBO
ウガンダ	<p>国家災害災害リスクマネジメントプラットフォーム (Inter-Agency Technical Committee)*32 事務局: 内閣府、防災救済難民局 (Office of the Prime Minister (Directorate Of Relief, Disaster Preparedness and Refugees))</p> <ul style="list-style-type: none"> -全関係省庁 -NGO -メディア -国連機関 -関連ステークホルダー

2.3.2 リスクの特定および早期警報

災害リスクを軽減するとともに災害レジリエンスの文化を推進するための第一歩は、ハザードの認識、および多くの国々が直面している災害についての物質的、社会的、経済的、環境的な脆弱性の認識、そして、その認識に基づいて取る行動によって短期的・長期的にハザードおよび脆弱性が変化することを認識することである。

(1) リスクアセスメントおよびリスクの特定

リスクアセスメントとは状況や認識されている脅威（ハザード）についてのリスクを定量的・質的に分析することである。

ケニアでは、ハザードデータおよび脆弱性に関する情報に基づいた主要分野における国家および地方のリスクアセスメントが存在する^{*4}。リスクアセスメントは異なる分野や組織に分散しているので、関係機関は互いに情報を共有していくことが大切である。現在、政府はUNDPからの援助およびケンヤッタ大学(Kenyatta university)からの助言を受けて、ケニアの国家リスクアセスメント及び脆弱性マップを作成している^{*4}。

タンザニアでは、首相府(Prime Minister Office:PMO)の災害管理局(DMD)が2008年に国家災害脆弱性調査(National Disaster Vulnerability Assessment in 2008)を行った。この調査は人災害、気候変動による災害、地質的状况による災害や環境による災害など、いくつものレベルにまたがる災害管理組織によって行われた。更にDMDは、農業省(Ministry of Agriculture)の国家食糧安全保障チーム(National Food Security Team)とともに早期食糧不足危険度調査(Rapid Vulnerability Assessment: RVA)を行った。これらの調査は国家または援助機関の援助により行われた。UNDPのDMDも時を同じくして15の地域においてリスクアセスメントに係る脆弱性および能力についての調査を行った。タンザニアがリスクアセスメントにおいて直面している問題には以下のようなものがある。

- 災害の発生やその被害を把握し、それを中央で集計するためのシステムの欠如しており、わずかにタンザニア統計局(National Bureau of statistics Tanzania)が定期的に被害を集計しているのみである
- 財政的資源が不十分であるため、リスクアセスメントの結果が計画等に十分活用されていない^{*4}
- 災害影響や脆弱性の全範囲にわたり評価する能力、特に二次的影響、比較経済分析および非金銭的コスト評価に関わる能力の不足^{*4}

ルワンダでは、2011年に2011-2012政府アクションプランにおいて洪水および地すべりの高リスク地域の解明に関する調査が行われた^{*21}。洪水や地すべりに関する災害リスクアセスメントはブレラ(Burera)、マセンゼ(Masanze)、ニャビフ(Nyabihu)の三地域で実施された。

ウガンダでは、リスクアセスメントはセクター別に行われている。農業省(Ministry of agriculture)では食糧保障や農業に関するリスクアセスメントが行われており、水環境省(Ministry of Water and Environment)では干ばつおよび洪水分野、環境管理局および地すべり局(Department of lands)では地すべり分野、エネルギー資源開発省(Ministry of energy and Mineral Development)では地震波、厚生省(Ministry of Health Disease and Epidemics)は病気と伝染病など、それぞれの分野における報告書を国家防災プラットフォームに行動案を添付して報告している。国家食糧アセスメントなどに関する機関内部においてのアセスメントも実施された。

ブルンジでは複数のハザードにまたがるハザードリスクアセスメントを実施し、国内の

10%の学校および病院がアセスメントの対象となった。一方で負傷者に対するアセスメントに関する国家基準はまだ確立されていない。

(2) ハザードマップ

ハザードマップとは特定のハザードの被害を受けた、もしくは、特定のハザードに対しての脆弱性を示した地図である。地震、火山、地すべり、洪水、津波などの自然災害において作成されることが多い。ハザードマップは被害を受けやすい場所を示すので、災害リスクマネジメントにおいて有効である。

ルワンダでは2012年5月までに政府アクションプラン2011-2012において、災害頻発地域における脆弱性マップやハザードマップの作成が防災・難民省によって行われた^{*1}。

タンザニアでは国家土地利用基本計画(National Land Use Framework Plan 2008-2028)ではハザード、リスクマッピングを計画している。ザンジバルについては、災害リスクと必要とされる対処能力のアセスメント(Disaster Risk and Capacity Needs Assessment)が2008年に実施され、災害のリスクマップと脆弱性マップが得られるようになっている。また、これまで参加型の必要性と対処能力についてのアセスメントが85の区で実施され、2010年10月時点では他の50区でアセスメントを実施中である^{*4}。

ウガンダでは湿地、環境、森林、地震、地すべり、干ばつ、洪水に関するハザードマップが存在するが、定期的な更新はしていない。地震ハザードマップは1994年、湿地ハザードマップは1997-2000年、環境ハザードマップは1999年、森林ハザードマップは1999-2001年、地すべりは2002年に作成され、現在マウント・イラゴン地方(Mount Elgon region)についてはそれらが更新されている。干ばつ・洪水ハザードマップは作成中である^{*31}。災害プロフィールおよびマップは3年ごとに更新される予定である^{*32}。

ケニアでは地質に関するハザードマップは存在するが、詳細なマップについてはケンヤッタ大学と通してUNDPの支援を受けている。

ブルンジでは干ばつ、洪水、地震についてのハザードマップが存在する。

ケニアについてはハザードマップについての情報が得られなかった。

上記のハザードマップについて、ウガンダ以外ではそれらのマップをインターネット上で検索することができない。容易にアクセスが可能なハザードマップの作成が必要である。ウガンダのマップは(<http://41.210.160.198:8081/>)からアクセスすることができる。

(3) 早期警報システム (Early Warning Systems: EWSs)

警報システムとは将来発生する可能性のある危機について知らせるために、個人もしくはグループによって作り出された生物学的、技術的なシステムのことである。警報を聞いた人がその警報に従い危険に備えたり、危険を軽減・回避したりすることを目的としている。

表7はEAC加盟国での早期警報システム(Early Warning Systems: EWSs)の整備状況を示している。

ブルンジでは農業畜産省(the Ministry of Agriculture and Livestock)が国連と協力して早期警報システムを提供しており、深刻な食糧問題を引き起こさないために、食糧保障に関しての月刊誌を発行している^{*13}。加えて、干ばつ、洪水、降雨、地すべり、伝染病、環境の分野についても早期警報システムが存在する^{*4}。

ケニアでは干ばつに関する早期警報システムが22の乾燥地域で干ばつ対応計画とリンクしていた他、28の乾燥地域でコミュニティレベルの干ばつ早期警報システムが存在する^{*3}。

ルワンダでは食糧保障、洪水、降雨、地すべり、伝染病、環境分野において EWS が実施されている。2010年7月に始まった国連開発計画(United Nations Development Programme: UNDP)および国連環境計画(United Nations Environment Programme: UNEP)主導の『Reducing Vulnerability to Climate Change by Establishing Early Warning and Disaster Preparedness Systems and Support for Integrated Watershed Management in Flood Prone Areas』と呼ばれるプロジェクトがあり、そのプロジェクトにおいても EWS を実施している^{*22}。

タンザニアでは様々なハザードを監視するための様々な EWS がある。政府のシステムにはタンザニア気象庁(Tanzania Meteorological Agency: TMA)、エネルギー資源省地震課(Seismology Unit in Ministry of Energy and Minerals)、保健福祉省緊急対応室(Ministry of Health and Social Welfare, Emergence Preparedness and Response Unit: EPRU)、農業・食糧安全保障省の植物保護課(Plant Protection Unit in Ministry of Agriculture)および食糧安全保障局(Food Security Department)などがある。非政府のシステムとしては食糧飢饉早期警戒ネットワーク(Famine Early Warning System Network: FEWS NET)がある。ザンジバルの災害管理局(Disaster Management Department: DMD)は UNDP による設備および人材開発の支援を受けて、国中に警報を発するにあたって、全てのセクターの中心となるべく、非常事態室の設置を計画している。また、ザンジバル災害管理局は、災害リスクマネジメント関連情報の総合的データベースの構築を構想中である^{*4}。

ウガンダの EWS に関する代表的な機関は防災難民省、気象庁、農業省、保健省、水省、土地省、環境省および地方省である^{*31}。現在、食糧保障、干ばつ、降雨、洪水、地すべり、伝染病、環境分野において EWS が存在する。

国際ドナーの支援を受けて EWS の整備を進めている国もある。国際ドナーの協力を受けて EWS を設立・運営する場合、国際ドナー側主導でプロジェクトが進められることが多いのでその中で被援助国が後に彼ら自身で設立・運営できる能力を身に付けることは難しい。そのため、EAC加盟国でこのようなプロジェクトを実施するには加盟国側が彼らの能力を高められるプロジェクトを実施することは有益である。

表 7 EAC 加盟国における既存の早期警報システム

	ブルンジ	ケニア	ルワンダ	タンザニア	ウガンダ
食糧保障	-水・環境・土地利用・都市計画省 -農業畜産省(農業畜産省はUNの支援により実施)	-農業省 -特別プログラム省 -食糧保障管理委員会 -気象庁 -DRSRS	-食糧飢饉早期警戒システムネットワーク (FEWSNET) -農業家畜省	-FEWSNET -早期警報室 -農業・食糧安全保障省	-FEWSNET/海外農業局(FAS) -農業・家畜・水産省 -食糧・農業関連機関

	ブルンジ	ケニア	ルワンダ	タンザニア	ウガンダ
干ばつ	-気象庁 -水・環境・土地利用・都市計画省	-北部ケニア・乾燥地域担当省 -特別プログラム省 -水資源省 -家畜省 -農業省 -気象庁	-農業家畜省	-タンザニア気象庁(TMA)	-技術協力・開発機関 (ACTED) -気象庁 -水・環境省 -農業・家畜・水産省
洪水	-水・環境・土地利用・都市計画省 -気象庁	-特別プログラム省 -水資源省 -気象庁	- 気 象 庁 (UNDP/UNEP の支援により実施) -ルワンダ環境管理局(REMA) -ルワンダ自然資源局(RNRA)(水資源部)	-TMA	-気象庁 -水・環境省
降雨	-水・環境・土地管理・都市計画省 -気象庁	-農業省 -食糧保障早期警報室 -気象庁	- 気 象 庁 (Rwanda Meteorological Center)	-TMA	-水省 -気象庁
地すべり	-水・環境・土地管理・都市計画省 -鉱山・地質局	-鉱山・地質局	-RNRA (土地部) -REMA	-エネルギー資源省 -地質調査	- 環 境 管 理 局 (National Environment Management Authority: NEMA) -建設・都市開発省 -水・環境省 -土地管理・都市計画省
伝染病	-国家環境・自然保護局(INECN) -保健省	-公衆衛生省	-ルワンダ生体医学センター (Rwanda Biomedical Center: RBC)	-保健福祉省 (緊急対応室) -国家環境管理委員会 (National Environment Council: NEMC) -家畜・畜産省	-保健省 -農業・家畜・水産省 -世界保健機関 (WHO)
環境	- INECN	- 環 境 管 理 局 (NEMA)	-REMA -RBC	-NEMC -副大統領室環境局	-NEMA

(4) 早期警報システムにおけるコミュニケーションおよび情報のフロー

災害リスクマネジメントにおいて災害時のコミュニケーションや情報のフローは大事な要素である。特に災害時の早期警報システムにおける迅速情報伝達は非常に大切である。

ブルンジでは国家災害リスクマネジメントプラットフォームに調整室を設ける予定がある^{*4}。

ケニアではその土地での言語を使用した EWS サービスもあるが、干ばつやインフラの整備不足により遠隔地ではこのサービスを利用できないことがある^{*4}。

早期警報システムにおいて、緊急時の迅速かつ協力された行動が重要である。ケニアの最遠隔地では、道路以外の情報伝達手段がないので、こうした状況が早期警報システムのネットワークを妨げている^{*4}。

タンザニアでは現在気象庁により、毎日天気予報が提供されている。ザンジバルでは県防災機関が防災情報をやり取りできるように 16 の防災無線が運用されている^{*4}。タンザニアにおいての EWS の問題点はステークホルダーや一般の人が防災について知ることができる確固たるデータベースやウェブサイトが欠如していることである。現在はステークホルダーやコミュニティに対しての情報は災害リスクマネジメントプラットフォーム、出版物、ラジオ、テレビなどを通して提供されている^{*4}。他の問題として予算、技術的ノウハウ、IT 機器など資源不足がある。年単位での防災に関しての政府レポート、データベース、インターネット等、他の手段を利用した情報共有が必要である。この取組は複数の災害リスクマネジメントに関しての情報を得ることの大切さについて一般の人に対しての教育と並行して行われるべきである^{*4}。

ルワンダではルワンダ気象センターを通じて毎日テレビやラジオ、天気予報を提供している。これに加えて防災・難民省では社会保障に関連するセクターに 400 以上の携帯電話を配布し、発生可能性のある災害や災害発生時の報告に使用されている。この取り組みでは災害・緊急コミュニケーションシステムと呼ばれるイニシアティブが世界食糧プログラム (World Food Programme: WFP) の支援のもとに携帯電話を利用した迅速かつ有効なコミュニケーションを目指している。

EWS 実施時の情報伝達手段は戦略 (案) **添付資料 6** に示されている。

2.3.3 知識、技術革新、教育

人々が災害についての情報を熟知し、そして災害軽減に向けて動き出せば災害は継続的に軽減させることができる。そのためにはハザードや脆弱性、キャパシティについての知識や情報を収集・整理し、広める必要がある。

表 8 は EAC 加盟国においてのコミュニティと学生に向けた防災分野の教育プログラムおよび啓蒙活動を示している。

ブルンジではユニセフ (United Nations Children's Fund: UNICEF) と教育省 (Ministry of Education) が防災に関する授業を取り入れることを検討している^{*2}。

ケニアでは行政により啓蒙活動が行われており、メディアも啓蒙活動に協力している。多くの国際 NGO や国内 NGO もコミュニティレベルの啓蒙活動に協力している^{*4}。洪水に関する教育の需要についても調査が行われた^{*3}。教育について、第三者機関によって修士コースが導入され、それよりも下のレベルの段階でも防災教育が行われている。

タンザニアでは政府関係者やメディアに対して次に挙げるような様々なワークショップや

プログラムが行われている。

- タンザニア災害対応能力強化プロジェクト(Strengthening Tanzania Disaster Response Project: STDRP)の実施および、災害リスクマネジメント研修センター(Disaster Management Training Centre: DMTC)の設立(United States Agency for International Development: USAID の財務援助による)*28
- 災害リスク軽減に係るメディアやシティープランナーに対するトレーニング(ザンジバル災害管理局)*4
- 災害リスク軽減・予防に係るマニュアルの作成および関係者への配布
- ザンジバルのコミュニティは各 Shehia で開かれる Shehia 災害管理委員会主催の会議を通じて災害リスク軽減政策の作成に携わっている。ザンジバル緊急予防・対応計画(Zanzibar Emergent Preparedness and Response Plan: ZEPRP)の作成についても同じ手法が取られている。彼らの役割や責任については政策や災害管理条例の中で述べられている*4。
- 災害管理局はパネリストや視聴者と電話でその年のテーマである「自分の街を回復力のある街にしよう、災害に対する準備をしよう」というスローガンについて議論をするラジオやテレビに出演している*4。
- 災害研修マニュアルの開発

高等教育について、タンザニアではドドマ大学(University of Dodoma)では防災についての学士号を、アーディ大学(Ardhi University)では防災の修士号を取得することができる*4。ケニアではマシндеムリロ(Masinde Muliro)大学、ケンヤッタ(kennyatta)大学、ジュモケンヤッタ農業技術(Jomo Kenyatta University of Agriculture and Technology)大学などの国内大学で学士課程および修士課程の防災コースが存在する。他の高等教育の例として、ペリペリ大学と呼ばれるネットワークが存在する。ペリペリ大学とは the Partners Enhancing Resilience to People Exposed to Risks : Partners (パートナー) Enhancing (発揚) Resilience (回復力) People (人々) Exposed to Risks (危機にさらされた) の頭文字を取ってつけられ、災害教育、研修、研究のための国をまたいだネットワークである。複数のアフリカ諸国が参加しており、EAC 加盟国ではケニア、タンザニア、ウガンダがこのネットワークに含まれている。

ザンジバル災害管理局は UNDP2011-2015 およびザンジバル成長・貧困削減戦略 2010-2015 を通じて防災の主流化についてのカリキュラムを初等および中等教育に組み込むことを検討している*4。タンザニアではこのように様々な活動が計画・実行されているが、これらの活動に際しての実行能力は十分ではない。そのため、タンザニアは EAC をはじめ、南部アフリカ開発共同体(South Africa Development Community: SADC)、アフリカ連合に加盟し、これらの機関からのサポートを受けている。

ルワンダでは中等教育において防災教育が行われており、啓蒙活動はメディア、ワークショップ、ミーティングを通して行われている。

ウガンダでは啓蒙活動は日常的に研修や教育、ワークショップ、行政機関を通して行われており、メディアも啓蒙活動に加わっている。

防災活動は第三者機関でも行われており、国家カリキュラム開発センターを通じてさらに下のレベルでの教育を行われる予定である。災害リスクマネジメント局は啓蒙活動および早期警報整備し、スタッフはハザードや災害リスクマネジメントに関しての技術的教育やコミュニティに対しての教育を行う役割を担っている。

表 8 EAC 加盟国におけるコミュニティおよび学生対象の教育プログラム・啓蒙活動

	教育プログラム	啓蒙活動
ブルンジ		啓蒙ワークショップと現地実習(UNDP および国家プラットフォームの協力により国民保護局が実施) ^{*2}
ケニア	防災教育 ^{*4} 防災に関しての学士および修士コース	5 県 (county) で津波に関するワークショップ ^{*3}
ルワンダ	防災啓蒙 (初等教育および中等教育) ^{*20} 衛生科の授業の中での生態学・環境科学の取扱い (多くの中等教育) ^{*20} 災害管理モジュールが開発され、中等教育に組み込まれている	メディア、ワークショップ、会議を通しての定期的な啓蒙キャンペーンの実施
タンザニア	防災教育 (学士レベル、ドドマ大学、修士レベル、アーディ大学) ^{*4}	様々なワークショップが実施されている。一例として、ザンジバル DMD による 2 日間のワークショップ (高等教育の生徒対象)。災害に関する情報や知識の交換を行った(2010 年 10 月) ^{*4} 。
ウガンダ	気候変動、環境破壊、干ばつ、洪水パターン等、ハザードに関する授業 (防災の面とはつながっていない) ^{*31} マケレレ(Makerere)大学において修士コースがある 環境破壊コントロール (地すべり、洪水、土壌劣化) ^{*31} 防災が第三者機関によって広められている。国家カリキュラムセンターによって低学年の生徒への防災教育が行われる予定である。	地すべり危険地帯 (マウントエルゴン地域 Mt. Elgon region) および洪水危険地帯 (テソ地域 Teso region) の住民に対するハザードリスク管理ワークショップ

2.3.4 潜在的なリスクファクターの削減

潜在的なリスクファクターの削減においては、社会・経済・環境・土地利用の変化に関する災害リスクと、地質、気候、水、気候変動に関するハザードの影響を、開発計画やプロジェクトはもちろん災害後の状況にも反映することである。

ルワンダでは国家土地委員会(National Land Commission: NLC)が先導役となり国家土地利用および土地開発に関するマスタープラン策定に向けて力を注いでいる。2010 年 8 月にその草稿が政府に提出された^{*23}。土地利用対策の担当は自然資源省となっている^{*26}。防災・難民省とルワンダ建築機関 (Rwanda Housing Authority) によって建設の際の手順シートが開発された。そのシートは豪雨や強風による被害を軽減させるものである。タンザニアでは国家土地政策(National Land Policy (1995))が安全な土地の供給に関する政策を策定している。村落法(The village Act No. 5 of 199)では村役場が村落土地利用計画を策定することを定めており、住居開発政策 2000(National Human Settlements Development Policy, 2000)の村落開発計画の項でも村落土地利用計画に従うように定めている。2007 年に土地利用計画法(Land use planning Act No. 6 of 2007)が制定され、土地利用規制が中央から地方自治体まで、一元的に実施できるようになっている。

ウガンダでは食糧保障がリスクの一つとしてあげられる。国家では国所有農業地を建設中である。ウガンダの湿地は米作のために排水されている。湿地の縮小は、一部雨季の洪水の増加や、乾季の水不足の原因となっている。洪水と干ばつの危険の特定のためのプログラムは、陸稲の生産に適応するための米生産者の奨励による湿地の再生を含んでいる^{*31}。国際農業研究所(The National Agricultural Research Organization)が病気や干ばつに対する抵抗力に対する調査を行っている^{*31}。

ハザードマップの作成や地すべりの可能性がある地区に居住している世帯の登録が進んでいる。国家開発計画において防災の主流化が進んでおり、全てのセクター計画において統合される予定である^{*31}。湿地のマッピングは湿地の境界線や湿地の中での人間の活動を抑制するために水・環境省によって行われる予定である。

ケニアでは国家開発計画およびプロジェクトによって防災の主流化が進んでおり、防災の主流化が強調されている。DRSRS では作付けの状況についての早期警報を提供し、農業省は食糧の状況についての情報を提供している。建築基準制度を開始する計画はあるが、実施に向けての構造や専門家が不足しており、実行には至っていない。生活基準の改善も予算が不足しており実現していない^{*4}。

タンザニアでは国家レベルの食糧保障チームが存在し、年に二回の食糧保障および栄養アセスメントを実施している。食糧安全保障や栄養アセスメントの地方分権化が進められており、2010年6月に2州（リンディ州、ムツワラ州）^{*4}において試行され、食糧安全保障および栄養アセスメント報告書を作成した。

ブルンジでは食糧安全保障、環境保護、貧困削減および気候変動対策に対するプログラムがある。土地利用計画は土地利用・都市計画省の管轄である。洪水警戒地域や不安定な土地に住む住民を国家災害リスクマネジメントプラットフォームにおいてコントロールすることは容易ではない。彼らは土地所有に際して必要な手続きを取っていないためである。土地管理に関するマスタープランが作成される予定である。

建築基準法について、大半の建物は決まった土地に定められた手順により土地を用意や、デザインが進められているが、建設の段階になると、その建物が基準に沿って建設されているかを適切に管理する制度がない。ブルンジの大部分は大地溝帯の上であり、毎日のように地震が起こっている。しかしながら大半の地震は小さなもので、建物による被害は目立って出ないため、建物の強度が問題視されない現状がある。

2.3.5 効果的な災害対応のための備えの強化

機関や災害脆弱地域の人々やコミュニティが良く備え、有効的な災害対応の知識やキャパシティをもっていれば、災害時の被害は軽減することができる。

緊急対応

緊急対応は意思決定分野、実行分野、政策分野、予算、担当機関などのいくつかのセクターにまたがる活動である。そのため、調整組織が必要となる。調整組織は内閣府または災害を担当する省に設置されていることが多い。

ウガンダの場合、内閣府にある国家緊急調整・運営センター(National Emergency Coordination and Operations Centre: NECOC)が政府系の緊急対応機関の調整やネットワークを担っている。しかし NECOC はまだ完全に活動しているわけではない。60の区においては区緊急調整・運営センターが存在する^{*32}。

ケニアの場合、国家災害活動センター(National Disaster Operation Centre: NDOC)が国家レベ

ルの災害対応の調整・運営を目的として 1998 年に設立された。NDOC は国家災害調整委員会(National Disaster Coordination Committee: NDCC)の決定を実施する他、指令が省や局に伝わっていることを確認することが任務である^{*17}。一方で、ブルンジやタンザニアでは緊急オペレーションセンターはまだ設立されていない。ブルンジ政府は国家、地域、地方レベルでの緊急オペレーションセンター(Un Centre National d'Opérations d'Urgences)設立に対してのアクションプランを有している^{*14}。タンザニア政府では国家緊急オペレーションセンターはまだ設立されていない^{*4}が、タンザニア緊急対応計画 (TEPRP) を立ち上げた。ザンジバルではザンジバル緊急対応計画(ZEPRP)及びザンジバル災害コミュニケーション戦略(ZDSC)が制定されている^{*4}。

他の緊急対応組織として、国連機関は災害の情報を収集し、それを広めるための緊急調整グループを立ち上げた。緊急調整グループの主要な焦点はハザードや災害の情報を入手したら直ちに関係政府機関 (特に内閣府) と連絡を取ることである^{*4}。加えて、タンザニア災害運営政策草案では災害対応チームは災害や緊急時に対応するために全てのレベルに設置されるべきであることを言及している^{*30}。ルワンダでは国家および地方レベルの全ての機関は新たな活動を実施する際や、必要書類の提出を求められた際、または何かを出版する際に防災・難民省に知らせる義務がある^{*27}。

EAC 加盟国の緊急対応に関して、各国の災害対応に対する進捗具合は異なる段階にある。ケニアでは国家災害対応計画が存在する^{*18}。タンザニアでは災害管理局が国家緊急対応計画を整備した。ルワンダの防災・難民省は防災サイクルとともに災害リスク管理計画を整備し、セクター別の対応計画が存在する^{*21}。第一次対応チームが設立され、緊急時は防災・難民省が戦略会議を開くことになっている。

ブルンジでは国家緊急対応計画があり、全ての災害について全関連セクターが参加している。災害後のアセスメントは存在するが、対応計画は存在しない。ウガンダでは保健、洪水、地すべりについてのセクター別の対応計画が存在する^{*4}。

EAC イニシアティブはアフリカ開発銀行(African Development Bank: AfDB)の支援によりビクトリア湖上救援センターを設立した。このプロジェクトは次にあげる 5 つの主要な要素から成り立っている：1) 光ファイバーケーブルのネットワークデザイン、2) 安全のための湖上コミュニケーションシステム、3) 地域的な ICT 技術(Information and Communication Technology)の初期運営やメンテナンス、4) 民間連携モデルのための特別車両の整備、5) プロジェクトマネジメント (プロジェクト調整局の強化)^{*10}。

このイニシアティブには強化の必要性があることを述べておく。

能力強化

EAC 地域では災害に備えたり対応したりするために能力強化を行っている。ルワンダでは政府機関主導で能力強化計画が実行されており、難民省のための国家災害機関の設立に向けた研修が行われた他、ケニア国家災害活動センターの支援により災害委員会 (Disaster Management Steering Committee)、災害管理特別委員会(Disaster Management Task Force: DMTF)が設立された^{*24}。タンザニアは国連と協力し、国家災害対応能力強化プログラムを行った。このプログラムは内閣府およびタンザニア赤十字の財務的支援により、コミュニティにて救助器具を配布しながらの緊急災害対応についての訓練を行うことができた^{*4}。また、ケニア国家災害活動センターでは緊急対応活動を行った。このセンターは災害軽減、コミュニティ啓発、避難訓練、コミュニティ開発、災害対応調整の役割を担っているが、予算と資源配分のための政策枠組みがないため、国家災害活動センターの能力強化プログラムは限られたものとなっている。

ブルンジでは情報とコミュニケーションシステムが発達している^{*4}。ルワンダの場合は、

2011年9月までに緊急時災害コミュニケーションシステムが政府アクションプラン(2011-2012)によって開発された^{*21}。国内のいくつかの場所において緊急対応のための備品が準備された。また新たな実験として防災・難民省はコミュニケーションの円滑化を狙い、社会課の職員全員に携帯電話を配布するキャンペーンを行った^{*25}。防災・難民省職員および災害主要項目は災害管理について国連と協働で市の災害力強化においての訓練を行った。

ウガンダではセクター別の能力強化が厚生、水、環境、エネルギーと鉱山の分野で図られているほか、国家防災技術職員能力強化研修が政府間開発機構(Intergovernmental Authority on Development: IGAD)、国連交際防災戦略(United Nations International Strategy for Disaster Reduction: UNISDR)、国連研修・研究運営サテライトプログラム(the United Nations Institute for Training and Research Operational Satellite Applications Programme: UNOSAT)、United States African Command (US AFRICOM)の協力によって行われている。また、防災局によって能力強化研修が定期的に行われている。

2.4 EAC 加盟国の災害リスクマネジメント国家戦略計画における活動

EAC 加盟国では防災や災害管理に関する行動が取られている。表 9 は EAC 加盟国において災害リスクマネジメントに関連して既に取りられている動きを示している。

表 9 EAC 加盟国における災害リスクマネジメント戦略計画によるアクション^{*14, *16, *21}

	ブルンジ	ケニア	ルワンダ	タンザニア	ウガンダ
防災行政組織の設立	■	■	■	■	■
緊急対応・防災	■	■	■	■	■
政策・戦略策定及び実行	■	■	■	■	■
減災	■	□	■	■	■
機材購入	■	■	□	□	□
中央と地方の協力体制	□	□	■	■	■
国際的協力(EAC)	□	■	□	■	■
防災への気候変動対策 戦略の統合	■	■	□	■	■
脆弱性分析	■	■	■	■	■
モニタリング・早期警報システム	■	■	■	■	■
防災予算の確立	■	■	□	□	□
防災に関する啓蒙（ワークショップ、メディアの利用など）	■	■	■	■	■
防災に関する情報の流布	■	□	□	■	■
能力強化、防災トレーニング	■	■	■	■	■
教育プログラム	■	■	■	■	■
コミュニティ防災	■	■	□	□	■
防災政策へのジェンダー問題の統合	■	■	■	■	■
被害者への社会保障、保険支払い	■	■	□	□	□
復興政策	□	□	■	□	□
防災の主流化	□	■	□	■	■

■: 戦略プランを有する国

■: 戦略はないが、行動は取られている国

□: アクションが取られていない国

2.5 EAC 加盟国での災害リスクマネジメントに係る国際プロジェクト

様々な災害リスクマネジメントプロジェクトが国際ドナーにより実施されているおり、その数はケニアで最も多く、次にタンザニアで多い。ケニアおよびタンザニアの災害の発生回数と経済規模の関係がプロジェクト数の偏りに関係していると思われる。しかしながら、

他の加盟国も災害に対して脆弱性を持っている。ブルンジ、ルワンダ、ウガンダにおいては防災についてのプログラムがより活発に行われることが期待される^{*2,*5,*6,*7,*8,*10}。

世界気象機関(World Meteorological Organization :WMO)によるプロジェクトは SADC や ICPAC (IGAD Climate Prediction and Applications Centre :ICPAC)などの地方機関との協働で行われているが、この分野は EAC 加盟国では弱い。

EAC 加盟国においては気候変動の影響が懸念されている。主な懸念は洪水や干ばつなどの異常気象が繰り返し発生すること、乾燥地帯・半乾燥地帯の拡大、生物多様性への悪影響や作物の生産性の低下などである。

戦略（案）**添付資料 7**に記載されているプロジェクトには特定の省を対象にしたもの、現在進行中のもの、もう終了したものなど、様々なプロジェクトが含まれている。

2.6 EAC 加盟国の災害リスクマネジメントに関する資金

EAC 加盟国での災害リスクマネジメントに関する財政状況は厳しい。現在主要な予算の出所は省ごとや地方政府などのセクター別となっている。セクター別や制限付きの予算がセクターを越えた災害リスクマネジメントや対応実現に向けての課題となっている。

災害リスクマネジメント分野において国家予算や国際予算は有効的である。しかしながら EAC 加盟国ではタンザニアのみに内閣府が管理する国家防災予算が存在する(表 10 参照)。その予算は災害対応や能力強化に使用されており、実際に国家の能力は高まっている。しかしながら、その能力は災害に対して有効的に対応するというレベルには到達していない^{*4}。復興に関しての中央政府から地方政府への予算配分はないため、タンザニアでは災害復興は通常の開発プログラムを通して行われる^{*4}。災害に面している地方政府やコミュニティを直接支援するための予算が必要である。

EAC 加盟国の全てが国家防災戦略や政策の中で国家防災予算の設立を提案している。ウガンダの国家政策は最も積極的な政策であると言え、年間承認予算の最低 1.5%を国家災害管理予算に充てることを言及している^{*32}。ブルンジやケニア、タンザニアでは全てのステークホルダーが防災予算に貢献することを提案している。この側面において、特に国際機関はこれらの国を先導するという大切な役割を担っている。

表 10 EAC 加盟国での現在および提案されている防災に関する国家予算*14, *15, *27, *30, *32

	ブルンジ	ケニア	ルワンダ	タンザニア	ウガンダ
現在				国家救援予算 (National Relief Fund)	
提案	防災特別予算 (Revention des Risques et Gestion des Catastrophes: Risk Prevention and Disaster Management: PRGC)	災害救援予算 (Disaster Relief Trust Fund Ministry Responsible for Disaster Management: MRDM and Directorates Budget Devolved funds)	災害管理予算 (Disaster Risk management Fund)	国家災害管理バスケット ファンド (National Disaster Management Basket Fund)	国家災害管理予算 (National Disaster Preparedness and Management Fund (Bill))

災害リスクマネジメント予算の各国での状況は次の通りである。

<ブルンジ> *14

災害リスクマネジメントに関する主要な省や被災地を支援するための特別予算が政府から出ている。緊急対応を含むいくつかの機関については県からの助成金が支給されている。こうした政府の努力もあるがまだ緊急救助に対しての援助や外部的な財務支援に頼っている面もある。内部のリソースについては国家予算によって調達される計画となっている。しかしこれらのリソースには限界があり、災害の大きさに応じた政府対応には活かしていない。県は迅速に追加予算を準備する義務を負っている。このように災害リスクマネジメントについての特別予算は国家戦略の中に提案されている。災害リスクマネジメント特別予算は以下の予算によって成り立っている：

- 国家予算
- 人道援助
- 民間セクターからの援助
 - ・工場・工業
 - ・建設、商業、工業
 - ・車、バイク、ボート、飛行機の所有者
 - ・銀行、保険会社
 - ・病院、薬局
 - ・商業ビル
 - ・ガソリンスタンド
 - ・葬儀など
 - ・学校、私立大学
 - ・電力、デパート

<ケニア> *15

現在国庫は災害リスクマネジメント担当省(Ministry Responsible for Disaster Management: MRDM)に対して主に救助活動のための予算を配分している。政策の枠組みが欠如しているため、全体的な災害リスクマネジメント活動実行のための予算は配分されていない。しかしながら、分野別の予算が分野計画や開発の目的で配分されている(例：農業分野、輸送分野、道路分野、水分野、保健分野、家屋建設分野)。UNDP はケニアに対して災害管理プログラムのための財政援助をしている*4。

国家災害リスクマネジメント政策(National Disaster Management Policy: NDMP)案は次にあげる3つの種類の予算を提案している。

1) 災害救援信託資金(Disaster Relief Trust Fund)

国家災害リスクマネジメント政策では災害リスクマネジメント担当省内に災害救援信託資金を設立することを提案している。資金源は国庫、民間セクター、個人、市民社会組織(Civil Society Organizations: CSOs)、開発パートナー、ステークホルダーである、この資金は管財人委員会によって管理され、国家災害と分類される災害の全ての段階(管理、予防、軽減、対応、復興、再建)において適応される。このため、県政府の能力を超える支援が期待される。

2) 災害リスクマネジメント担当省および理事会予算

国家災害管理理事会の主要な予算はMRDMを通じてケニア政府より支出される。このコア予算はパートナー機関や外部機関からのスタッフ、株、プログラム、救援活動を通して十分に検討されるべきである。

3) 開発予算

県政府は開発予算から災害管理に必要な予算をねん出する。県災害管理開発予算の配分のため、予算に関連する法の見直しを毎年行う。

<ルワンダ>*27

内閣に2012年6月に提出された国家災害管理政策に関する情報は次の通り。

政府は防災・難民省、関連省庁・機関・地方レベルの災害リスクマネジメント推進機関(予防、軽減、対応、復興)のような機関を整備するために特定・定期的・開発プログラムを通して予算を配分する。政府機関は地方での災害対応を引率していく。被災地コミュニティが災害状況に柔軟に対応できないときには執行委員会は救援援助を準備する。

災害対応に関しての主要な予算源は被災地の地方行政(区: Districts)である。災害の大きさがその区の能力を超える場合は、次の予算源として、被災地の区よりも一段階上の地方政府があげられる。防災・難民省はステークホルダーと密に連携を図り、災害発生時や災害管理の全てのプロセスにおいて応援することを目指す。

防災・難民省および政府・非政府の各種のパートナー、双務的・多国間の協力組織による災害管理に関する予算は5か年戦略の実行に使われる。

<タンザニア>*30

中央政府に国家救援予算が存在し、全てのセクターの災害対応を支援するために使用される。対応及び復興のプロセスは災害の原因や大きさによって担当セクターおよびいくつかのセクターの協力により行われる。災害対応予算はまだ少なく、災害の復興計画の妨げになっている。保険や民間セクター等、他の資金源はこれから吟味される。緊急対応予算は国の緊急対策国家予算から配分される*4。

国家災害管理政策草案(Draft of National Disaster Management Policy)の中で、政府は異なるステークホルダーが貢献できる国家災害管理バスケットファンドを設立すべきであることを

述べている。

<ウガンダ>*32

2011年時点では政府は緊急予算を有していない。しかし、ウガンダ北東部などの被災地では政府は復興途中のコミュニティを支援するためにマイクロファイナンス制度を設立した*4。

国家防災および管理政策(National Policy for Disaster Preparedness and Management)は災害リスクマネジメントに関する予算について次のような規制を設けている。

国会は有効的な活動のために総理府防災救援難民局(the Office of the Prime Minister-Directorate of Relief, Disaster Preparedness and Refugees)に必要な資源を確保することを保証する。

この政策は財務・経済開発省(The Ministry of Finance Planning and Economic Development)に内閣府と連絡を取りながら国家防災管理予算法案を作成し、内閣および国家に提案することを強く促す。この法案は年間予算の最低1.5%を国家防災管理予算に充てることについて言及している。この予算は災害の予防や管理のために使われる。国際開発機関がこの予算に貢献することを奨励する。予算の透明なアクセスメカニズムを目標とする。

首相府防災軽減・難民局(The Office of the Prime Minister - Department of Disaster Preparedness, Relief and Refugees) は予算の管理に対して責任を負う。予算運営は既存の金融規制に則り適切な省を通して行う。

2.7 EAC の災害リスクマネジメント関連文書

EAC の各分野の条約、協定、政策、戦略、基本計画等の文書の内、災害リスクマネジメントに関連する文書を取りまとめると以下の様である。

表 11 EAC 災害リスクマネジメント関連文書

No.	文書名	調印・承認年/状況
1	東アフリカ共同体創設のための条約	1999年調印
2	環境および天然資源管理協定	2005年調印
3	気候変動対策政策	2011年承認
4	気候変動対策戦略	承認待ち
5	気候変動対策基本計画	策定作業中
6	食糧安全保障にかかる行動計画	2011年承認
7	平和と安全に係る戦略	2006年承認
8	第4次 EAC 開発戦略 (2011-2016)	2011年承認
9	家畜開発政策	策定作業中
10	水資源ビジョン、政策、戦略	策定作業中

EACの災害リスクマネジメント戦略（案）を策定する際には、上記の文書との整合性を確保するものとし、特に承認海の文書については災害リスク管理マネジメントとの関連について、戦略（案）中に盛り込むものとした。

2.8 EAC加盟国各国「防災情報一覧」およびその「概略版」の作成

本業務の調査を通じて得られた情報をもとに、JICAが取りまとめている「各国防災情報一覧」及びその概要版(和文)に関し、ケニア及びタンザニアの防災関連情報を基に更新するとともに、ウガンダ、ルワンダ、ブルンジについて新たに作成した。作成・更新した「防災情報一覧」およびその「概要版」は、巻末の資料6に収録した。

3. 災害リスクマネジメント戦略（案）の作成

災害リスクマネジメント戦略は、東アフリカ地域および EAC 加盟国の災害リスクマネジメントに係る調和かつ調整されたプログラムおよび行動のための枠組みであるとともに、東アフリカ地域の持続可能な開発目標実現のための全体的な災害リスクマネジメント対策の策定・実施における加盟国および他のステークホルダーの指針となるものである。

本章では、EAC および加盟国の HFA 優先課題についての SWOT による現状分析結果、戦略（案）策定の基本方針、および戦略（案）策定の経緯について記述した。

3.1 SWOT 分析

SWOT 分析は、目標達成のため、内部要因である強み (Strengths) および弱み (Weaknesses)、外部要因である機会 (Opportunities) および脅威 (Threats) を評価する際に用いられる戦略計画ツールであり、プロジェクトやベンチャービジネスにおいて使われているものである。災害リスクマネジメントというコンセプトを EAC および加盟国における優先課題とするためには、関連機関の実施能力はもちろん、先進の実際的な解決策が必要である。本調査では、提案する戦略（案）と EAC および加盟国の現有能力が、確認されたギャップやチャレンジを適切にマッチしているかどうかを確認することを目的に、本調査で得られた現状調査結果をもとに、EAC 事務局および加盟国の HFA 優先課題に関する SWOT 分析を実施した。

EAC 事務局及び加盟国に対しての分析結果は、戦略（案）**添付資料 8** に収録した。分析結果をもとに HFA 優先課題に対しての加盟国の弱みをまとめると**表 12**（下表）のようである。災害リスクマネジメント活動を実施するうえで、機材・人材・財務的な能力不足等、様々な弱みが明らかとなっている。これらの弱みは適切な災害リスクマネジメント対応を妨げたり、災害に対しての脆弱性を強めたりする要因となるものである。特に、人材の能力不足については複数の加盟国資料や本戦略（案）策定過程の議論を通しても明らかとなっている事項である。

表 12 災害リスクマネジメントにおける EAC 加盟国の弱み

HFA 優先課題	主要な弱点
1. ガバナンスおよび政策	<ul style="list-style-type: none"> ウガンダとタンザニアを除いては災害リスクマネジメント政策や戦略が正式に承認されていない。 大多数の災害リスクマネジメント責任機関は新しく組織されたばかりで、人材、機材、財務的な能力が不足している。 災害リスクマネジメント関連の活動予算を確保する能力が不足している。 災害リスクマネジメントに関しての国境を越えた基本定款や条約が少ない。
2. リスクの特定および早期警戒	<ul style="list-style-type: none"> 既存の早期警報システムは、災害に関する全ての分野を網羅しているわけではない。 既存のハザードマップは、災害リスクマネジメントに関する分野が網羅されているわけではなく、加えてマップの定期的なアップデートがされていない。 ハザードプロファイルマッピングの標準化が不十分である。 様々なステークホルダーや一般大衆が災害リスクマネジメントの情報を取得することのできる統合的なデータベースやウェブサイトが十分ではない。 リスクアセスメントの結果がプロジェクト実施時や計画策定時に十分には活用され

HFA 優先課題	主要な弱点
	<p>ていない。</p> <ul style="list-style-type: none"> 災害リスクマネジメント活動のための予算を確保するための能力が不足している。 早期警報システムおよびアセスメントに関する専門家や機材が十分でない。 早期警報のためのコミュニケーション経路、教育、情報伝達フローが比較的遅れている傾向がある。 適切なリードタイムを持つ精巧な早期警報システムがない。 開発活動における災害によって引き起こされる社会及び他のセクターのインパクトのアセスメントが十分実施されていない。 加盟国の災害リスクマネジメント活動のモニタリング・評価の枠組みやガイドラインは十分に整備されていない。
<p>3. 知識、技術革新、 教育の利用</p>	<ul style="list-style-type: none"> 災害リスクマネジメント教育のための包括的なカリキュラムが整備されていない。 包括的な災害リスクマネジメント研修を実施するための能力を有していない加盟国がある。 災害リスクマネジメントに関する啓蒙活動が不十分である。 災害リスクマネジメント関連情報や知識に関する情報伝達ネットワークの整備が不十分である。 優れた取組事例や過去の災害から習得した知識の収集・伝達が十分ではない。 災害リスクマネジメントに関するコミュニティ内の伝統的・土地固有の知識に関する研究が進んでいない。 災害リスクマネジメント関係者や専門家のキャパシティが限定されている。 災害リスクマネジメント研究、啓蒙活動、教育に関する予算が不足している。
<p>4. 潜在的なリスク 要因の削減</p>	<ul style="list-style-type: none"> 土地利用計画の実施が不適切である。 国民の災害対応に対する認識が低い。 災害リスクマネジメントの観点からみて、環境や自然資源に対する研究が限られている。 災害脆弱地域において食糧安全保障および家畜に対する飼料安全保障が限られている。 被災コミュニティの住民や財産を対象とする財務リスク分担メカニズムが限られている。
<p>5. 効果的な対応の ための災害への 備え強化</p>	<ul style="list-style-type: none"> 加盟国の多くで災害対応のための十分な予算がない。 多くの加盟国で災害に対する標準化された対応手順がない。 効果的な対応（全レベル）のための公衆安全・緊急時対応プランが十分ではない。 水資源、輸送経路確保、食糧保障などの他セクターにおいてのプロモーション活動についての優先順位が低い。

3.2 戦略（案）作成の基本方針

災害リスクマネジメント戦略はEACの基本方針および運営上の方針に従って策定される。加えて、本戦略は、以下の示す方針およびコンセプトに基づくものとした：

- (i) 本戦略は、自然および人為に起因するハザード／災害のどちらも対象とする。
- (ii) 開発は人間中心で行われ、そして災害の影響を軽減するには、災害を招く要因となる人間の行動抑制が必要となる。このような背景から、災害リスクマネジメントは開発

課題上の問題であるとの認識が必要である。災害に強い社会を効果的に作るためには、開発課題上で災害リスクマネジメントを主流化すること（防災の視点を入れること）が必要である。この文脈で、災害リスクマネジメントは、独立した分野やプログラムはなく、他の開発セクターとの協力や協働が必要となる。本戦略は、開発課題上で災害リスクマネジメントを主流化することを通して、また、メガ・ディザスターから得られた JICA の提唱する”リスク・リテラシー”、”リダンダンシー”、”改善” という 3 つの原則を持った効果的な災害リスクマネジメント活動を提案することに重点を置くこととする。開発テーマおよび開発セクターにおいて災害リスクマネジメントを主流化するために必要とされるアクションをまとめると表 13 のようである。

**表 13 開発テーマおよび開発セクターにおける災害リスクマネジメント主流化のための
アクション**

開発テーマ・セクター	災害リスクマネジメントの主流化に向けた活動
貧困削減（子供、年配者、障害者に対する社会的保護課題を含む）	<ul style="list-style-type: none"> • 開発計画の中に貧困に対するリスクアセスメントを組み込むに際しての制約を明確化すること • 貧困に対する人々の本質、発生率、過酷さ、起こりうる障害、また、どのように貧困によって災害リスクが高まるかなどを理解するため、貧困プロファイルを作成すること • 生活水準、主たる収入源、主たる支出項目、公共サービスへのアクセスおよびサービスの質・信頼性・コストを分析すること • 貧困層が直面している主な災害リスクを分析すること • 貧困がどのようにハザード（特に生物学的および環境に起因するもの）に影響するか、その度合い、またどのようなハザードを引き起こす傾向があるかを明確にすること • 強み、弱み、貧困層の生活再建戦略を特定すること
農業および地方開発	<ul style="list-style-type: none"> • 農業および地方開発に影響を及ぼす自然災害に対するアセスメント • 農業に対する気候変動の影響アセスメント • 農業慣習が自然資源に与える影響および災害への作用に対するアセスメント • 農業や地方開発に関する政策やプログラムにどの程度ハザードや災害リスクが考慮されているかについてのアセスメント • 農業インフラの災害に対する回復力についてのアセスメント • 農業および地方開発への災害リスク軽減対策の策定
環境管理	<ul style="list-style-type: none"> • 環境の変化に影響を及ぼす要因のアセスメント • 環境ハザードの特定、および環境要因と自然ハザードの関係性の研究 • 自然ハザードの環境へのインパクトの解明 • 環境変化に対する人間の脆弱性を引き起こす原因に対してのアセスメント • 既存の環境政策、法制度、組織制度、基準のアセスメント、および災害リスクマネジメント活動実施に際してのそれらの適用性チェック • 環境管理事業の開発段階および実施中の評価段階におけるリスク・ベースの環境インパクトアセスメントの実施
水資源管理	<ul style="list-style-type: none"> • 水関連の主要なハザードおよびそのリスク特性の把握 • 脆弱性かかる水文プロセスの貢献度についてのアセスメント • 水セクターの政策・組織・法制度上の調整におけるの妥当性のアセスメント • 水資源における伝統的、あるいは地域固有の方策を統合すること

開発テーマ・セクター	災害リスクマネジメントの主流化に向けた活動
土地利用計画	<ul style="list-style-type: none"> • 災害リスクの許容範囲を特定した上で土地利用計画を使用すること • リスクマップの作成および土地利用計画でのマップの利用 • 土地利用計画における既存政策および法制度のアセスメント及びそれらの災害リスクマネジメントに際しての適応性のアセスメント • 土地利用計画の中で災害リスクマネジメントを促進する、開発のための組織体制の強化
インフラ整備	<ul style="list-style-type: none"> • ハザードについてのインフラシステムの敏感性のアセスメント • インフラに対してリスクを与える主要な自然ハザードに対する意識高揚を図ること • 主要・重要インフラにおける高い耐久性の確保 • 防護や緊急対応を含む国家インフラ保障プログラムの設立・強化 • 重要な対策についての国家警報システムの設立・強化
ジェンダー問題	<ul style="list-style-type: none"> • 広い意味でのジェンダーと開発を考える上でのリスク問題の明確化 • 開発および災害リスクマネジメント事業の採択時におけるジェンダー・ベースのリスクアセスメントの実施 • ジェンダーと自然災害パターンの関係性の明確化 • 災害対応時および復興時における女性・女児に対する配慮事項の確立 • 災害リスクマネジメント全段階においてのジェンダーバランスの確保
HIV/エイズ、他の健康問題	<ul style="list-style-type: none"> • その激甚さを含む病気の状況と流行についての研究 • 自然災害と病気の関係性の解明 • 伝染病による災害を軽減に資する、個人・コミュニティ・機関の能力強化のための研修および情報システムの実施
気候変動対応	<ul style="list-style-type: none"> • 気候変動に関連した被害および損失の範囲・程度・影響のアセスメント • 将来の気候変動シナリオ、人口増加および他のファクターを考慮した気候変動の影響がもたらしうる潜在リスクインパクトの明確化 • 気候変動に関する政策及びそれに係る予算配分を政府が実行することを確実にすること。 • 国家対応プログラムを国際イニシアティブにリンクさせること

- (iii) 加盟国では災害リスクマネジメント活動のための予算が限られている状況である。これに対応するため、EAC は、コミュニティ内での伝統的な災害対応への知識やローコストの災害対応策の研究を奨励する。
- (iv) 加盟国では国境を越えた問題や大災害に加盟国単独で対応するための資源が限られている状況である。このような問題に対処するためには、加盟国間の協力が必要不可欠である。EAC 災害リスクマネジメント戦略は加盟国間の協力体制の構築を盛り込むこととする。
- (v) 災害リスクマネジメントは経済や社会の様々なセクターに関係してくるため、加盟国政府のイニシアティブのみでは、十分な災害リスクマネジメントは達成することができない状況である。長期にわたる持続可能性を確保できるか否かは、地域の全ステークホルダーの積極的な参加、災害の影響への理解、迅速な対応、将来への備えに左右される。EAC は加盟国政府、政府内の組織、コミュニティ、民間組織、非政府組織や開発ドナー等の全ての関連機関による協力的なアプローチを率先していく。
- (vi) EAC 災害リスクマネジメントの最初の段階となる 2012 年から 2016 年については、開発課題の中で災害リスクマネジメントを主流化するため、また、コミュニティを含

む関連組織の災害リスクマネジメント能力強化のため、以下の活動に焦点を当てることとする。

- EAC および加盟国の組織・法制度を整備するとともに、組織の能力強化を行う。
- EAC 地域における災害リスク特定を含む災害情報管理を行う。
- EAC 地域内の災害リスクマネジメントについての啓蒙を行うとともに、研究活動を奨励する。
- 開発課題の中に災害リスクマネジメントの視点を持ち込むため（主流化）、加盟各国でのパイロットプロジェクトを含むプロジェクトを戦略実施の早期の段階で立ち上げることとする。この中で、開発予算が限られた中での事例であるケニアでの技術協力プロジェクト「洪水に脆弱な地域における効果的な洪水管理のための能力開発プロジェクト」で得られた知見・成果を活用し、その各国への展開を図ることとする。

3.3 戦略（案）の作成

EAC および加盟各国の現状を踏まえ、前節の基本方針にそって、以下の会議およびワークショップでの議論をへて、戦略（案）を取りまとめた。

- 第1回タスクフォース会議（2012年6月6日、ブルンジのブジュンブラで開催）
- 加盟各国パブリック・コンサルテーション会議
 - タンザニア（2012年8月7日、ダル・エス・サラーム）
 - ルワンダ（2012年8月8日、キガリ）
 - ブルンジ（2012年8月10日、ブジュンブラ）
 - ウガンダ（2012年8月14日、カンパラ）
 - ケニア（2012年8月15日、ナイロビ）
- 第2回タスクフォース会議（2012年8月20日～22日、タンザニアのアルーシャ）
- ステークホルダー・バリデーション・ワークショップ（2012年10月11日～12日、タンザニアのアルーシャ）

戦略（案）の最終案を巻末の**添付資料1**に収録した。この戦略（案）は、EACの環境および天然資源管理に関する次回のセクトラル・カOUNCILでの最終調整を経て、大臣カOUNCILで承認されることが予定されている。

戦略（案）は4章で構成されており、第1章で戦略の背景および概要、第2章で加盟国の災害リスクマネジメントの現状および事例、第3章で戦略（案）のヴィジョン、ミッション、目的、方針、戦略および行動、第4章にて戦略の実施メカニズムと実施計画を記述している。また、戦略（案）では、2012年から2016年で実施すべきプロジェクトを巻末に提案している。

なお、本レポートの巻末には戦略（案）に加え、以下を収録した。

添付資料2： 第1次現地調査主要面談者リスト

添付資料3： 各国パブリック・コンサルテーション・ミーティング議事録

- 添付資料 4： 第 2 回タスクフォース・ミーティング議事録
- 添付資料 5： ステークホルダー・バリデーション・ミーティング議事録
- 添付資料 6： 東アフリカ共同体加盟国各国防災情報及び概略版

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(<http://www.emdat.be/>) (accessed in Aug 2012)
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(http://www.unisdr.org/files/18926_africadrrinventoryfinal.pdf)
 - *3 National Progress Report on the Implementation of the Hyogo Framework of Action 2007-2009 (Prevention Web)
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添付資料 1.

東アフリカ災害リスクマネジメント戦略（案）最終案



EAST AFRICAN COMMUNITY

**DISASTER RISK REDUCTION AND
MANAGEMENT STRATEGY (2012 – 2016)**

FINAL DRAFT

**EAC SECRETARIAT
ARUSHA, TANZANIA
October 2012**

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Executive Summary

The Partner States of East African Community (EAC) are prone to natural hazards such as floods, droughts, landslides, earthquakes, lightning, as well as human-induced disasters of conflicts, urban fires, and environmental degradation among others. With increased frequency and intensity of extreme climate and severe weather events, the impacts of disasters will continue to retard developmental activities as resources for development are diverted to finance disaster emergencies. Thus, disaster risks have negative impacts on the security of lives as well as economies of the Partner States.

The existing Disaster Risk Reduction and Management (DRRM) mechanisms at the EAC sub-region reveals that adequate resources and capacities have not been set aside to effectively prevent, prepare and respond to disasters neither at the country level nor at the sub-regional level. All the Partner States have developed DRRM mechanisms and institutions at various levels of capacities, however, mostly focusing on disaster response other than disaster risk reduction. The public knowledge and awareness of disasters is still low thus making it difficult to prevent and reduce severe consequences of disasters and economic damage to the community.

As the world-wide trend, many countries and communities have realized the need to move from reactive (response actions) DRRM to proactive (prevention actions). It is a well-known fact that no country can fully insulate itself from disaster risk, but country or community will be able to save lives and minimize economic loss in the longer term by investing in DRRM activities. In addition, the international society has been discussing on how to mainstream DRRM into a sustainable development, taking into consideration for a post-Millennium Development Goals (MDGs) and a post-Hyogo Framework for Action (HFA). For reducing vulnerability and building a resilient county to disasters, it is now recognized DRRM need to be integrated in all development policies and programs at every level of society.

The EAC Partner States shares many terrestrial and aquatic trans-boundary systems and ecosystems which call for a concerted effort to protect and conserve in view of the increasing environmental disasters. The key vulnerability elements of climate change impacts, population growth, food insecurity, and dwindling resources will need to be addressed via the DRRM approach across the region. The EAC Secretariat being cognizant of this need initiated the development of a regional DRRM to comprehensively address the aforesaid issues and propose multidisciplinary and multilateral interventions to reduce or significantly arrest disaster trends in the region in support of poverty reduction, sustainable development and growth.

The EAC DRRM Strategy has been compiled through the First Task Force Meeting held in Bujumbura, Burundi in June 2012, the National Consultative Meetings in all of the Partner States in August 2012, the Second Task Force Meeting held in Arusha, Tanzania in August 2012, and the Validation Stakeholder Meeting in Arusha, Tanzania in October 2012.

This Strategy is presented in four chapters: Chapter 1 provides the background and overview of the Strategy. Chapter 2 explains the review of DRRM practice and capacities in the EAC Partner States including the applicable experience and lessons learned. Chapter 3 covers the vision, mission, objective, strategies and associated strategic actions for the DRRM of the EAC Sub-Region. The basic principles of this strategy and actions for mainstreaming DRRM in the development issues have been described in this chapter, which will help guide the DRRM activities in each sector. Chapter 4 proposes the implementation mechanism and the

implementation plan including the areas of first-track joint projects of this strategy. We thank the Japanese Government through JICA for this support.

The Vision, Mission, Objectives and the Guiding Principles of this Strategy

Vision:

To be a region of resilient communities in which Natural and human Induced hazards do not negatively impact on Socio-economic Development.

Mission:

To facilitate sustainable integration of Disaster Risk Reduction and Management practices into development plans and strategies of EAC Partner States.

Objectives:

- *To provide framework for collaboration and partnership for the EAC Partner States in Disaster Risk Reduction and Management; and*
- *To facilitate and strengthen the Disaster Risk Reduction and Management activities of the EAC Partner States in line with the Hyogo Framework for Action (HFA) 2005-2015, the Africa Regional Strategy for Disaster Risk Reduction and those successor documents.*

Guiding Principles:

- *The EAC DRRM Strategy will focus on addressing both natural hazards and human induced disasters;*
- *In order to effectively build the resilience societies to disasters, it is required to accelerate efforts to pro-actively manage the growing disaster risks by integrating DRRM into all development issues. The EAC DRRM Strategy will focus on effective DRRM activities through mainstreaming the DRRM in the development issues from every aspect.*
- *The EAC Partner States has limitations of financial resources for the DRRM activities. The EAC will promote the research activities for indigenous knowledge within the community and low cost measures in order to adopt and cope with disasters.*
- *Each individual EAC Partner State has limitations of resources for coping with the cross-border issues and large scale disasters by itself. The EAC DRRM Strategy will provide formulation of the cross-border cooperation/collaboration mechanism among the Partner States.*
- *DRRM has implications for many sectors of the economy and society, meeting the challenge of the DRRM cannot be solely a Partner States Government's initiative. The EAC will pursue a collaborative approach by all relevant stakeholders including the Partner States governments, inter-governmental organizations, communities, the private sector, non-governmental organizations and development partners.*

Acronyms and Abbreviations

AfDB	African Development Bank
AU	African Union
CBOs	Community Based Organizations
CFR	Case Fatality Rate: CFR
CSOs	Civil Society Organizations
DRC	Democratic Republic of Congo
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
DRRM	Disaster Risk Reduction and Management
DRRMU	Disaster Risk Reduction and Management Unit
EAC	East African Community
EW	Early Warning
EWS	Early Warning System
FEWS NET	Famine Early Warning Systems Network
HFA	Hyogo Framework for Action
ICPAC	IGAD Climate Prediction and Applications Centre
ICT	Information and Communication Technology
IGAD	Intergovernmental Authority on Development
IPCC	Intergovernmental Panel on Climate Change
ISDR	United Nations International Strategy for Disaster Reduction
JICA	Japan International Cooperation Agency
JIMC	Joint Intervention Management Committee
MDGs	Millennium Development Goals
NGOs	Non-Governmental Organizations
NEPAD	The New Partnership for Africa's Development
OPM	Office of Prime Minister
SADC	South Africa Development Community
RECs	Regional Economic Communities
SWOT	Strength, Weakness, Opportunities, and Threats
UN	United Nations
UNDP	United Nations Development Programme

UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNISDR	United Nations Office for Disaster Risk Reduction
UNOSAT	United Nations Institute for Training and Research Operational Satellite Applications Programme
USAID	United States Agency for International Development
WCDR	World Conference on Disaster Reduction
WMO	World Meteorological Organization
<Burundi>	
PRGC	Prevention des Risques et Gestion des Catastrophes (Risk Prevention and Disaster Management)
<Kenya>	
MRDM	Ministry Responsible for Disaster Management
NDCC	National Disaster Coordination Committee
NDMA	National Drought Management Authority
NDMP	National Disaster Management Policy
NDOC	National Disaster Operation center
NEMA	National Environment Management Authority
<Rwanda>	
DDMC	District Disaster Management Committee
DMTF	Disaster Management Task Force
MIDIMAR	Ministry of Disaster Management and Refugee Affairs
MINALOC	Ministry of Local Government
MINIRENA	Ministry of Natural Resources
NLC	National Land Commission
RBC	Rwanda Biomedical Center
REMA	Rwanda Environment Management Authority
<Tanzania>	
DMD	Disaster Management Department
EPRU	Emergence Preparedness and Response Unit
ESR	Emergency Situation Room
NEMC	National Environment Management Council

PMO	Prime Minister Office
STDRP	Strengthening Tanzania Disaster Response Project
TMA	Tanzania Meteorological Agency
ZEPRP	Zanzibar Emergency Preparedness and Response Plan
<Uganda>	
NECOC	National Emergency Coordination and Operation Centre
NEMA	National Environment Management Authority
OPM	Office of Prime Minister

Terminologies and Concepts

Biological Hazard:	Process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.
Building Codes:	A set of ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.
Capacity	A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster. Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management. Capacity may also be described as capability.
Climate	The statistics of temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count and other meteorological elemental measurements in a given region over long periods.
Climate Change	A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
Climate Change Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Such adjustment may be preventive or reactive, private or public, autonomous or planned.
Climate Change Mitigation	Human interventions to reduce the sources or enhance sinks of greenhouse gases.
Climate Variability	Seasonal shifts in mean climatic conditions such as temperature and precipitation.
Disaster	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. A disaster is a function of the risk process. It results from the combination

	of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.
Disaster Mitigation	Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.
Disaster Risk Management (DRM)	The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural and manmade hazards and related environmental and technological disasters. This comprises all forms of activities including structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.
Disaster Risk Reduction (DRR)	The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid or to limit the adverse impacts of hazards, within the broad context of sustainable development.
Early Warning	The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.
Early Warning System	A functional system for generation and provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response.
Emergency Management	The organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.
Climate Impact Assessment	The practice of identifying and evaluating the detrimental and beneficial consequences of climate change on natural and human systems
El Niño Southern Oscillation (ENSO)	A complex interaction of the tropical Pacific Ocean and the global atmosphere that results in irregular episodes of changes in sea surface temperatures accompanied by either above or below average rainfall in the tropics and Pacific Rim countries resulting to La Nina and El Niño conditions associated with droughts and flooding respectively.
Food Security	Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and

	healthy life, FAO World Food Summit, 1996, Rome.
Geological Hazard	Geological 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. Geological 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.
Global Warming	Intensifying greenhouse effect resulting from anthropogenic actions, where the consequence is an increase in the concentration of greenhouse gases, aerosols or their predecessors in the atmosphere, which absorb part of the infrared radiation emitted by the Earth's surface, thus increasing the average temperature on the planet and causing adverse climatic phenomena.
Hazard	A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydro meteorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity, frequency and probability.
Hydro-Meteorological Hazards	Process or phenomenon of atmospheric, hydrological or oceanographic nature 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.
Mitigation	Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.
Natural Hazards	Natural processes or phenomena occurring in the biosphere that may constitute a damaging event. Natural hazards can be classified by origin namely: geological, hydro meteorological or biological. Hazardous events can vary in magnitude or intensity, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.
Natural Disaster	An extreme event in which a natural hazard interacts with individual and community exposure and vulnerabilities to trigger negative social and economic impacts on a scale that is beyond the coping capacity of the affected population.
Non-Structural	Any measure not involving physical construction that uses

Measurement	knowledge, practice or agreement to reduce risks and impacts, in particular through policies and laws, public awareness raising, training and education.
Preparedness	The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.
Prevention	The outright avoidance of adverse impacts of hazards and related disasters.
Recovery	The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.
Resilience	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.
Response	The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.
Risk	<p>The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic disruption or environmental damage) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally risk is expressed by</p> <p>The notation Risk = Hazards x Vulnerability. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability. Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.</p>
Risk Assessment	A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend on.

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.
Structural Measures	Any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard-resistance and resilience in structures or systems;
Sustainable Development	Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.
Technological hazards	A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards.

Chapter 1: Background and Overview of the Strategy

1.1. Background

Global observations on natural hazards indicate that there is a global increase in the number of disasters and their total economic impacts. A number of severe weather and extreme climate-related events in recent years have led to disasters of devastating consequences to many societies, thus arousing even keener interest of the general public and policy makers.

The East African Sub-Region is prone to natural hazards such as floods, droughts, earthquakes, landslides, strong winds, lightning and their secondary impacts of diseases and epidemics. Drought, floods, landslides and epidemics are the most frequent disasters in the Sub-Region. In order to address and effectively minimize impacts of disasters in the region, legal and institutional frameworks are necessary along with the other capacities required for this purpose. Furthermore, the East African Community (EAC) is part of the global community and hence needs to integrate Disaster Risk Reduction (DRR) into its programmes and planning in line with the Hyogo Framework of Action (HFA) and the Africa Regional Strategy for DRR.

Many countries and communities have realized the need to move from reactive (response actions) disaster risk management which has been based on emergency and crisis management to a proactive (Prevention actions) which is based on the analysis of vulnerability, risk evaluations, and situational assessments with a view to mitigate disasters impacts before they occur. This paradigm shift calls for effective application of early warning systems, effective communication and knowledge sharing in order to increase the resilience of the communities.

The EAC Disaster Risk Reduction and Management (DRRM) Strategy will focus more on this proactive model and will also focus on prospective (future actions) which requires prevention, risk analysis to be part of development planning, programs and projects. It is one of the ways to consolidate sustainable development in the partner state and in the region as a whole.

In the EAC Sub-Region, rainfall distribution and the physiographic of the region plays an important role in determining where certain types of hazards are more prevalent. For example, the Lake Victoria Region is known for its very active and convectional weather resulting in heavy thunderstorms, lightning and flooding in the low lying areas.

Mean annual precipitation in the EAC Sub-Region is indicated in **Figure 1**. Most part of Kenya is arid or semi-arid land, and central part of Tanzania is low-rainfall area. The annual average precipitation is 1,272mm in Burundi, 630mm in Kenya, 1,212mm in Rwanda, 1,071mm in Tanzania and 1,081mm in Uganda. The annual precipitation of Kenya is about half that of other countries.

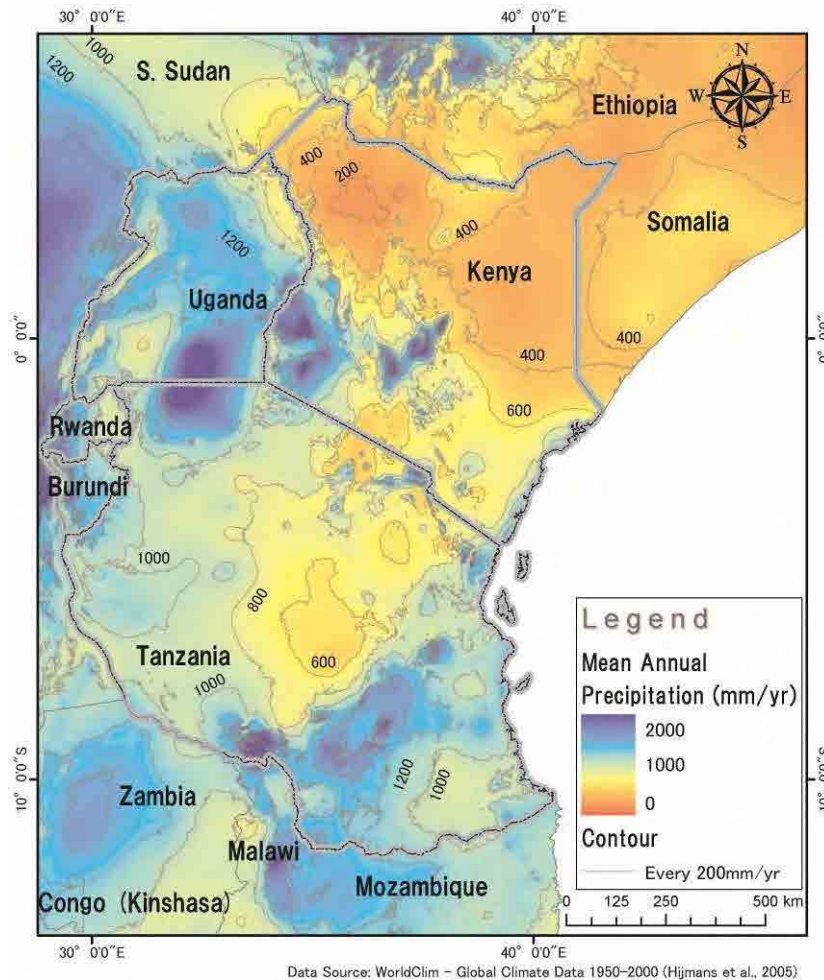


Figure 1 Mean Annual Precipitation in the EAC Sub-Region

1.2. Disaster Risk Management Cycle

DRM is a cyclical process (Figure 2). When reasonable measures to deal with natural disasters are carried out, the situation of natural disaster risk could be kept, and the DRM cycle is sustainable. This cycle contributes to stabilizing social conditions. However, lack of measures on disasters causes a rise in natural and manmade disaster risk and impedes economic growth. Thus, mainstreaming and implementing DRM is an important factor for sustainable development (Figure 3).



Figure 2 Disaster Risk Management Cycle

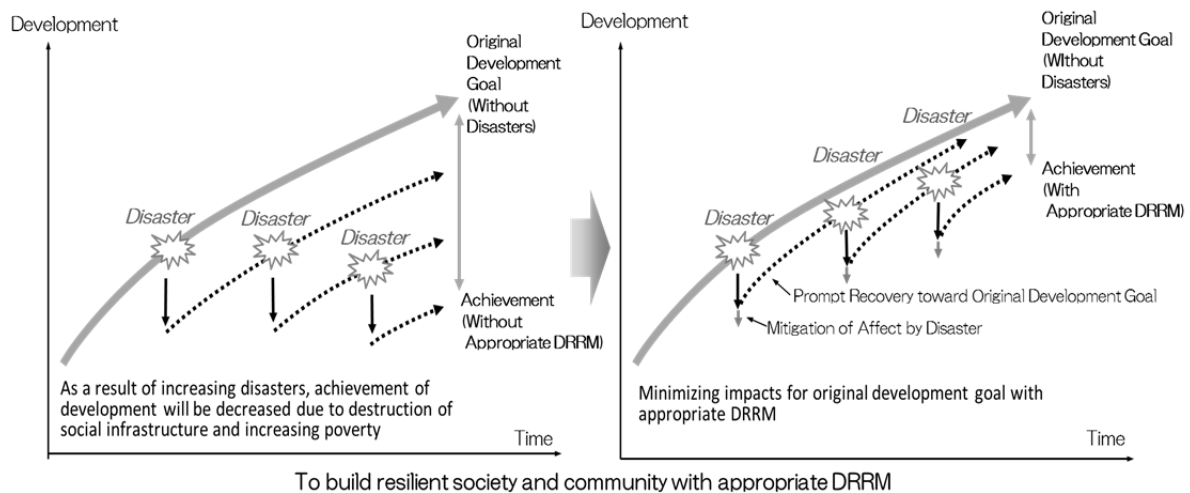


Figure 3 Affect to Development Plan induced by Disasters

1.3. Context to DRRM Strategy

The EAC aims at widening and deepening co-operation among the Partner States in, among others, political, economic and social fields for their mutual benefit. To achieve the aims, EAC has mid-term development strategies. The latest one is “The 4th EAC Development Strategy 2011/12-2015/6”.

In the strategy, DRRM is included in some priority areas, such as “Promotion of Regional peace and Security” in the Development Objective 4 and “Sustainable natural resource management, environmental conservation, and mitigation of effects of climate change across the East African Region” in the Development Objective 6. In the former one, coordination and strengthening of disaster management center was referred, and in the latter one, implementation of the African Regional Strategy for Disaster Risk Reduction and the Hyogo Framework for Action was referred.

Based on the strategy above, the process for formulating a Sub-Regional DRRM Strategy started with the EAC First Meeting of the Sectoral Council on Environment and Natural Resources in October 2011. The objective of the meeting was to consider the progress made in the implementation of the previous decisions and directives of the Council and the Summit on environment and natural resources.

In the meeting, the Sectoral Council noted the following:

- (i) Commended the EAC Secretariat for the initiative of recognizing and prioritizing the need for a disaster risk management function at the regional level;
- (ii) Took note with appreciation of the support received from the UNISDR to the EAC Secretariat on Technical Assistance on DRR;
- (iii) Took note of the progress made on disaster risk management at the EAC Secretariat through the signing of the EAC/UNISDR Memorandum of Understanding;
- (iv) Directed the EAC Secretariat to mobilize resources to establish the Disaster Risk Management function;
- (v) Directed the EAC Secretariat to convene a meeting of experts on disaster risk management to review the status of disaster risk management and consider the draft terms of reference for the EAC Disaster Risk Management Strategy;

- (vi) Directed the EAC Secretariat to establish a clear mechanism for working together and sharing information on DRR at the national, regional and international level and in particular addressing drought and flood disasters in the region;
- (vii) Directed the EAC Secretariat to establish a formalized structure at the EAC Secretariat to address Disaster Risk Reduction and Management in the region; and
- (viii) Directed the EAC Secretariat to ensure that the Disaster Risk Management function reports to the Office of the Secretary General.

Following the meeting above, “Disaster Risk Reduction (DRR) Meeting for the Establishment of an EAC Sub-Regional Platform” was held in June 2012, as well as “Task Force Meeting For Development of DRMS” was held at the same time in June 2012 in Burundi.

The consideration of the priority areas for the implementation of the EAC DRR framework were below;

- i) Priority 1. Development of an EAC DRRM Strategy
- ii) Priority 2 Resource Mobilization for integration of DRRM into EAC plans and programmes
- iii) Priority 3. Establishment of Sub-Regional DRR Platform
- iv) Priority 4. Operationalization of a Disaster Risk Management Unit within the EAC Secretariat
- v) Priority 5. DRR capacity development in the EAC Sub-Region

The “National Consultative Meetings on the Development of an EAC Disaster Risk Reduction and Management (DRRM) Strategy” were held in all of the EAC Partner States from 7th to 15th August 2012. “The Second Task Force Meeting on the Development of an EAC Disaster Risk Reduction and Management Strategy” was held in 20th – 22nd August 2012.

In line with these meetings above, a draft Strategy was reviewed in the “Stakeholders Validation Workshop on the EAC Disaster Risk Reduction and Management Strategy” in October 2012.

1.4. Hyogo Framework for Action (HFA) 2005 – 2015

The international community has set targets for global sustainable development and poverty reduction under Agenda 21 in the Millennium Development Goals (MDGs)^{*3}. The Hyogo Framework for Action (HFA) 2005-2015 also mentioned sustainable development. The HFA, **“Building the resilience of Nations and Communities to disasters”** was the negotiated outcome of the World Conference on Disaster Reduction (WCDR) which took place in Kobe, Japan on January 2005 and attended by 168 governments. Since then, the HFA became the World blue print for DRR whose expected outcome is the substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries.

Three strategic goals were agreed upon to guide the implementation of the HFA as;

1. *Integration of DRR into sustainable development policies and planning.*
2. *Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards*
3. *The systematic incorporation of risk reduction approaches into the implementation of*

emergency preparedness, response and recovery programmes.

HFA proposed five (5) key priority areas for DRR implementation and identified actions as bench marks for the governments. Five (5) key priority areas are as follows:

Priority Area 1 Governance and policy:

To ensure that DRR is a national and local priority with a strong institutional basis for implementation

Priority Area 2 Risk identification and Early Warning:

To identify, assess and monitor disaster risks and enhance Early Warning (EW)

Priority Area 3 Use knowledge, innovation and education:

To build a culture of safety and resilience at all levels

Priority Area 4 reducing the underlying risk factors:

On environment, Climate Change, food security, gender, financial risk-sharing mechanism and land-use planning

Priority Area 5 Strengthen disaster preparedness for effective response:

Guidelines and Indicators package

Required actions in the above key priority areas are shown in ANNEX 1.

1.5. The Africa Regional Strategy

The Africa Regional Strategy for Disaster Risk Reduction was formulated through the initiatives of the African Union (AU), the New Partnership for Africa Development (NEPAD) and the United Nations International Strategy for Disaster Reduction (ISDR), and consequently negotiated and approved by the African countries in 2004. Subsequently, the Programme of Action for the Implementation of the Africa Strategy was developed and adopted in 2005. The Programme of Action was prepared with the overall goal to “*reduce the social, economic and environmental impacts of disasters on African people and economics, thereby facilitating the achievement of the MDGs and other development aims in Africa*”.

Like the HFA, the Strategic Areas of Intervention were identified as;

1. Increased political commitment to DRR.
2. Improved identification and assessment of disaster risks.
3. Increased public awareness of disaster risk reduction.
4. Improved governance of DRR.
5. Integration of DRR in emergency response management.
6. Overall coordination and monitoring of the implementation of the Strategy.

DRR actions and plans of Regional Economic Communities (RECs), members of the AU, in the above strategic areas have remarkable significance for Africa DRR Strategy. The Africa Regional Strategy for DRR mentioned that RECs and other stakeholders have key roles to play in the implementation and monitoring of the Strategy.

1.6. Socio-Economic Impacts by Disasters in the EAC Partner States

The EAC is a regional intergovernmental organization, which consists of the Republics of Kenya, Uganda, the United Republic of Tanzania, the Republic of Rwanda and the Republic of Burundi. The total population and annual population growth rate in the EAC Sub-Region is about 133 million and 2.6 %, respectively ^{*1}. The total population in the EAC Sub-Region is more than 10% of the entire African region

EAC Sub-Region is prone to natural hazards. As proof, the annual percentage of the population that is affected by droughts, floods or extreme temperature events in the EAC Sub-Region is higher than the median of the world (EAC: about 2.8 %, median of the world: 0.3%, average 1990-2009) ^{*2}. To make matters worse, the number of natural disasters in the Africa region has increased in recent decades. The Intergovernmental Panel on Climate Change (IPCC) pointed out that extreme precipitation event risks in the EAC Sub-Region will increase. Therefore, the necessity of DRRM is high in the EAC Sub-Region.

As mentioned above, drought and floods are the most frequent disasters in the Sub-Region. Loss of human life by these disasters is a serious problem. Moreover, the disasters affect economic activity. For example, the floods of 1997/1998 in Kenya associated with El Niño caused widespread damage across the country. In total, the flood displaced thousands of people and disrupted the livelihoods of about 1.5 million Kenyans ^{*28}. Furthermore, the 1997/1998 floods seriously damaged the water infrastructure and transport networks. The destruction of water and sanitation infrastructure could cause the prevalence of water-related diseases such as malaria, cholera, diarrhea and typhoid. In the case of 1997/1998 floods, rift valley fever came after the floods. Agriculture is also affected by floods, which destroy farmland, food processing factories, stored food and transport networks. The 1997/1998 floods caused food commodity prices to drastically increase ^{*29}. The total costs arising from the 1997/1998 floods have been estimated at Ksh 70 billion (~USD 1.0 billion) by the World Bank. It is estimated that extreme floods and drought events have the potential to reduce Kenya's Gross Domestic Product (GDP) by about 2.4% per annum ^{*30}.

For case of Rwanda in a period of ten months (Dec/2010-Sept 2011), disasters produced a complex web of impacts, which spans many sectors of the economy. During this same period, Rwanda registered 43 losses of lives and 73 people were seriously injured. Besides, 1854 houses were destroyed by heavy rains in rural areas, 2,989. 9 Ha of crops were damaged and 100 school classrooms were completely destroyed in different parts of the country. As a result, the cost of the intervention activities in terms of disaster response and recovery to assist the victims was estimated to more than 515,520,000 Rwandan francs (~825,920 USD) (MIDIMAR reports, May -September 2011).

Droughts have also significant impacts on regional economies. Especially, rain-fed agriculture, which is the dominant form of agriculture in the EAC Sub-Region, is affected seriously by droughts. In the 2003 drought period, wholesale maize prices in most urban markets in Tanzania considerably increased ^{*42}, and the crop production index in 2003 Tanzania decreased to about 85% of that in 2002 ^{*2}.

From the information above it is clear there is need DRRM in order to sustain socio economic development of EAC Sub-Region

1.7. Existing EAC Instruments for Strengthening and Supporting the DRRM Strategy

1.7.1. Treaty for the Establishment of the EAC

The objectives of the community is to develop policies and programmes aimed at widening and deepening co-operation among the Partner States in political, economic, social and cultural fields, research and technology, defense, security and legal and judicial affairs, for their mutual benefit as spelt out in Article 5 of the Treaty. The Treaty also provides for the strengthening and consolidation of co-operation in agreed fields that would lead to equitable economic development within the Partner States and which would in turn, raise the standard of living and improve the quality of life of their population. Disasters have been known to retard and even reverse socio-economic development. They are cross-cutting and cross border issue as well. This is one field that the Partner States must come together and consolidate efforts to overcome their negative impacts.

1.7.2. Protocol on Environment and Natural Resources

The wide scope covered by the EAC Protocol on Environment and Natural Resources creates a sound foundation for disaster risk reduction by addressing the underlying risk factors in developing and planning of the environment and natural resources for socio-economic development. It provides a proactive way of reducing risk and vulnerability and hence increasing the resilience of the communities. Training communities to live in harmony with nature and natural ecosystems is currently being promoted as an ecosystem-based approach in disaster risk management.

Article 23 and 24 focus on combating desertification and mitigating effects of drought and effects of climate change. Article 35 on environmental disaster preparedness and management also stipulates the need for the Partner States to collaborate both in preparedness and response in order to effectively address Environmental disaster emergencies. Disaster Risk Reduction and Management (DRRM) Strategy will help to concretize the operations of the protocol on environment and natural resources.

1.7.3. Climate Change Policy, Strategy and Master Plan

The adverse impacts of climate change being aggravated by increasing average global temperatures are threats to the livelihoods of people in almost all sectors of the economy in the EAC Sub-Region. Severe droughts, floods, landslides and indeed extreme weather phenomena are occurring with greater frequency and intensity in the region. This is impacting on all development sectors such as water, agriculture and food security, infrastructure and transport, energy, health and threatening all the other drivers of economic development. To address these impacts, the EAC secretariat developed a Regional Climate Change Policy and Strategy Master Plan as frameworks to integrate and harmonize regional activities in response to climate change in the EAC Sub-Region.

The main objective for these climate change tools is to institute and implement measures which will improve the adaptive capacity and resilience of the East African Sub-Region to the

negative impacts of climate change. This will be achieved through DRRM including Early Warning, Preparedness, Emergency Response and Post-Disaster Recovery programmes. DRR is a critical tool for climate change adaptation and hence the DRRM Strategy bears strong link to the already existing climate change adaptation instruments in the region.

1.7.4. EAC Food Security Action Plan

East Africa largely depends on rain fed agriculture making rural livelihoods and food security highly vulnerable to consequences of climate variability and change. The agriculture sector provides the main occupation for over 80% of East Africans. Agriculture and livestock production in East Africa is hampered by its reliance on unreliable rainfall and the absence of water storage facilities compounded by poor land use practices and antiquated technology and farming methods. These sectors are likely to be hit harder as droughts and floods worsen, while temperatures and growing seasons change in the future.

In view of the above, the EAC has developed a Food Security Action Plan to address food insecurity in the region in line with the provisions of the EAC Treaty as set out in Chapter 18 Articles 105 -110. One of the main objectives of the EAC as set out in the treaty is the achievement of food security and rational agricultural production. The EAC- Food Security Action Plan will guide coordination and implementation of the joint programmes and projects emanating from this plan. The DRRM Strategy will also provide useful options for addressing food insecurity in the region.

1.7.5. Strategy on Peace and Security

Article 124 of the Treaty for the Establishment of the EAC, recognises the need for peace and security within the East African States. The same article spells out wide-ranging approaches for implementation in order to have a stable and secure environment within the region. This kind of environment is geared towards promoting development and harmonious living of the people of East Africa.

This Strategy goes a long way in enhancing the EAC spirit of co-operation in regional peace and security, which brings into reality the collective responsibility in provision of security by the Partner States. It covers collaboration on cross border crimes, auto theft, drug trafficking, terrorism, money laundering and other crimes. This will provide a good and conducive environment in which peace will flourish and security of persons and property will be guaranteed hence fostering development.

This initiative in the EAC Secretariat offers an excellent opportunity for development of a regional disaster response plan with clear mandates and responsibilities. The linkages for the existing mechanisms are considered in the DRRM Strategy.

1.7.6. The 4TH EAC Development Strategy (2011-2016)

The EAC Secretariat is executing its fourth development Strategy since the signing of its founding treaty. This document defines the regional priorities and strategic areas to focus on within the stipulated timeframe. It also guides the Secretariat and its Organs in defining their annual work plans. The current EAC development Strategy has given priority to the implementation of the HFA and the Africa regional DRR Strategy and its plan of action. This EAC Disaster Risk Reduction and Management Strategy have based its establishment on these two global and regional disaster management tools.

1.8. Rationale for DRRM Strategy

Recent disaster global observation data indicates that the number and victims of natural disasters tends to be increasing. The rise of disaster risk has negative impacts on the security of lives and economy. It should be noted that most of the disasters being experience are weather and climate related. They are therefore expected to increase with climate change. Under this severe situation, the necessity of comprehensive legal and institutional frameworks for natural disasters has increased. Thus, the EAC decided to formulate the “EAC DRRM Strategy”. This Strategy aims to minimize the impacts of disasters and to integrate the DRRM into its programmes and planning in line with the HFA and the Africa Regional Strategy for DRRM.

Developing a proactive strategy requires judicious utilization of accurate and timely information from research activities, studies and collected data on hazards including meteorological data.

In development of the Strategy, it is understood that disaster risks result from the interaction among natural, technological or conflict induced hazards and vulnerability conditions. The EAC DRRM Strategy will focus on addressing both natural and human induced hazards/disasters.

Chapter 2: Review of Disaster Risk Reduction and Management in the EAC Partner States

The EAC sub-region like any other region in the world is suffering from Disasters that are caused by natural and manmade hazards. In combating these Disasters each Partner state has established Disaster Risk Reduction and Management (DRRM) institutions, enacted several legislations and formed DRR Platform from National Level to Community level. DRRM is implemented by various Government and Non-Governmental Organization (NGO), International Organization and Community Based Organizations (CBO). From the assessment carried out during this study it has been realized much of the activities are on response side rather than preparedness. There is a need to move therefore from response to preparedness in order to reduce Disaster and build a community that is resilient to Disaster.

2.1 Status of Disasters in the EAC Partner States

The East Africa region is prone to natural hazards of such floods, droughts, earthquakes, landslides, strong winds, lightening and their secondary impacts of diseases and epidemics. Drought and Floods are the most frequent disasters in the region. Episodes of droughts and floods in the equatorial east Africa region associated with climate change are on the rise in terms of frequency, magnitude and intensity. The region is equally predisposed to manmade disasters such as urban fires, environmental degradation, water pollution, HIV and Aids and outbreaks of disease epidemics.

This section highlights the common disasters in the region.

2.1.1 Common Hazards Across the Sub-Region

(1) Droughts

Drought is one of the most common and significant disasters in the EAC Partner States. Especially, in the northern part of the region, Kenya and Uganda have been severely affected by droughts. For instance, eighty (80) % of the land of Kenya is arid and semi-arid land. Drought patterns in Kenya indicate a severe drought every twenty five to thirty years and a less severe drought every ten to fifteen years. There is another moderate drought which is normally followed by a good amount of rain every five to seven years.

In the 2008-2010 droughts in Kenya, damages and losses were estimated to be 12.1 billion USD, and the cost for recovery and reconstruction were estimated to be 1.77 billion USD. Also the drought affected 3.7 million people and significant reduction in economic growth of the country.

Since mid-July 2011, a severe drought has been affecting the entire East Africa Sub-Region including the Horn of Africa area. Said to be "the worst in 60 years", the drought has caused a severe food crisis across Somalia, Djibouti, Ethiopia and Kenya that threatens the livelihood of 9.5 million people^{*19}.



Photo 1 The 2009 Drought in Northern Kenya: Source <http://wwalert.wordpress.com/tag/severe-drought-in-kenya/>

In Uganda, severe droughts have occurred in the Karamoja region, North Eastern Uganda, due to a combination of dry spells and high temperatures in June-July, Karamoja experiences serious crop failures every five years. It is anticipated that the extension of the Sahara Desert further south will make Uganda more prone to drought. The 1993/1994 famine in Uganda caused mainly by drought affected over 1.8 million people in the 16 districts.

In Tanzania, drought occurs roughly every four years, and affects more than 3.6 million people. The most frequently hit regions are mainly from the north to central areas. In 2008, Zanzibar experienced severe drought in which about, 300,000 people were affected. As a consequence of this drought the Government of Tanzania has to spend huge budget to respond to the food shortage.

In Burundi, drought is a hazard that Burundi has faced since 1998. Especially, in the northern part, the situation has worsened from 2000. Drought reached the threshold of national disaster level based on the number of deaths and refugees of famine. And people went into exile in Rwanda and Tanzania due to starvation.

In Rwanda, recurrent drought incidences over the past decades, between 1998 and 2000 and annually from 2002 to 2005, have caused a serious deterioration in food security. Moreover, in 2004, when water levels in the northern lakes ebbed due partly to prolonged drought, the reduced hydropower supply caused the first major electricity crisis in the country. Thus drought has an adversely impact on key sectors.

Drought affects many key sectors, such as manufacturing, education, national security, tourism, health and nutrition, water and sanitation, agriculture and livestock, environment and forestry, energy, and so on. Therefore, economic losses and damages caused by droughts should be considered for all of the sectors above.

(2) Floods

Flood is also one of the most common and significant disasters in the EAC Partner States. Floods occur due to natural factors like flash floods, river floods, and coastal floods.

Kenya's record of flood disasters indicate the worst floods recorded in 1961-1962 and 1997-1998, the latter ones being the most intense, widespread and severe. During the season, the flooding was associated with the El Nino phenomenon, a weather pattern that affects most parts of the world.

The El Nino phenomenon causes increased rainfall in some areas and drought in others thus changing the normal weather patterns.



Photo 2 Flash floods in Dares-Salaam, Tanzania
Source: Disaster Management Department

Northern and eastern parts of Uganda are prone to floods. In Tanzania, floods occurred 15 times from the 1980's. The number of deaths is 54 persons and 800,271 people were affected. In recently Tanzania has experienced increased urban flooding, which is mainly due to climate change. Areas prone to disasters in Tanzania are Morogoro, Dar es salaam, Kilimanjaro and Coast region for Tanzania mainland and Urban West Region for Zanzibar.

In Burundi, flood is ranked third in the inventory of hazards and disasters.

The largest one occurred around Lake Tanganyika from 1961 to 1964. The water level of Lake Tanganyika rose 4 meters to 777.6 meters in May – June 1964. Bujumbura and other municipalities around Lake Tanganyika, the port of Bujumbura, and roads around Lake Tanganyika were flooded. This flood severely disturbed the economic activities around Lake Tanganyika. In 1983 and 1986, Bujumbura experienced a severe flood. The flood caused huge economic losses and the losses were estimated over 1 billion Burundian francs.



Photo 3 Kayosha River after Flood in Bujumbura Burundi,
Source: JICA Survey Team

The damage by the flood in 1983 was destruction of houses, deterioration of machinery and equipment in industrial areas, destruction of stocks of companies, and the port of Bujumbura

Floods are also common in Rwanda, and they have increased in frequency over the past decade. From January to September 2012 flood disaster took life of 34 people, 1920 houses have been totally destroyed and 2387.7 has of maize, beans, banana and rice have also been destroyed. All these among others resulted in the damage of infrastructure, agricultural losses, led to environmental degradation, population displacement and fatalities.

Floods cause death due to drowning, and floods destroy public health facilities such as water resources and sanitation facilities. Floods also trigger outbreaks of water borne diseases and malaria, hence compounding community vulnerability to health hazards. Besides, floods also cause physical damage by washing away structures, crops, animals and submerging human settlements. Thus floods also affect many key sectors. Effects of floods are shown below.

- Loss of livelihood including destruction of crops, death of farm animals, loss of fishing equipment, loss of other working equipment.

- Destruction of settlements and houses
- Destruction of infrastructure mainly roads, telecommunication lines and power lines.
- Erosion of productive layers of the soil rendering the soil less productive.
- Loss of food reserves
- Death and injury of both population and animals
- Mental and physical stress (e.g. anxiety, depression, loss of security, domestic problems)
- Health –related problems (contamination of water resources, sewage problems etc.)
- Nutrition problems- lack of food as the floods destroy food reserves
- Increased diseases and epidemics especially water related ones like diarrhea, dysentery, typhoid, and cholera due to contamination of water resources.
- Increased conflicts over water resources

(3) Landslides



Photo 4 Landslide in Uganda;

Source

<http://www.kfm.co.ug/news/over-3000-people-at-risk-in-bududa.html>

In Uganda, landslides are one of the most significant hazards; especially the area around the Mt. Elgon area is prone to landslides. Even this year, 25 June, 2012, a landslide occurred and 8 people were killed. The worst event occurred in 2010, when heavy rainfall triggered a landslide that killed over 300 people. In Kenya, the situation around the Mt. Elgon area is almost the same.

In Burundi, landslides fall into the background of natural hazards and disasters in recent decades, and socio-economic impacts have been increasing. In 1996, Bujumbura was almost cut off from the rest of the country because landslides blocked the National Highways 1, 4 and 7.

Landslides and mudslides are rapid movement of a large mass of mud, rocks, formed from loose soil and water. And also slow mass movement of soils is included. It usually follows heavy rainfall and high ground water flowing through cracked bed rocks and earthquakes and leads to movement of soil or sediments. Landslides and mudslides are very difficult to predict but their frequency and extent can be estimated by use of information on the area's geology, geomorphology, hydrology, climate and vegetation cover as well as traditional knowledge.



Photo 5 Landslide in Rwanda;

Source: Ministry of Disaster Management and Refugee Affairs, Rwanda

The landslide that occurred along National Highway 7 damaged 2 vehicles and killed a passenger.

In Tanzania, landslides are common in loose steep hilly lands and account for 0.9 % of all disaster occurrences in the country.

Thus landslides are likely to occur in a steep slope area such as Mt. Elgon, Mt. Kenya, Mt. Kilimanjaro, and steep slopes along the Great Rift Valley. And they affect socio-economic development by blocking main roads or damage other infrastructures.

(4) Lightning

In terms of climate change, the recurrence of extreme weather and climatic events in the Partner States is increasing in intensity and frequency as a result of climate variability and climate change. In association with increasing excessive precipitation in the region, also damage caused by lightning has been increasing.

According to the World Meteorological Organization (WMO), Uganda has one of the highest rates of lightning strike deaths in the world and its capital Kampala has more days of lightning per year than any other city.

In June, 2011, lightning struck a primary school killing 20 pupils and their teacher and injuring almost 100 people more. The school building had no lightning rod for ground strikes. Around the end of June, 2011, at least 31 people died due to sporadic bolts of lightning in Uganda.

In Kenya, in the beginning of July, 2011, eight (8) members of one family died after lightning struck their grass-thatched house in the Rift Valley Province. In the end of June, 2012, three students were killed on a street, and in the beginning of July, a man and two women were killed while walking barefoot on a road and several people got injured. In Tanzania, in the beginning of June, 2012, six (6) family members were killed by lightning in their house. A heavy downpour started in the night accompanied by strong winds. An ensuing lightning struck the grass-thatched house in which six people were taking shelter.

In Rwanda, at the end of September 2011, with the heavy downpour, lightning struck 71 people among them 16 died at the place; and 55 were seriously injured. All of these happened in a period of three months only (November, 2011 – February 2012). Even if Rwanda is generally prone to lightning; some districts are more vulnerable than others likely Nyamasheke, Rutsiro, Rulindo, Musanze, Nyabihu and Rubavu (MIDIMAR, 2012) In Burundi, in the middle of February 2011, 12 students and a teacher were killed and others were seriously injured by lightning. And in October 2010, one priest and three of his church members were killed in a church during Mass. Moreover, a few days later, 3 people died following another lightning incident which destroyed at least 37 houses.

Thus damage by lightning has been increasing in the region recently.

(5) Epidemics

- Malaria

According to the *World malaria report 2011*, there were about 216 million cases of malaria (with an uncertainty range of 149 million to 274 million) and an estimated 655,000 deaths in 2010 (with an uncertainty range of 537,000 to 907,000). Malaria mortality rates have fallen by more than 25% globally since 2000 and by 33% in the WHO African Region. Most deaths occur among children living in Africa where a child dies every minute from malaria ^{*13}.

In the EAC Partner States, malaria is one of the greatest threat epidemics. Most of the Partner States are in high risk areas for malaria according to the *World malaria report 2011*. Only around 40% of the population in Kenya lives in malaria free areas.

Between 2000 and 2010, malaria admissions to hospitals and health centers with inpatient services declined by more than half in Rwanda and the United Republic of Tanzania (Zanzibar), but by smaller proportions in Kenya. Uganda and Tanzania (mainland) reported increases in malaria admissions.

In Burundi, evolution of malaria has always been progressive from 800,000 cases in 1993 to 3,000,000 in 2000 with recurring epidemics even today. The cost of medicines and mosquito nets significantly affect household incomes.

- HIV/AIDS

Sub-Saharan Africa is more heavily affected by HIV and AIDS than any other region of the world. An estimated 22.9 million people are living with HIV in the region – around two thirds of the global total. In 2010, around 1.2 million people died from AIDS in sub-Saharan Africa, and 1.9 million people became infected with HIV. Since the beginning of the epidemic, 14.8 million children have lost one or both parents to HIV/AIDS.

The social and economic consequences of the AIDS epidemic are widely felt, not only in the health sector but also in education, industry, agriculture, transport, human resources and the economy in general. The AIDS epidemic in sub-Saharan Africa continues to devastate communities, rolling back decades of development progress^{*14}.

Adult HIV prevalence exceeds 5% in Burundi, Kenya, Tanzania, and Uganda. It is 3% in Rwanda.

- Cholera

These days, cholera is a serious disease in Africa, with over 95 percent of all cases worldwide over the past two decades occurring in Africa. Cholera was one of the most devastating diseases, killing millions. But over time, the virulence of dominant strains of the disease has abated, and mortality rates have dropped sharply, particularly since a highly effective oral rehydration therapy was mastered. However, outbreak of cholera sometimes occurs even now in the EAC Partner States.

In Rwanda, in 2007, a cholera epidemic affected 3 regions and 918 cases were reported, including 17 deaths (case fatality rate: 1.85%). In August 2011, cholera killed 12 people in an outbreak in western Burundi, where more than 600 people are infected.

In Tanzania, cholera is a regular visitor to many communities in the country. One of the major outbreak occurred in 1992 when 18,526 cases including 2,173 deaths were recorded. (Case Fatality Rate: CFR 11.7%) In 1997, an epidemic which started at the end of January in Dar es Salaam accounted for 40,249 cases and 2,231 deaths (CFR 5.54%) in Tanzania.

Since 1971, Kenya has suffered several waves of cholera occurrence. From 1974 to 1989, Kenya reported cases every year with an average case fatality rate of 3.57%. Its largest epidemic started in 1997 and lasted until 1999, with more than 33,400 notified cases, representing 10% of all cholera cases reported from the African continent in the same 3 years.

According to the international federation of Red Cross and Red Crescent societies, the first cholera epidemic was reported in Uganda in 1979. In the history of the epidemic, 1998 remains the year when the biggest outbreak was recorded, with over 30,000 cases detected in almost all districts of Uganda. The most recent outbreak was reported in July 2012, with an

influx of refugees from Democratic Republic of Congo (DRC) to western Uganda, 2 people killed and 14 people were admitted as of 6 September 2012.

- Ebola

The Ebola virus was first associated with an outbreak of 318 cases of a hemorrhagic disease in Zaire. Of the 318 cases, 280 of them died—and died quickly. That same year, 1976, 284 people in Sudan also became infected with the virus and 156 died.

The viruses that cause Ebola and Marburg are similar in terms of infecting both monkeys and people. The outbreaks of these diseases are often self-contained, however, because they kill their hosts so quickly they rapidly run out of people to infect.

The Zaire strain of Ebola virus has a mortality rate of 88 percent, which is higher than either the Sudan strain of the Ebola or the Marburg virus^{*15}.

The latest outbreak in the EAC Partner States occurred in Kibaale district, Uganda, on 3 August 2012. A total of 24 probable and confirmed cases including 17 deaths were reported since the beginning of the outbreak as of 3 September 2012.

2.1.2 Other Hazards

1) Earthquakes

Tectonic activity associated with the Great East African Rift System produces earthquakes in the Rift valley and the adjacent highlands. Uganda is the most affected country by earthquakes in the EAC Partner States. The western and central parts of Uganda are prone to seismic activity. In 1994, a strong earthquake measuring 6.2 on the Richter scale hit districts in the Rwenzori region, and affected over 50,000 people.

In Rwanda, western parts are prone to seismic activities. In 2008, Rusizi and Nyamasheke (both in the western province) were severely hit by a 5.9 earthquake causing 39 deaths, more than 600 injuries and more than 2,000 people were left homeless.

In Burundi, the country is indeed on the line of the western Great Rift Valley. And there is a clear correlation between centers of earthquakes and the layout of the Rift Valley particularly in the area of Bujumbura. The earthquake of 22 September 1960 caused extensive damage. It was preceded by many premonitory quakes and its epicenter was near Bujumbura.

In Tanzania, the Great Rift Valley traverses the country forming eastern and western rift valley branches. The earthquake prone areas are along the area of Great Rift Valley.

Kenya has not experienced a serious earthquake in the recent past. However its location within the Great Rift Valley makes the country susceptible to earthquakes.

2) Volcanic Activities

There are some volcanoes along the Great Rift Valley. Kenya has several volcanic mountains, mostly extinct. The latest eruption was in 1921, and occurred in Mt. Barrier.

In Tanzania, Ol Donyo Lengai erupted in 2010. This is one of the most active volcanoes in Tanzania, and there are many records of eruption. Volcanic activity in the mountain caused daily earth tremors in Kenya and Tanzania beginning on July 12, 2007. The latest to hit parts of Nairobi city was recorded on July 18, 2007 at 8:30pm (Kenyan time). The strongest tremor measured 6.0 on the Richter scale.

The western part of Rwanda has a chain of both inactive and active volcanoes. In 2002, Nyirangongo volcano erupted in Eastern DRC and caused damage, 400,000 of the Congolese population fled to Rubavu District bordering Goma. Thus eruptions in DRC are threats to not only Rwanda but also Uganda and Burundi.

3) Tsunami

Tsunamis and earthquakes are closely linked since tsunamis are caused by earthquakes along the ocean floor. The tsunami of 26 December 2004 was the largest ever recorded in the Indian Ocean, triggered by the 3rd largest earthquake in 100 years measuring 9.2 moment magnitude. The epicenter of the earthquake was off Banda Aceh on the Indian Ocean coast of the island of Sumatra in Indonesia.

Most of eastern Africa was spared massive damage from the waves due to (a) distance from the epicenter (>6000 km), (b) the dissipation of energy of the tsunami by shallow banks in the middle of the Indian Ocean (the Seychelles banks, Saya de Malha and Cargados Carajos Shoals) and (c) at least for Kenya and Tanzania, the first and largest waves hit at low tide. In Kenya and Tanzania these factors resulted in the waves being experienced as tidal surges of 1-1.5m amplitude lasting 5-10 min. Damage recorded for eastern Africa include 11 deaths in Tanzania and 1 in Kenya, of people walking and swimming over shallow intertidal flats being trapped by advancing and receding tidal surges^{*16}.

4) Pest Infestation and vermin

These are unwanted and destructive insects and animals that attack food or livestock both during the growing and post-harvest seasons. Pest numbers increase due to one or a combination of ecological factors including among others, temperature, monoculture, introduction of new pest species, weak genetic resistance, poor pesticide management, bad weather patterns, and migration. Pests lead to damage of plants and harvested crops, consequently leading to food shortages, famine and economic stress. In Uganda, there was an outbreak of cassava mosaic virus in 1997, and it resulted in serious infestation

The increasing incidences of coffee pests and their consequent control and management have significantly constrained economical production of coffee in Kenya. These coffee pests mainly include arthropods (insect pests), pathogenic micro-organisms (diseases) and weeds. Oeke et al., (1995) estimated that from the total attainable production of eight crops (coffee included) worth US\$580 billion, about 42% or US\$ 240 billion was lost due to insect pests (15%) followed by pathogens (13%) and weeds (13%). In 1998, a total of US\$ 34 billion worldwide was spent by farmers on protecting plants from insect pests and diseases (Yudelmon et al., 1998)^{*46}.

In Uganda, a project called “Sustainable Vermin Control: Hoima and Masindi Districts of Uganda” was conducted by Uganda Conservation Foundation. Crop raiding by baboons, bush pigs, and other wildlife is the biggest source of conflict between rural communities and protected areas (PA) management authorities. This conflict situation is particularly acute in areas of high and/or increasing population density, which is the prevalent situation in and around the protected areas of Hoima and Masindi District. These areas tend to be small islands of biodiversity, with many impoverished people practicing subsistence farming right up to the edge of the forests and the parks. Whenever wildlife destroys crops, any positive attitude the resident community members have towards conservation is compromised. This results in a lack of support for the protection of these forests from the local communities, jeopardizes conservation efforts, and reductions in productivity of the agricultural lands. An undesirable side effect is that children are missing attendance at schools through the necessity to guard the crop areas from problem animals in the daytime.^{*47}

5) Conflicts

The causes of war, civil unrest, and generalized insecurity may lie in social tensions arising from failures of governance, competition for scarce resources, or factors originating in the regional or global polity and economy. Such tensions may become polarized around social, political, ideological, religious, cultural, gender, ethnic or national identities and their eruption into violent conflicts may be precipitated, deliberately or otherwise, by internal or external acts or events. Areas of conflict often correspond with areas of environmental degradation, chronic food insecurity and overpopulation.

For instance, in 2007/8, Kenya suffered its worst internal conflict infamously referred to as the Post-Election Violence (PEV). Over 1,300 people were killed in the conflict and some 600,000 displaced. Some of the displaced persons ended up in camps while others escaped to begin livelihood activities elsewhere. The violence saw the country's economic growth rate revised from the projected 7% to below 2%.

In Uganda, the major conflicts have included the war in 1979 that ousted the government of Iddi Amin, the 1980-1986 armed struggles that took place mainly in the central parts of Uganda, and the 1986-2007 armed conflicts in northern and eastern parts of the country. Other forms of unrest have taken place in form of cattle rustling in the Karamoja area. In Tanzania there has been some case of conflicts between farmers and livestock keepers, mainly in Morogoro and Manyara regions.

6) Livestock Diseases

Rift Valley Fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans. Infection can cause severe disease in both animals and humans. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock^{*17}.

East Coast Fever is probably the most important livestock diseases in Africa, causing an annual loss of 1.1 million cattle and \$168 million, as of 1992. It is found in Sudan, South Africa, the Democratic Republic of Congo, Swaziland, Zimbabwe, Zambia, Tanzania, Kenya, and Uganda^{*18}.

Rinder pest is a highly contagious and deadly viral disease with the potential to devastate cattle and other cloven hoofed animals. Peste Des Petits Ruminants (PPR) is a rinderpest-like disease of sheep and goats which causes high mortality and is spreading at an alarming rate.

Contagious Bovine Pleuropneumonia (CBPP) is a very debilitating or deadly, acute or chronic respiratory disease of cattle and other large ruminant species. Other diseases include Rabies, Anthrax, Blackleg, and Trypanosomiasis. In Tanzania, common livestock diseases that decimate animals in the country are rinderpest, foot and mouth, anthrax, Contagious Bovine Pleural Pneumonia (CBPP) and others.

7) Environmental Degradation

This phenomenon results from poor land use patterns and other practices that lead to waste and destruction of ecological patterns. Environmental degradation is exemplified by overgrazing, destructive tilling practices on sloping landscapes, monoculture, unguided and uncontrolled use of fertilizers and pesticides, bush burning, overfishing, deforestation.

In Uganda, wetland degradation occurs as a result of drainage, over-harvesting and burning for brick making, dairy farming, and crop cultivation as well as settlement and development projects like industries. Encroachment on protected areas has resulted in destruction of habitats and loss of fauna and flora. The deep waters of Lake Victoria are de-oxygenated

partly due to the depletion of the phytoplanktivorous haplochromine grazers by introduced Nile perch, indicating a need for exhaustive studies before the introduction of foreign species. Fish production in Uganda is also suffering from effects of the water hyacinth which was probably introduced by humans.

8) Urban Fires and Wild Fires

Fire hazards include the unplanned and massive burning which may cause destruction of equipment, settlements, property and life. Among the many factors that cause fire hazards are haphazard electric wiring, poor construction standards, accidents, arson and uncontrolled burning of bush or waste materials bush burning. Fires are common in industries, congested human settlements, institutions of learning and market places. The risk of fire hazards is likely to be higher with increasing exploitation of oil, gas and petroleum resources which are highly inflammable. It calls for preparedness and management of fire hazards calls for intensification of sensitization and public awareness campaigns.

In Kenya, fires are a major risk especially in industries, forests, poorly planned buildings and settlements, overcrowded areas and, where most houses are temporary in nature.

In Burundi, markets Ngozi and Gitega, the capital cities of the provinces, were totally devastated by fires can be talked as examples. No vehicle was remained at the end of the fires in the entire province. This explains how urban fire is a major risk. In Bujumbura city, urban fires of electrical origin are increasing.

In Rwanda, fires incidents are few but have caused considerable damage during their occurrence. Notable incidents include a forest fire in 2009 that spread to the top of the mount Muhabura in the Volcanoes National Park, consuming 150 hectares of the park. Another more recent incident was the outbreak in Nyagatare District that consumed 30 hectares of forest and farms.

In Tanzania, a number of urban fire incidents have been reported, mainly originating from electrical shock. Fire is a major risk in most of the unplanned settlement where there is no good access in case of a fire outbreak.

9) Invasive Alien Species

Invasive alien species (IAS) may be defined as a species that becomes established in a new environment, then proliferates and spreads in ways that are destructive to native ecosystems, human health and ultimately human welfare. Invasive species usually spread and colonize new sites because the natural controls that keep them in check in their native homelands, such as disease and predators, do not exist where they are introduced in a new habitat. IAS is found in nearly all major taxonomic groups of organisms under the following categories:

- Micro-organisms, such as bacteria and plankton;
- Plants, such as trees, shrubs and vines; or
- Animals, such as insects, reptiles, amphibians and mammals

In Uganda, the direct economic costs of invasive species are estimated to run into many billions of Uganda shillings annually. ^{*48}

Kenya has experienced a number of biological invasions, some of which have had significant consequences on socio-economic status (Keil, 1988). Notable examples include the larger grain borer (*Prostephanus truncatus*) (Hodges et al., 1983; Muhihu and Kibata, 1985), the water hyacinth (*Eichhornia crassipes*) (Hill, Cock and Howard, 1999) and *Prosopis* spp. ^{*49}

Many invasive alien plant species occur in Tanzania. The majority of these grow along rivers,

near settlements and in towns and villages where they were used as ornamental plants in gardens or used to create hedges. Several highly invasive species have been observed in formally protected areas, including even the Serengeti National Park, Ngorongoro Conservation Area, Selous Game Reserve (World Heritage Sites). These include species such as Black Wattle *Acacia mearnsii*, Giant Sensitive Plant *Mimosa pigra*, Lantana *Lantana camara*, Seringa *Melia azedarach*, Pricky Pear *Opuntia* sp, Pine Tree *Pinus* sp., Gum Tree *Eucalytus* sp., and the aquatic weeds Water Lettuce *Pistia stratiotes* and Red Water Fern *Azolla filiculoides*.^{*50}

10) Climate refugees

There is a new phenomenon in the global arena called “Climate Refugees”. A climate refugee is a person displaced by climatically induced environmental disasters. Such disasters result from incremental and rapid ecological change, resulting in increased droughts, desertification, sea level rise, and the more frequent occurrence of extreme weather events such as hurricanes, cyclones, fires, mass flooding and tornadoes. All this is causing mass global migration and border conflicts. These phenomena are already referred above; therefore, this phenomenon should be skipped.^{*51}

Other hazards are shown below.

- Allergens
- Nodding Syndrome
- Terrorism
- Strong Winds
- Land Marine and Transportation Accidents
- Mining Accidents
- Industrial Accidents
- Civil Strife
- Cattle Rustling

2.2 Statistical Analysis

Disaster records in the EAC Partner States reported to EM-DAT are shown in **ANNEX 2**. Reported disasters are drought, flood, storm, landslide, epidemic, earthquake, insects, conflicts, accidents and fire^{*1}. According to the data, the total occurrences of floods and epidemics were more than one hundred. The total occurrence of droughts was one third that of epidemics and floods, but the total victims of droughts was remarkably higher than other disasters.

Figures 4 shows occurrence of disasters and number of victims in each state from 1980 to 2010. The number of victims by droughts is increasing in every state. Epidemics and floods follow droughts. On the other hand, occurrence of epidemics or floods is increasing in every state. Floods Kenya occurred multiple times in a year. Floods in Kenya in 1961-62 and 1997-98 were the national worst flood^{*2}. The total of affected people and economic loss by floods in 1997-98 are 900,000 and US\$11,800,000, respectively. Floods in Rwanda have increased in frequency over the past decade^{*28}.

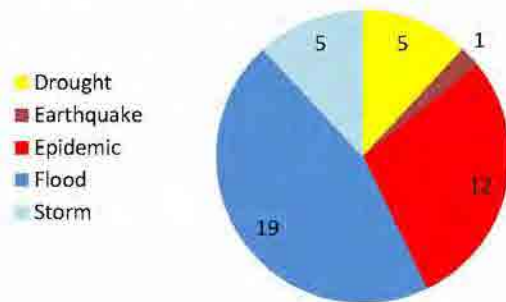
Kenya, Tanzania and Uganda are affected by floods, and the number of victims is enormous. Also floods occurred in Rwanda and Burundi; however the number of victims is not so large.

Droughts occurred about once every three years. However, droughts simultaneously occurred

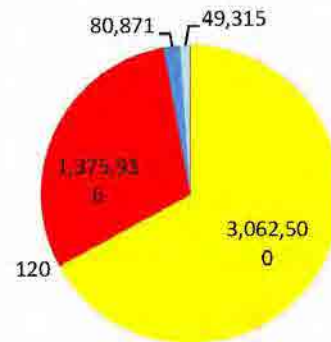
in several countries, and the victims were numerous. Thus, disaster is one of the cross border issues. Therefore, sharing disaster information within the EAC member states is very important.

In Rwanda, occurrence of disasters and the number of victims by disasters are relatively smaller than other EAC Partner States. However, Rwanda is the most densely populated country in the EAC member states, and population pressure continues to increase. Therefore, land use plan will become one of the most important tools for DRR in Rwanda. Also a land use planning is an important tool for every EAC Partner State considering development of urban areas and concentration of population to urban areas in the Partner States.

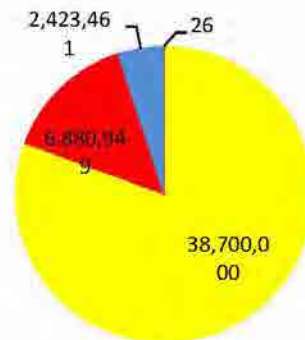
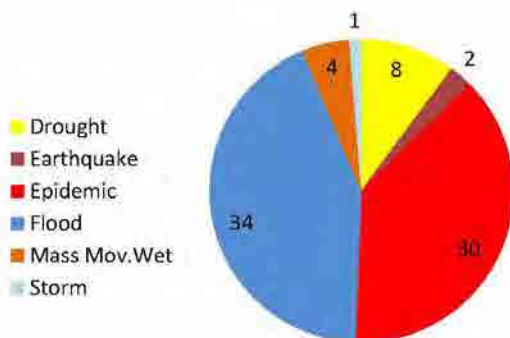
Occurrence of Disasters from 1980 to 2010



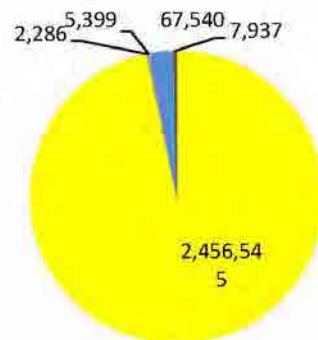
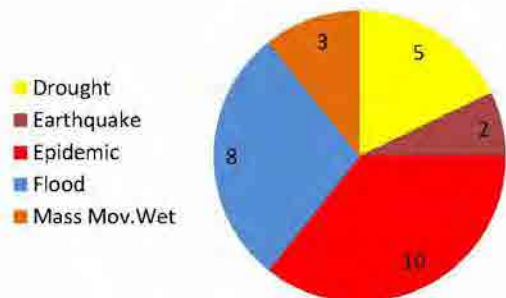
Number of Victims from 1980 to 2010



BURUNDI



KENYA



RWANDA

Occurrence of Disasters from 1980 to 2010

Number of Victims from 1980 to 2010

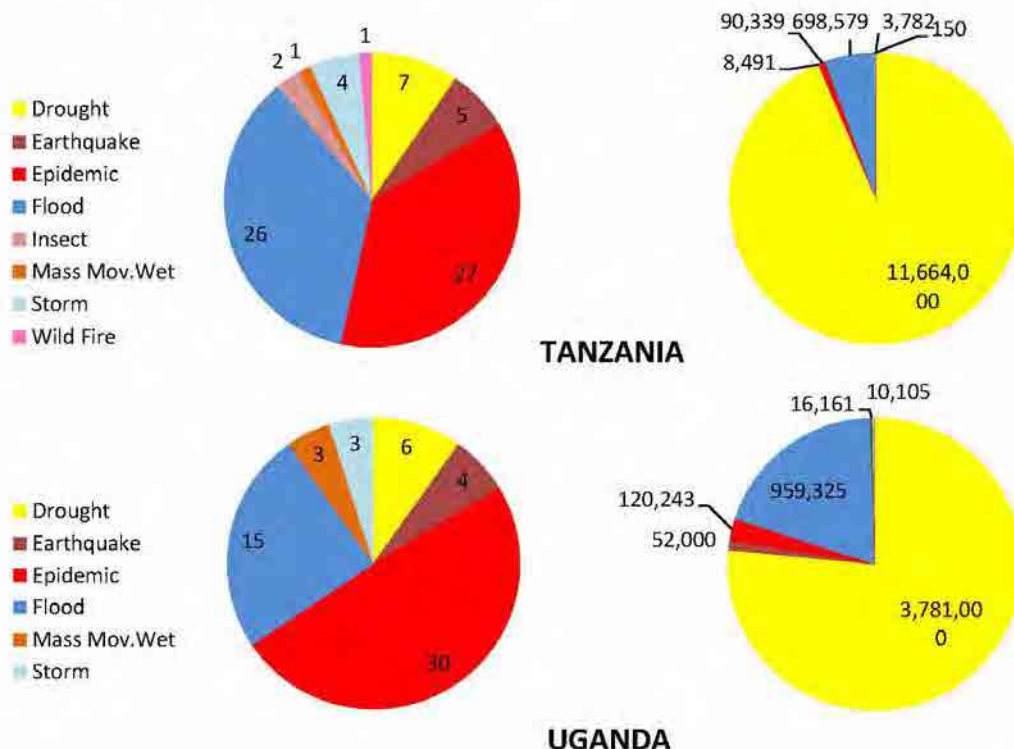


Figure 4 Occurrence of disasters and number of victims in the EAC Sub-Region from 1980 to 2010

2.3 Disaster Risk Reduction and Management Mechanisms in Key Priority Area of Hyogo Framework for Action in the EAC Partner States

There are several mechanisms in place in the Partner states for DRRM. The mechanism has been assessed based on five key priority areas of HFA that is Government and policy and strategies, Risk Identification and Early warning systems, Knowledge innovation and Education, Reducing Underlying Risk factors, and Strengthen Disaster Preparedness for Effective Response

2.3.1 Governance and Policy

Some individual partner states of the EAC Sub-Region have developed policies, legal framework, institutional frameworks and National Platforms of DRR to address DRR.

1) Policy and Legal Framework

Table 1 shows the national policies on DRR of the EAC Partner States. Although all the EAC Partner States have policies on DRR, the policies in some countries are not ratified yet by their cabinets.

There are other national policies, strategies, plans and laws related to the DRRM policies in

the Partner States as indicated in the ANNEX 3. ANNEX 4 shows DRM organizations based on new DRM policies of the EAC Partner States.

Table 1 the representative national policy for DRR

Country	DRR Policy	Formulated /approved year	Content/Current Situation
Burundi	National Policy for Risk Prevention and Disaster Management ^{*21}	Policy formulated and approved by Cabinet 2008 but not approved by Parliament	There is the National Strategy for Risk Prevention and Disaster Management and National Action Plan 2012-2015
Kenya	National Disaster Management Policy of Kenya (NDMP) ^{*22}	February 2011 the latest version formulated	Proposed and not approved yet as of 2012 This policy provides a framework for integrating existing related legislation as well as sector specific mandates, policies, strategies, contingency plans and disaster management tools.
Rwanda	National Disaster Management Policy ^{*38}	Approved in 2009	Draft of revision of National Disaster Management Policy exists as of June 2012 and submitted to the cabinet for approval
Tanzania	National Disaster Management Policy for Tanzania mainland (Existing Policy is being reviewed) ^{*40,*41} Also there is an Disaster Management Policy in Zanzibar	Approved in 2004 (It is being Reviewed) Zanzibar Policy was approved in 2011	This policy and National Operational Guidelines for Disaster Management 2003 regulates the outline of disaster risk reduction policy at all administrative levels. A new policy is proposed as of 2012.
Uganda	National Policy for Disaster Preparedness and Management ^{*44}	Formulated in 2010 and approved in May 2011. ^{*45}	This policy urges the Office of the Prime Minister – Department of Relief, Disaster Preparedness and Management to develop through a consultative process and present to Cabinet and Parliament a National Disaster Preparedness and Management bill.

The legal frameworks of DRRM in the Partner States are under formulation except in Tanzania where there is an act of parliament, “Disaster Relief Coordination Act no. 9 of 1990”.

2) Institutional Frameworks

At present, all the Partner States have an institutional framework for disaster management. On the basis of these disaster management frameworks, the disaster risk management frameworks are proposed in Burundi, Kenya, Rwanda and Tanzania and newly approved in Uganda. These proposed or approved institutional frameworks of the Partner States are as follows:

In Kenya and Rwanda, the ministries for disaster prevention exist (Ministry of State for Special Programmes in Office of the President in Kenya and Ministry of Disaster Management and Refugee Affairs (MIDIMAR) in Rwanda). In Uganda the Directorate for Relief, Disaster Preparedness and Refugees in the Prime Minister’s Office is the organization for disaster prevention while in Tanzania, the Disaster Management Department in the Prime Minister’s Office for mainland and the Disaster Management Department in the Second Vice President’s Office for Zanzibar are the responsible organization for disaster prevention. In Burundi, The directorate of civil protection in the Ministry of Public Security is responsible for disaster management.

In the all Partner States, there are disaster management committees at local levels. In Kenya, there are disaster management committees at national level, county level district level and community level^{*22}.

In Tanzania, disaster management committees exist at national regional, district, ward and village levels^{*41}. For Tanzania Mainland and there are disaster management committees at National, District, and Shehia level for Zanzibar. Non-Governmental Organizations (NGOs) also participate in the committees for continuous observation of disaster risks.

In case of Uganda, there are national disaster management committees, district disaster management committees, and sub-county/ward/village committees^{*45}.

In Rwanda, the National Disaster Management Executive Committee, District Disaster Management Committees (DDMC) and Sector Disaster Management Committee (SMDC) exist. The Committees provide relevant and timely information to the MIDIMAR for all matters related to DRRM. As a joint coordination mechanism, the MIDIMAR/the UN Joint Intervention Management Committee (JIMC) is proposed in Rwanda. JIMC is chaired by the Minister of Disaster Management and Refugee Affairs. JIMC has an advisory role to the National Disaster Management Executive Committee (NDMEC). In addition to that Rwanda has the National Disaster Steering Committee composed by relevant Ministries involved in disaster management including Ministry of Disaster Management and Refugee Affairs (MIDIMAR), Ministry of local government (MINALOC), Ministry of Natural Resources (MINIRENA), Ministry of infrastructures (MININFRA), Ministry of internal security (MININTER), Ministry of agriculture (MINAGRI) and Ministry of defense (MINADEF).

In Burundi, a National Committee, provincial and communal committees are in place to follow-up disaster management.

Institutional frameworks of the EAC Partner States are indicated in **ANNEX 5**.

3) National Platforms for Disaster Risk Reduction

National platforms for DRR are already formed at all the EAC Partner States. **Table 2** shows the title of the platforms and the participants.

Table 2 National Platforms and Secretariat of each EAC Partner States

State	National Platforms and National Focal Points
Burundi	The National Platform for Risk Prevention and Management Disaster (La Plate Forme Nationale de Prévention des Risques et de Gestion des Catastrophes) ^{*21} Secretariat: Ministry of Public Security(General Directorate of Civil Protection) -Focal points of ministries concerned with the technically DRRM -Public sector -International and local NGO -UN agencies
Kenya	National Platform for Disaster Risk Reduction (NPDRR) ^{*26} Secretariat: Ministry of State for Special Programmes; Office of the President

State	National Platforms and National Focal Points
	<ul style="list-style-type: none"> -Line Ministries -NGOs -Media -UN agencies -Academic institutions -Other stakeholders
Rwanda	<p>National Platform for Disaster Risk Reduction (NPDRR)^{*38} Secretariat: Ministry of Disaster Management and Refugees Affairs</p> <ul style="list-style-type: none"> -Focal points of all Ministries part of the National Disaster Management Executive Committee -International donors -International organizations -Red Cross movement organizations -Private sector -Sub-national DM Institutions -Local authorities (through Ministry of Local Government MINALOC) -UN agencies -International and national NGOs -Civil Society Organizations -Media
Tanzania	<p>National Platform for Disaster Risk Reduction^{*7} Secretariat: Office of Prime Minister (Disaster Management Department)</p> <ul style="list-style-type: none"> -Central and local government -Government and private institutions -UN agencies -International and national development organizations -NGOs and Community Based Organizations (CBOs) Sub- National Platform for Zanzibar Secretariat : Office of the Second Vice President (Disaster Management Department) -Ministries -UN Agencies -Media -Media -Religion/faith groups -Local government -NGOs and CBOs
Uganda	<p>National Platform for Disaster Risk Reduction (Inter-Agency Technical Committee)^{*44} Secretariat: Office of the Prime Minister (Directorate of Relief, Disaster Preparedness and Refugees)</p> <ul style="list-style-type: none"> -All Line Ministries -NGOs -Media -UN agencies -Relevant stakeholders

2.3.2 Risk Identification and Early Warning

The starting point for reducing disaster risk and for promoting a culture of disaster resilience lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities to disasters that most societies face, and of the ways in which hazards and vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge.

1) Risk Assessment and Identification

Risk assessment is the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat (also called hazard).

National and local risk assessments based on hazard data and vulnerability information for key sectors are available in Kenya.^{*7} The risk assessments are scattered in different sectors and institutions. Therefore, these institutions need to be coordinated to share their information

with other stakeholders. Currently the government has received assistance from the UNDP and has consulted with Kenyatta University to draw up a national risk assessment and vulnerability maps for Kenya^{*7}.

In Tanzania, DMD under Prime Minister Office (PMO) carried out a National Disaster Vulnerability Assessment in 2008. Assessment was conducted on multi-level administrative disaster management organizations, man-made disasters, disasters due to climate change, damage from geologic conditions, ecological disasters. DMD also conducts Comprehensive Food Security and Nutritional Assessment with National Food Security Team under the Ministry of Agriculture. These assessments are conducted with aid from the donors. At the moment the Disaster Management Department under the UNDP is carrying on Risk Vulnerability and Capacity Assessment in 15 districts. Tanzania faces following problems on risk assessment.

- Lack of a system to know of disaster occurrence and its damage and put them together at the central level. Only the National Bureau of statistics Tanzania collects the information about the damage regularly.
- Risk assessment results are not fully utilized for intervention and planning purpose due to inadequate financial resources^{*7}.
- Ability to assess the full range of consequences and vulnerabilities, especially secondary impacts, comparative economic analysis and assessing non-monetary costs^{*7}.

In Rwanda, identifying disaster high risks zones on flood and landslides were carried out in the Government Action Plan 2011-2012 by Dec. 2011^{*32}. Disaster Risk Assessment also on floods and landslides was conducted in three districts which are Burera, Masanze and Nyabihu.

In Uganda risk assessment is sector based, the Ministry of Agriculture conducts food security and agriculture related risk assessment, the Ministry of Water and Environment handles weather, floods and drought, NEMA and the Department of Disaster Preparedness and Management deal with landslides, the Ministry of Energy deals with seismic waves, and the Ministry of Health deals with disease and epidemics. Reports on those matters are submitted to the National DRR platform with recommendations of possible actions. Inter – agency risk assessments are also carried out when need arises, for example the National food security assessments organized by the National Food security sub-committee among others.

In Burundi, multi-hazard risk assessment was conducted, and 10% of schools and hospitals have been assessed. On the other hand, national standards for casualty assessment have not yet established.

2) Hazard Maps

A hazard map is a map that highlights areas that are affected or vulnerable of a particular hazard. They are typically created for natural hazards, such as earthquakes, volcanoes, landslides, flooding and tsunamis. Hazard maps are useful in disaster management in order to address prone areas to hazards

In Rwanda mapping of vulnerability and hazards in disaster prone areas were carried out in the Government Action Plan 2011-2012 by Mar. 2012^{*32}. by the Ministry of Disaster Management and Refugee Affairs.

In Tanzania, the National Land Use Frame Work Plan 2008-2028 is planning to implement hazard/risk mapping (planning stage). In Zanzibar, Disaster Risk and Capacity Needs Assessment was done in 2008 which gives the risk and vulnerability map of Zanzibar on disaster issues. Participatory needs and capacity assessment has been done in 85 Shehias

while currently the assessment is carried out in 50 other Shehias of Zanzibar (as of October 2010)^{*7}.

In Uganda hazard maps for wetlands, environment, forests, earthquakes, landslides, drought and floods are in place but not updated regularly. Earthquake hazard maps were developed in 1994, Wetlands in 1997-2000, environment in 1999, forest in 1999-2001, landslides in 2002 and is currently being updated for the Mount Elgon region, and drought/ floods are being developed^{*43}. The disaster profiles and maps will be updated at least once every 3 years^{*44}.

In Kenya, hazard maps are in place in terms of geographic maps but the UNDP is supporting the development of hazard specific maps through Kenyatta University.

In Burundi, maps are available for drought, floods and earthquakes.

The hazard maps mentioned above are not available on the internet apart from Uganda (<http://41.210.160.198:8081/>). Easy access to the hazard maps should be established.

3) Early Warning Systems (EWSs)

A warning system is any system of biological or technical nature deployed by an individual or group to inform of a future danger. Its purpose is to enable the deployer of the warning system to prepare for the danger and act accordingly to mitigate or avoid it.

In Burundi, the Ministry of Agriculture and Livestock provides the EWS in collaboration with agencies of the United Nations system. It publishes a monthly newsletter that aims to prevent a severe food crisis and to relate to the assessment of food security^{*20}. In addition, EWSs exist in some sectors such as drought, flood, rainfall, landslides, epidemic and environment.

In Kenya the EWS on drought links to a drought correspondence plan at 22 arid and semi-arid areas. Moreover, community level drought EWSs exist at 28 arid and semi-arid areas^{*6}.

In Rwanda the EWSs are in place on food security, flood, rainfall, landslides, epidemic, environment and earthquakes. There are other initiatives in a United Nations Development Programme/ United Nations Environment Programme (UNDP/UNEP) Project called "Reducing Vulnerability to Climate Change by Establishing Early Warning and Disaster Preparedness Systems and Support for Integrated Watershed Management in Flood Prone Areas" which was begun in July 2010^{*33}.

In Tanzania, there are various kinds of EWS to monitor various kinds of hazards. The systems in the government include Tanzania Meteorological Agency (TMA), Seismology Unit in Ministry of Energy and Minerals, Emergence Preparedness and Response Unit (EPRU) in Ministry of Health and Social Welfare, Plant Protection Unit in Ministry of Agriculture and Food Security. Non-governmental systems include Famine Early Warning System Network (FEWS NET). Moreover, the Disaster Management Department (DMD) of Zanzibar plans to have an Emergency Situation Room (ESR) and capacitated by the UNDP of which one of its functions is to be a central point for all sectors for issuing early warnings in the country. DMD of Zanzibar is further planning to have a comprehensive data base of disaster related information^{*7}.

In Uganda, the main institutions for EWSs are the Department of Relief, Disaster Preparedness and Management, the Department of Meteorology, Ministry of Agriculture, Animal Industry and Fisheries, Ministry of Health, Ministry of Water and Environment and the Local Governments^{*43}. EWSs exist on food security, drought, flood, rainfall, landslides, epidemic and environment sectors.

Some countries develop EWSs with assistance from international donors. In case of a joint work with international donors, there is a possibility that the international donors will take the initiative in the work in countries that do not have adequate skills to implement EWSs by themselves. Therefore, implementation of a project which builds the implementation capacity of The EAC Partner States for EWSs will be beneficial.

4) Disaster Communication and Information Flows

Disaster communication and information flow is an important aspect of the DRR. However, the critical part is the timely dissemination and flow of the early warning information.

In Burundi, there is a plan to establish a communication unit in the National Platform on Disaster Prevention and Management^{*7}.

Even though information service with local dialects is available in Kenya, one of the key constraints is accessibility to some of the remotest part of the country due to bad terrain and poor road network^{*7}. In terms of EAS, in cases of alert/ emergency rapid and coordinated action should be taken. In the remotest part of the country, there is no information system except road network, therefore bad terrain and poor road network interrupt the accessibility to the service^{*7}.

In Tanzania, weather forecast produced by Tanzania Meteorology Agency are conveyed through daily TV and Radio broadcast^{*7}. Zanzibar has distributed 16 radio calls systems for the Disaster Focal points at District level so as to communicate any disaster event in their districts. A problem on disaster information sharing in Tanzania is lack of a consolidated database or website where various stakeholders and the general public can disseminate and access data and information on disaster risk management. Normally information on disasters is shared with stakeholders, community at risk and the general public through formal communication, disaster platform, press release, radio and television programs and so on^{*7}. Another problem in Tanzania is inadequate resources for installation of a country wide disaster communication system (funds, technical know-how and IT equipment).

There is also a need to develop other means for information sharing like the Annual Government Report on Disaster Prevention and Response, Database; Web based information on disasters and so on. This should go on parallel with educating the public on the importance of making follow up on various kinds of disaster information^{*7}.

In Rwanda there is daily TV and Radio weather information produced by Rwanda Meteorological Center. Additionally, the Ministry of Disaster Management and Refugee Affairs (MIDMAR) has distributed more than 400 cell phones to sectors in charge of social affairs for the reporting of potential disaster and for disaster occurrence. This is done through an initiative called Disaster and Emergency Communication System supported by World Food Programme (WFP) that aims at communicating timely and effectively all information related to disasters by using mobile phones and servers.

ANNEX 6 shows information flows for EWSs and responsible organizations.

2.3.3 Knowledge, Innovation and Education

Disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerabilities and capacities.

Table 3 is a list of education and awareness programmes for community people and students in the EAC Partner States.

In Burundi, the United Nations Children's Fund (UNICEF) and Ministry of Education are planning to integrate DRR into education^{*5}.

In Kenya, public awareness rising is being done through the administrative units, and the media is also helping out in the awareness raising programme. A survey on needs on flood education was conducted^{*6}. A number of NGOs both international and local are also involved in the awareness in awareness rising at community level^{*7}.

Postgraduate courses introduced at tertiary institutions and DRR integration into the lower level education system is being conducted.

Tanzania conducts various kinds of programmes and workshops for its government personnel and media. A list of these programmes and workshops are as follows.

- Implementation of Strengthening Tanzania Disaster Response Project (STDRP) and Establishment of Disaster Management Training Centre (DMTC) (by United States Agency for International Development (USAID) financial support)^{*39}
- Implementation of Disaster Risk Reduction related training to Media and town planners' personnel (DMD Zanzibar)^{*7}
- Development of a curriculum about disaster risk reduction/preparation of manuals for related staff
- Zanzibar local communities were involved in the sharpening of the Disaster Risk Reduction Policy via consultative meetings which met at every Shehia, through Shehia Disaster Management Committees the same mechanism is used in the formulation of the Zanzibar Emergent Preparedness and Response Plan (ZEPRP). Their roles and responsibilities are articulated clearly in the policy and Disaster Management Act^{*7}
- DMD also organized and participate in live broadcast radio and TV programmes that were the year's theme (Making cities resilient- My city is getting ready) these were discussed among the panelists and viewers through phone calls^{*7}
- Development of an Integrated Disaster Management Training Manual (IDMTM).

In higher education, the University of Dodoma and Ardhi University in Tanzania Provide Bachelor and Master courses on DRR respectively^{*7}.

In Kenya, there are courses offered at undergraduate and post graduate level in local universities such as Masinde Muliro University, Kenyatta University and Jomo Kenyatta University of Agriculture and Technology. Another form of higher education is a network called Periperi Universities. Periperi U which stands for the Partners Enhancing Resilience to People Exposed to Risks Universities. The universities are a continent-wide network for education, training and research in disaster risk reduction. Some universities in Kenya, Tanzania, Uganda and some other African countries are included in the network.

The DMD of Zanzibar plans to integrate/mainstream disaster risk reduction concepts in the primary and secondary school curricula Through the UNDAF 2011-2015 and the Zanzibar

Strategy for Growth and Reduction of Poverty 2010-2015^{*7}. It should be noted that the abilities to implement these kinds of activities are not sufficient in Tanzania Therefore; Tanzania joins the, South Africa Development Community (SADC) and African Union (AU) to receive support from them.

In Rwanda, the DRR has been integrated in to the education system at secondary school and regular public awareness campaign conducted through media, workshops and meetings.

In Uganda, public awareness rising is being done routinely through training and education workshops, administrative units, and the media is also helping out with awareness raising programmes.

The DRR is being integrated at tertiary institutions and integration with lower level education is being conducted through the national curriculum development center.

The department of disaster preparedness has created a section in charge of awareness and early warning, fully staffed and charged with the duty to conduct technical and community education on hazards and disaster preparedness.

Table 3 Education and Awareness Programmes for Students and Communities in The EAC Partner States

Country	Educational program	Awareness Programs
Burundi		-Workshops and field trips for information and sensitization campaigns (by Office of Civil Protection in cooperation with the UNDP and members of the national platform) ^{*5}
Kenya	-Disaster risk reduction and disaster education ^{*7} -There are undergraduate and post-graduate programs for disaster management	-Workshop about tsunami at five (5) counties ^{*6}
Rwanda	-Education on sensitization about disaster risk management (in primary and secondary schools) ^{*31} -Ecology and environmental sciences courses in a department on hygiene and sanitation (in many secondary schools) ^{*31} Disaster Management Module has been developed and integrated into secondary school curriculum.	Regular public awareness campaigns are conducted through media, workshops and different meetings.
Tanzania	-the University of Dodoma and Ardhi University have established undergraduate and postgraduate degree programs on disaster management, respectively ^{*7}	- A number of DRR workshops has been carried out in Tanzania. For example conducted a two days DMD Zanzibar for students of higher learning institutions of Zanzibar as a base of exchanging knowledge and information on Disaster Risk Reduction issues (October 2010) ^{*7}
Uganda	-Hazard studies such as climate change, environment degradation, drought and flood patterns (these programmes have not been re-oriented to address disaster risk reduction related to the hazards) ^{*43} -A master program on DRR has been introduced in Makerere University -Education on disaster risk areas such	-Hazard risk management workshops conducted for the communities living in landslide prone districts in the Mt. Elgon region, flood prone areas in the Teso region.

Country	Educational program	Awareness Programs
	<p>as control of environment degradation leading to landslides, floods and soil degradation ^{*43}</p> <p>-The DRR is being integrated at tertiary institutions and integration with lower level education is being conducted through the national curriculum development center.</p>	

2.3.4 Reducing the Underlying Risk Factors

In reducing underlying risk factors, disaster risks related to changing social, economic, environmental conditions and land use, and the impact of hazards associated with geological events, weather, water, climate variability and climate change, are addressed in sector development planning and programmes as well as in post-disaster situations.

In Rwanda, there has been a major effort to generate a National Land Use and Development Master Plan, led by the National Land Commission (NLC). A draft in August 2010 was presented to the Government ^{*34}. The Ministry of Natural Resources (MINIRENA) is in charge of land use ^{*37}; again an instruction sheet on construction has been developed by the Ministry of Disaster Management and Refugee Affairs (MIDIMAR) in collaboration with Rwanda Housing Authority (RHA) to reduce disasters mainly caused by heavy rain with wind and storms.

In Tanzania, National Land Policy (1995) has formulated a policy about safe land supply. The village Act No. 5 of 199 determines a formulation of village land use plan by village offices. National Human Settlements Development Policy, 2000 mentions to obey the village land use plan in the section of a village development plan. The land use planning Act No. 6 of 2007 was formulated in 2007, and land use regulation can be implemented in an integrated way from the central level to the local governmental level.

In Uganda, Food security is at risk. National food silos are being constructed in some parts of the country. Uganda's wetlands have been drained for rice production. The degradation of the wetlands is partly responsible for increased flooding during rainy seasons and extreme water shortages during the dry seasons. Programmes to address floods and drought hazards include wetlands regeneration by encouraging rice growers to adapt upland rice production, the national Agricultural Research Organization is conducting research on disease and drought resistant crop varieties ^{*43}.

Hazard mapping and registration of households at risk of landslides is being conducted, DRR has been mainstreamed into the national development plan and is being integrated with all sector plans. Mapping of Wetlands is being done by Ministry of Water and Environment in order to establish boundaries and reduce human activities in these wetlands. The exercise is multi - sectoral

In Kenya, the DRR is being mainstreamed into the national development planning and programmes and the use of DRR is being emphasized.

DRSRS provides EW on crop performance while the Ministry of Agriculture provides information on food status in the country. There is a plan to apply building code, but the plan has not been implemented due to lack of implementing structures and not experts. Also a programme on living condition improvement has not implemented due to lack of budget ^{*7}.

In Tanzania, there is Food Security Information Team at national level, which carries out two food security and nutrition assessment every year. Currently decentralization of food security and nutrition assessment is taking place. In June 2010 two regions (Lindi and Mtwara) have been piloted and have conducted an assessment and produced their own Food Security and Nutrition Report^{*7}.

In Burundi, there exists a program of food security, environmental protection, poverty reduction and climate change adaptation. Land use plan is managed by Ministry responsible for Land and Urban planning. Human settlement in flood prone area or area with questionable stability is hard to control from DRR National Platform because they have no mandate to interfere with Land acquisition. A master plan for land management is under preparation.

Regarding building code, most of buildings that are constructed in planned area follow procedure concern design and acquisition of Building permit. However, during construction there is no proper supervision to ensure the structure follows standard. Although, most of the part of Burundi is in the Great Rift Valley and seismic waves shake the area almost every day, however most of the quakes are relatively small. Therefore, generally this is not big issue as structural disaster is not significant in Burundi.

2.3.5 Strengthen Disaster Preparedness for Effective Response

At times of disaster, impacts and losses can be substantially reduced if authorities, individuals and communities in hazard-prone areas are well prepared and ready to act and are equipped with the knowledge and capacities for effective disaster management.

1) Emergency Response

Emergency response is a cross-sectoral activity (among sectors of decision-making, armed forces, police, funding, responsible ministries for each disaster, etc.), thus coordinating bodies are required in emergency situations. Coordinating bodies are often located under the Office of the Prime Minister (OPM) or ministries responsible for disaster prevention.

In case of Uganda, the National Emergency Coordination and Operations Centre (NECOC), which is established under the OPM, is responsible for the effective coordination and networking of the various emergency response institutions of the government. But this NECOC is yet to be fully operationalized. District Emergency Coordination and Operation centers exist in 60 Districts^{*44}.

In case of Kenya, a national disaster response plan is in place. The National Disaster Operation Centre (NDOC) was established in 1998 to deal with management and coordination of disaster response at a national level. The NDOC translates the decisions of the National Disaster Coordination Committee (NDCC) into action or instructions and ensures that those instructions are transmitted and carried out by the Ministries or Departments^{*24}. On the other hand, emergency operation centers in Burundi and Tanzania have not been established yet. The Burundi Government has action plans to establish a National, Regional and Provincial Emergency Operation Centre (Un Centre National d'Opérations d'Urgences)^{*21}. Tanzania has not yet establishment a National Emergency Operation Centre. However, they have developed a Tanzania Emergency Preparedness and Response Plan (TEPRP) together with the Tanzania Disaster Communication Strategy for the mainland, while in Zanzibar, they have developed a Zanzibar Emergency Preparedness and Response Plan (ZEPRP) and Zanzibar Disaster Communication Strategy (ZDSC)^{*7}. As the other emergency body, the UN agencies have formed an emergency coordination group

which receives and disseminates disaster information. An emergency Coordination Group Focal Point is responsible to communicate with relevant government organs, specifically PMO soon after receiving any information on hazards and disasters^{*7}. In addition, the Draft Tanzania Disaster Management Policy mentioned that disaster response teams shall be established at all levels to react to disaster and emergencies^{*41}. In Rwanda, all agencies at the national and district levels will inform the concerned officials (MIDIMAR) while undertaking any new activities and submit necessary reports requested for or published by the agency^{*38}.

As a response plan in the EAC Partner States, the state of progress to prepare a disaster response plan is at different stages. A National Disaster Response Plan of Kenya exists^{*25}. In Tanzania, DMD has finalized the development on National Emergency, Preparedness and Response Plan. In Rwanda, the Ministry of Disaster Management and Refugee Affairs also has developed the disaster risk management plan with the entire Disaster Risk Reduction cycle. Sector based response plans are in place^{*32} and first responders team are being established in the whole country; apart from that the Ministry of Disaster Management and Refugee Affairs is putting in place the Strategic Stores to replace in case of emergency. In Burundi, there is a common form of Rapid Assessment Post-Disaster, but there are no response plans in Burundi. Uganda now has a National Emergency Response Plan that covers all disasters and all the relevant sectors were involved in developing this.

In the EAC, there is the EAC initiative to set up a Maritime Search & Rescue Centre for Lake Victoria supported by the African Development Bank (AfDB). The project is composed of five main components and activities namely 1) the network design and construction of Optical Fibre Cable, 2) Maritime Communication System for Safety, 3) the initial operations and maintenance of the regional Information and Communication Technology (ICT) backbone network, 4) establishment of a Special Purpose Vehicle for the Public Private Partnership model, and 5) project management (including the strengthening of the Project Coordination Unit)^{*12}. These initiatives need to be strengthened.

2) Capacity Development

Capacity reinforcement to prepare and responded to national disasters is carried out in the EAC Sub-Region. In Rwanda, the capacity development plan is in place and implemented by the government agencies with support from international agencies and Partner States, for example, training on the establishment of a national disaster command system for the MIDIMAR, Disaster Management Steering Committee, Disaster Management Task Force (DMTF), District Disaster Management Committees (DDMC) was completed with the assistance of the Kenya National Disaster Operation Center (NDOC)^{*35}.

The MIDIMAR staff and other disaster focal points were trained on disaster management; again UN- Habitat helped in training disaster focal point on making cities' resilience.

Tanzania and the UN together implement a capacity development program for national disaster correspondence. This program enables communities to conduct emergency correspondence activities by distributing equipment for rescue with financial support from the Prime Minister's Office and Tanzania Red Cross^{*7}. Kenya NDOC implements emergency correspondence activity. The centre is in charge of disaster reduction, awareness of community people, evacuation drills and community development besides coordination of disaster responses. The NDOC has a limited capacity building program because of lack of a policy framework to allow allocation of budget and resources.

Information and Communication Systems have been developed and validated in Burundi^{*7}. In case of Rwanda, development of a disaster communication system for emergencies was

carried out in Government Action Plan 2011-2012 by Sep. 2011^{*32}. Stores for emergency responses have been set up in some parts of the country, As a new experiment, the MIDIMAR launched a campaign of distributing cell phones to all staff in charge of social affairs at sectors with the aim to enhance communication on disasters^{*36}.

In Uganda, sector based capacity building programs exist in health, water and environment, energy and minerals. Capacity building training for national DRR technical staff is being conducted in collaboration with international and regional bodies like Intergovernmental Authority on Development (IGAD), the United Nations Office for Disaster Risk Reduction (UNISDR), the United Nations Institute for Training and Research Operational Satellite Applications Programme and United States African Command (US AFRICOM).

Capacity building training for districts is being regularly conducted by the department of disaster preparedness.

2.4 Disaster Risk Reduction and Management Activities in the National Strategic Plan

In the EAC Partner states there are several activities that are carried out for Disaster Risk reduction and Management

Table 4 (reference number: ^{*21, *23, *32}) is a list of existing activities in the National Action Plans of Partner States.

Table 4 Activities in Disaster Risk Reduction and Management Strategic Plan in the EAC Partner States

Content	Burundi	Kenya	Rwanda	Tanzania	Uganda
Establishment of Institutional Framework for DRRM					
Emergency Response and Preparedness					
Policy / Strategy Making and Implementation					
Disaster Mitigation					
Purchase of Equipment					
Cooperation between National and Regional Bodies					
International Cooperation (EAC)					
Integration CCA Strategy into DRRM					
Vulnerability Assessment					
Monitoring and Early Warning System					
Establishment of DRRM Fund					
DRR Awareness (Workshop, Media, etc.)					
DRR Information Dissemination					
Capacity Building, DRRM Training					
Education Program					
Community DRRM					

Content	Burundi	Kenya	Rwanda	Tanzania	Uganda
Integrate Gender into DRRM Plans					
Social Safety, Insurance Support for Victims					
Disaster Recovery Plan					
Mainstreaming of DRRM					

▨: Country with strategic plans

■: Country with no strategic plan but activities conducted:

□: No Activities

2.5 Existing International Projects and Programmes in the EAC Partner States

Programmes funded by international donors and organizations in the EAC Partner States are listed in ANNEX 7. The total number of international programmes in Kenya and Tanzania are the first and second largest numbers in the EAC Sub-Region, respectively. The large economy and much disaster occurrences and victims in Kenya and Tanzania are reflected in the imbalance of project numbers. However, other countries have also vulnerability for national disasters. It is expected to more actively perform DRR international programmes in Burundi, Rwanda and Uganda^{*5,*8,*9,*10,*11,*12}.

World Meteorological Organization (WMO) projects are conducted in cooperation with regional organizations, such as SADC and ICPAC. The Activity of EAC in this area is weak.

In the EAC Partner States, the effect from climate change causes a high concern in people. Their main concerns about climate change are the increase in occurrence of extreme weather and climatic events (e.g. floods and droughts), expansion of dry land and sub dry areas, threatening biodiversity and decrease in agricultural productivity. Some projects for correspondence to climate change are conducted by international programmes.

2.6 Disaster Risk Reduction and Management Fund

The financial condition for DRR in the EAC Sub-Region is severe. In many cases, primary funding sources for DRR and emergency response are sectoral budgets of ministries responsible or affected local governments. The subdivided and limited DRR funds are one of the challenges for “multi-sectoral” disaster management and response.

National or international funds are helpful for DRR. However, in the EAC Partner States, only Tanzania has an operational national DRR fund, which is managed by the Prime Minister’s Office for Tanzania Mainland (**Table 5**, reference number:^{*21,*22,*38,*41,*44}). The fund is used for disaster response, mitigation and capacity building; hence capacity at national level is developed. But, the capacities are not transformed into the capability to respond to a disaster efficiently and effectively on the ground^{*7}. There are no funds allocated from central to local government for recovery in Tanzania, thus most disaster recovery is undertaken through normal development programs^{*7}. It’s necessary to set aside funds in the National Budget which will directly support the local government and community facing disasters, implement some preparedness and mitigation activities.

Table 5 Current and proposed national funds in the EAC Sub-Region

	Burundi	Kenya	Rwanda	Tanzania	Uganda
Current				National Relief Fund	
Proposed	Special Fund PRGC (Prevention des Risques et Gestion des Catastrophes: risk prevention and disaster management)	Disaster Relief Trust Fund MRDM and Directorates Budget Devolved funds	Disaster Risk management Fund	National Disaster Management Basket Fund (Tanzania Mainland) Disaster Management Fund (Zanzibar)	National Disaster Preparedness and Management Fund (Bill)

All the EAC Partner States proposed DRR funds in the National DRR strategies or policies. The National Policy of Uganda is the most motivated policy, which aims to provide for annual allocation of a minimum of 1.5 % of the annual approved budget to the National Disaster Preparedness and Management Fund^{*44}. Burundi, Kenya and Tanzania, all stakeholders should contribute DRR funds. Especially, international agencies have an important role to lead them.

DRR funding status in each state is follows.

<Burundi> ^{*21}

Exceptional funds are released by the government to support the key ministries in the field of PRGC and affected areas. Some structures involved in emergency response are subsidized by the state. Despite the efforts of the government, the tendency to depend on aid and external funding for emergency relief is still marked. Internal resources are scheduled in the National Budget. However, these resources are limited and do not allow the government to cover the needs related to the magnitude of the disaster. The state is obligated to promptly mobilize an additional budget. Thus, the Special Fund of PRGC is proposed in the National Strategy. The Special Fund of PRGC will be funded by:

- The national budget
- Humanitarian aid
- Private sector contributions:
 - Factories and industries
 - Buildings in commercial and industrial
 - Owners of vehicles, motorcycles, boats and planes
 - Banks and Insurance Companies
 - Hospitals and pharmacies
 - Commercial establishments
 - Gas Stations
 - Funeral, etc.
 - Schools and private universities
 - Power and department stores

<Kenya> ^{*22}

Currently, the exchequer provides the Ministry Responsible for Disaster Management (MRDM) with funds mainly for relief activities. Due to lack of a policy framework no funds have been provided for in the budget for the overall implementation of DRR activities, but in the sectoral budgets' funds have been provided for sectoral planning and development purposes, for example in agriculture, transport, roads, water, health, and housing. The UNDP has committed some funds to the country for disaster management programmes^{*7}.

The draft of National Disaster Management Policy (NDMP) proposes the following three kinds of funds.

1) Disaster Relief Trust Fund

The NDMP proposes the establishment of a Disaster Relief Trust Fund in the MRDM. Contributions to the Fund will be from the exchequer, private sector, individuals, Civil Society Organizations (CSOs), development partners and stakeholders. The Fund will be managed by a Board of Trustees and will address all phases of disasters including: management, prevention, mitigation, response, recovery, rehabilitation and reconstruction for disasters that have been declared as ‘national disaster’ and therefore beyond the capacity of county governments to manage.

2) MRDM and Directorates Budget

A core budget for the national disaster management directorates will be provided by the government of Kenya through the MRDM. This core budget is expected to be significantly augmented through contributions of staff, stocks, programmes and relief contributions from partner organizations and external donors.

3) Devolved funds

The county governments will budget for funding of disaster management activities from devolved funds according to their disaster needs. Laws governing such funds will be reviewed in order to provide for allocation of funds from devolved kitties for county disaster management every financial year.

<Rwanda>^{*38}

Description regarding funds in the National Disaster Management Policy (submitted to cabinet in June 2012) is as follows:

The Government shall allocate a budget to equip institutions such as the MIDIMAR, Ministries/Institutions and local level for disaster risk management initiatives (prevention, mitigation, response, and rehabilitation) through specific, regular, development programs. Government institutions shall take the lead to respond to disasters at local level. The Executive Committee will mobilize relief assistance if the affected areas and communities are unable to cope with the disaster situation.

The primary source of funding for disaster responses shall come from the local administrations (districts) in affected areas. When the magnitude of the situation overwhelms the districts capacity to cope with it, the second source will be the next highest level of administration above the affected areas. The Ministry of Disaster Management and Refugee Affairs will work closely with the concerned stakeholders to provide assistance when disasters occur and collaborate regularly and mutually in all process of disaster management.

The budget allocated to disaster management by the MIDIMAR and its various partners, from governmental and non-governmental, bilateral and multilateral cooperation agencies will be used for the implementation of the Five- Year Strategic Plan.

<Tanzania>^{*41}

The National Relief Fund budget exists at the central government level to support any disaster response activities across all the sectors. The response and recovery processes are conducted by respective sectors or–multi - sectorally depending on the effects caused by the disaster. The Budget for disaster response is still minimal which leads to difficulties in planning disaster recovery. Other sources of fund like insurance and the private sector have to

be explored. The emergency fund is allocated in the National budget for emergency purposes in the country ^{*7}. It is described in the Draft of National Disaster Management Policy that the government should establish a National Disaster Management Basket Fund in which different stakeholders will be allowed to contribute to the fund.

<Uganda>^{*44}

The Government has not established an emergency fund as of 2011. But, in areas emerging from disasters such as North-Eastern Uganda, the Government established a micro-finance credit scheme to support recovery efforts of the communities ^{*7}.

The National Policy for Disaster Preparedness and Management provides following regulations regarding DRR funds.

- 1) Parliament shall ensure that adequate resources and facilities are provided to the Office of the Prime Minister - Directorate of Relief, Disaster Preparedness and Refugees to enable it to perform its functions effectively.
- 2) The policy urges the Ministry of Finance Planning and Economic Development in liaison with the Office of Prime Minister to develop and present to the cabinet and Parliament; a National Disaster Preparedness and Management Fund Bill. The bill should among others provide for annual allocation of a minimum of 1.5 % of the annual approved budget to the National Disaster Preparedness and Management Fund. The fund will be used for Disaster Preparedness and Management in the country. International and other national development partners should be encouraged to contribute to the fund. A transparent mechanism of accessing resources from the fund should be worked out.
- 3) The Office of the Prime Minister - Department of Disaster Preparedness, Relief and Refugees shall be responsible for the administration of the fund. The operation of this fund will be undertaken through the relevant ministry according to the existing financial regulations.

2.7 Applicable Experience and Lessons Learned

Based on global trends and experiences, DRR should embrace a holistic approach to disaster risk management, mitigation, preparedness, response and recovery. The following are the lesson learned from various disaster and International best practice.

2.7.1 Economic Evaluation on Disaster Risk Management Activities

In order to sensitize decision makers and the public on the need to increase investment in DRRM activities, the economic evaluation on DRRM activities is one of the effective tools. The following are representative results of the economic evaluation on DRRM activities:

A study, “The Cost of Delayed Response: Lessons from the 1999-2001 Drought in Kenya”, conducted by disaster management experts in 2002, estimated that the drought - one of the worst in 20 years – killed at least 60 percent of livestock and caused crop failures in parts of the Rift Valley, Coast, Eastern and Central provinces, costing the government some US\$343 million in food and non-food emergency aid.

Further, the study revealed that only \$171 million would have been required to effectively respond to the drought had there been an effective disaster management system in place. The extra amount was attributed to poor preparedness and a delayed response^{*27}.

Figure 5 shows one of the examples of relationship between meteorological hazards and GDP per capita growth in Kenya and Africa region. Relationships are not so clear but after big floods GDP of Kenya decreased compared to Africa region. In Kenya Vision 2030, it says that the Economic Pillar of Vision 2030 seeks to improve the prosperity of all regions of the country and all Kenyans by achieving a 10% Gross Domestic Product (GDP) growth rate by 2012. Disasters obviously harm the achievement of the Vision.

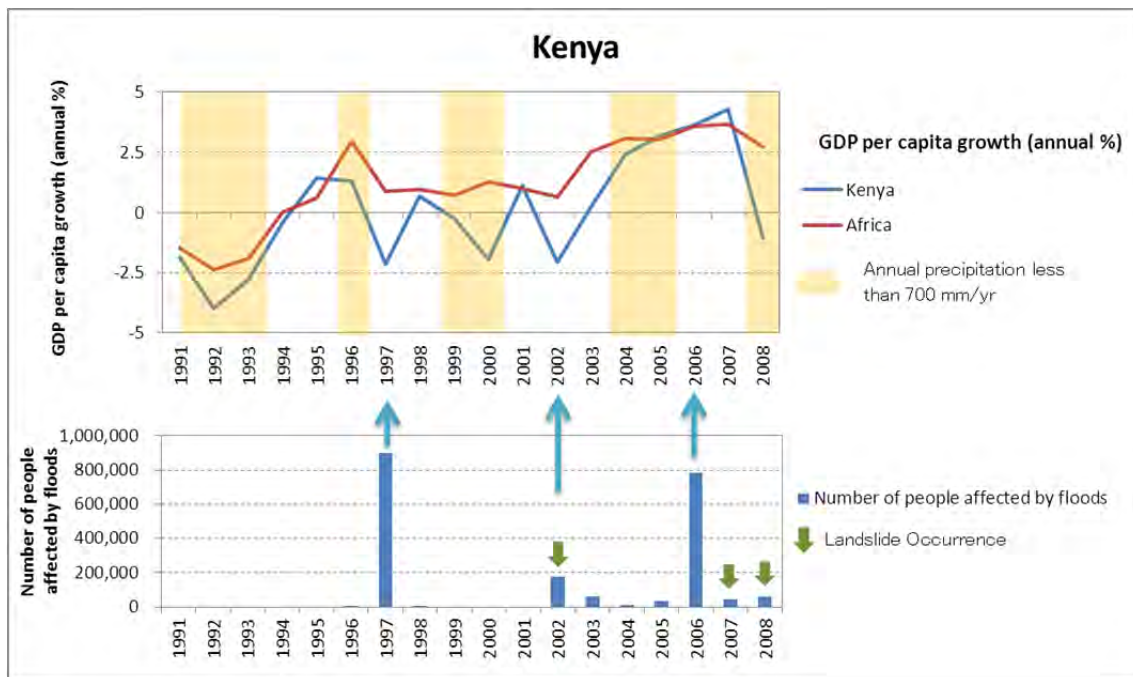


Figure 5 Relationships between Meteorological Hazards and GDP per capita growth in Kenya

2.7.2 Community-Based Disaster Risk Management Activities

Experience in Kenya

“The Programme for Community-Based Flood Disaster Management to Adapt to Climate Change in the Nyando River Basin in the Republic of Kenya” was conducted by JICA from 2010 to 2011.

The Project aims to establish a flood management system by implementing structural and non-structural measures for integrated flood management in the 24 villages of the flood prone parts of Nyando District and Kisumu District. This Programme consisted of two projects of structural measures and non-structural measures.

The project of structural measures was named “The Project for Construction of Evacuation Places and Routes”, and the project of non-structural measures was named “The project for Building Capacity on Flood Disaster Management”.

The structural measures aim at constructing: i) Evacuation places by providing an evacuation center, toilets, storage facilities, and a borehole; and ii) Evacuation routes by providing footbridges, culverts, and weirs. A total of 78 facilities were requested for the structural measures.

The non-structural measures included the development of and training for Community Based Flood Management Organizations (CFMOs). In addition, the non-structural measures covered public awareness campaigns via education programs and dissemination of information using radio programs and posters. The components of the non-structural measures were i) Development of Community Based Flood Management Organizations, 2) Community flood management training, 3) Technical O&M training for structural measures, 4) Education programs for disaster prevention, 5) Radio programs about flood management, and 6) Awareness campaign using posters about flood management

During the Project, the flood management system was developed within the Project Area comprising 24 villages. The number of direct beneficiaries of the Project was estimated at approximately 20,000 people who live in the 24 villages. In addition, the Project contributed to improving: i) The public’s awareness of flood management; ii) Evacuation safety; and iii) Flood safety in the Nyando River Basin. The O&M system was developed as part of the non-structural measures of the Project. Community Based Flood Management Organizations (CFMOs) was developed and trained in financial management, O&M, and the activities required according to the flood disaster cycle.

One of examples of the good practices of the project, in the project of structural measures, evacuation places with raising foundation to avoid floods were constructed. And in the project of non-structural measures, even residences not living in pilot project areas, they recognize the existence of activities of community flood disaster management by JICA and importance of evacuation. This is one of the good results from the radio programme regarding flood management included in the project.

Thus combined programmes of structural and non-structural measures should be considered against hazards, and also structural measures such as raising foundations of evacuation places, houses, evacuation routes, and so on against flood should be considered as a part of countermeasures.

2.7.3 Multi-lateral Disaster Risk Management Activities

There are two Multinational Organizations that conducts activities in our EAC sub region. One is ICPAC (IGAD Climate Prediction and Applications Centre) and the second is Lake Victoria Basin Commission (LVBC). This sub-chapter enumerate lesson that can be learned from these activities.

a) ICPAC

IGAD Climate Prediction and Applications Centre (ICPAC) is a specialized institution of the Intergovernmental Authority on Development (IGAD).

The key objectives of ICPAC are;

- To improve the technical capacity of producers and users of climatic information, in order to enhance the input to and use of climate monitoring and forecasting products;
- To develop an improved, proactive, timely, broad-based system of information and product dissemination and feedback, at both sub-regional and national scales through national partners;
- To expand the knowledge base within the Sub-Region in order to facilitate informed decision making, through a clearer understanding of climatic and climate-related processes, enhanced research and development, and a well-managed reference archive of data and information products.

Its member countries are – Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan and Uganda – as well as Burundi, Rwanda and Tanzania.

The mission of ICPAC is;

- Fostering sub-regional and national capacity for climate information, prediction products and services, early warning, and related applications for sustainable development in the IGAD Sub-Region.

The vision of ICPAC is;

- To become a viable centre of regional excellence in climate prediction and applications for climate risk management, environmental management and sustainable development.

Thus ICPAC aims to be a center of excellence for climate related issues. One of the core programmes of ICPAC is computer services and data management, including processing and computer applications. This kind of activity is quite useful to member countries. And organizations responsible for meteorology in each member country exchange data with ICPAC as necessary. This should become a good example as a center of excellence in the region.

b) Lake Victoria Basin Commission (LVBC)

The East African Community established the Lake Victoria Basin Commission formerly known as the Lake Victoria Development Programme in 2001, as a mechanism for coordinating the various interventions on the Lake and its Basin; and serving as a centre for promotion of investments and information sharing among the various stakeholders. The programme is the driving force for turning the Lake Victoria Basin into a real economic growth zone.

LVBC has conducted several programmes such as “Lake Victoria Environmental Management Project Phase II (LVEMP II)”, “The EAC/AMREF lake Victoria Basin HIV &

AIDS Partnership (EALP)”, “Lake Victoria Water and Sanitation (LVWATSAN) Initiatives Project”, and “Mount Elgon Regional Ecosystem Conservation Programme (MERECP)”. These projects/programmes are trans boundary projects/programmes around Lake Victoria and Mt. Elgon. And the purposes of the projects/programmes are to strengthen capacity to build coordination, and to promote harmonization.

These purposes are also in common with DRRM in the EAC Partner States. Therefore, these projects should be good reinforcement for the EAC DRRM.

2.7.4 Conferences Related to DRRM held in 2012

In 2012 two international Conferences were held concerning DRRM. From these Conferences various issues and experience concerning DRRM were shared.

a) The United Nations Conference on Sustainable Development

“The United Nations Conference on Sustainable Development” was held on 20 – 22 June, 2012 in Rio de Janeiro, Brazil. In the Conference, in sectors such as “Food Security and Nutrition and Sustainable Agriculture”, “Sustainable Cities and Human Settlements”, “Mountains”, and “Capacity Building”, the importance of considering DRR was emphasized. Thus “Disaster Risk Reduction” is recognized as a cross-sectoral issue, DRR/M should be integrated into the development goals of related sectors.

The outline of the discussion in the Conference is shown below.

- (i) Reaffirm the commitment to the Hyogo Framework for Action 2005-2015: Building the Resilience of nations and communities to disasters and call for states, the United Nations system, the international financial institutions, sub regional, regional and international organizations and civil society to accelerate implementation of the Framework and the achievement of its goals.
- (ii) Recognize the importance of early warning systems as part of effective disaster risk reduction at all levels in order to reduce economic and social damages, including the loss of human life, and in this regard encourage states to integrate such systems into their national disaster risk reduction strategies and plans.
- (iii) Stress the importance of stronger **inter-linkages** among disaster risk reduction, recovery and long-term development planning, and call for more coordinated and comprehensive strategies that integrate disaster risk reduction and climate change adaptation considerations into public and private investment, decision-making and the planning of humanitarian and development actions, in order to reduce risk, increase resilience and provide a smoother transition between relief, recovery and development.
- (iv) Call for all relevant stakeholders, including governments, international, regional and sub-regional organizations, the private sector and civil society, to take appropriate and effective measures, taking into account the three dimensions of sustainable development, including through strengthening coordination and cooperation to reduce exposure to risk for the protection of people, and infrastructure and other national assets, from the impact of disasters, in line with the Hyogo Framework for Action and any post-2015 framework for disaster risk reduction.

b) World Ministerial Conference on Disaster Reduction in Tohoku

The “World Ministerial Conference on Disaster Reduction in Tohoku~ Joint Endeavors for Solutions: Wisdom of the World to the Disaster-Affected Areas, Lessons of the Disaster-Affected Areas to the World~” was held on 3rd to 4th July, 2012 in Tohoku, Japan. The main points of the Chair’s Summary are shown below.

- i) Mainstreaming disaster reduction and building resilient societies,
- ii) Achieving human security putting human dignity at the center and paying due consideration to children, the elderly, disadvantaged persons, women and other vulnerable groups,
- iii) Maximizing disaster reduction capability through appropriately combining structural ("hard") measures such as infrastructure and Information and Communication Technology (ICT) and non-structural ("soft") measures such as education,
- iv) Forging a partnership among various stakeholders, transcending sectoral differences,
- v) Addressing emerging issues such as climate change and urbanization, and
- vi) Eyeing 2015 and beyond, incorporating disaster reduction in a post-2015 development framework as well as establishing a truly effective "post-Hyogo Framework for Action," based on the Hyogo Framework for Action and also on the major findings of the conference above, considering the paradigm shift after the Great East Japan Earthquake.

2.7.5 Experiences and Lessons Learned from “The Great Eastern Japan Earthquake, March, 2011”

JICA is now conducting a study on an approach to the “**Safe and Resilient Society**” based on the experiences and lessons from the “The Great Eastern Japan Earthquake”.

The purpose of the study is; To obtain lessons from various disastrous events, particularly the great East Japan Earthquake and; To extract new and additional viewpoints for effective DRM applicable to International community

As a result of the study, three (3) kinds of Gaps were emerged between actual capacity of society/ community and required capacity to cope with disasters

In order to fill the gaps and build a “Safe and Resilient Society”, JICA has proposed Three principles/Principles approach, consists of 1) Risk Literacy, 2) Redundancy, and 3) Kaizen (continuous improvement).

Risk Literacy:

- Bridge the gap in understanding for various countermeasures between different levels (central government vs. local authority, public administration vs. community)
- Recognize the limitations of countermeasures; pay more attention to two standards, Structure Standard and Recognition Standards.

Redundancy (Value Adding):

- Need to recognize the importance of including disaster risk management aspects into other sectors’, such as agriculture, education, health and infrastructure by the holistic program approach, including DRRM.
- Need to incorporate DRRM into long-term development Strategy for the purpose of mainstreaming DRRM.

KAIZEN (Continuous Improvement):

- The need to deal with 3 axes, a time axis, a development phase axis and a target axis, which change continuously, simultaneously and suddenly.
- The need to continuously review and revise strategies, policies, plans and projects over generations in order to put them into practice.

Chapter 3: Strategies and Strategic Actions

The Strategy is a framework for a harmonized and coordinated sub-regional and Partner States programmes and actions to address the DRRM and guide the Partner States and other stakeholders on the preparation and implementation of collective measures to address the DRRM for the attainment of set targets and goals for sustainable development in the EAC Sub-Region.

This chapter presents the result of SWOT analysis for the EAC and Partner States on the basis of the Key priority areas adopted from HFA, basic principles of the strategy formulation, and the proposed strategies and associated actions.

3.1 SWOT Analysis

The SWOT analysis is a strategic planning method used to evaluate the **S**trengths and **W**eaknesses/Limitations as internal factors, and **O**pportunities and **T**hreats as external factors, involved in a project or in a business venture. One way of utilizing SWOT is matching and converting. Matching is used to find competitive advantages by matching the strengths to opportunities. Converting is to apply conversion strategies to convert weaknesses or threats into strengths or opportunities.

Addressing the DRRM to priorities of the EAC and its Partner States is linked to the ability to implement actions through existing institutions as well as advancing practical solutions. The SWOT analysis for the EAC and Partner States was undertaken on the basis of the HFA key priority areas, with the aim of ensuring that the proposed interventions and existing capacities and abilities adequately target the identified gaps and challenges. The consultations were carried out to provide information on the current affairs through a series of interviews and the data collection survey in the Partner States.

The SWOT analysis revealed a number of existing opportunities and threats in addressing the DRRM as external factors, and strengths and weaknesses of the EAC and the Partner States as internal factors. The full SWOT analysis for the EAC secretariat and the Partner states is presented in ANNEX 8. Critical weaknesses of the Partner States are summarized in **Table 6** below. A number of critical weaknesses exist including inadequate capacities in terms of equipment, finance and human resources for the DRRM activities, which inhibit the implementation of appropriate measures, and enhance the vulnerability to the disasters. The issue of capacity in terms of resources has been identified in a number of Partner States documents, including during the consultative process for the preparation of this Strategy.

Table 6 Weakness of EAC Partner States in DRRM

HFA Key Priority Area	Critical Weaknesses
1. Governance and Policy	<ul style="list-style-type: none"> • Policies/strategies for DRM have not been ratified except Uganda and Tanzania. • Most of the organizations in charge of DRRM are newly established, therefore capacities such human resources, equipment and finance are insufficient. • Inadequate capacity for raising fund which can be used for disaster risk reduction activities. • There are limited memorandums or treaties for cross-border issues related to DRRM.

HFA Key Priority Area	Critical Weaknesses
2. Risk Identification and Early Warning	<ul style="list-style-type: none"> • Existing Early Warning Systems do not cover all sectors related to disasters. • Existing hazard profile maps do not cover all sectors for DRM and are not regularly updated. • There is limited standardization of hazard profile mapping. • Consolidated database or website where, various stakeholders and the general public can disseminate and access data and information on disaster risk management are insufficient. • Risk assessment results are not fully utilized for intervention and planning • Inadequate capacity of fund raising which can be used for disaster risk reduction activities. • Experts and equipment for EWS and assessment are insufficient. • Communication channels, education and information flow for hazard EW is relatively low in the EAC Partner States. • There is no elaborate Hazard EWS with good lead time • Assessment of social and other sector impacts induced by disaster in development activities are insufficient. • Preparation of monitoring and evaluation framework and guideline for the DRM activities for partner states is inadequate.
3. Use Knowledge, Innovation and Education	<ul style="list-style-type: none"> • There is no comprehensive curriculum to conduct DRRM education. • Some states do not have the capacity to carry out comprehensive DRRM trainings. • Public awareness campaigns for DRRM are insufficient. • There is inadequate establishment of information dissemination networks of DRRM information and knowledge. • There is inadequate collection and dissemination of good practices and lesson learned on DRRM. • There are inadequate research activities including traditional and indigenous knowledge within communities for DRRM. • Capacity for DRRM personnel and professionals is limited. • There is limited budget for DRM activities in research, awareness and education.
4. Reducing the Underlying Risk Factors	<ul style="list-style-type: none"> • There is inadequate implementation of the land use plans. • There is low public awareness. • There are limited research activities for environment and natural resources management related to DRRM. • Food security as well as feed security for livestock for the area prone to disasters is limited. • There is limited financial risk sharing mechanism covering community people and their properties affected by disaster.
5. Strengthen Disaster Preparedness for Effective Response	<ul style="list-style-type: none"> • Most of the EAC Partner States do not have enough funds for disaster response. • Most of the States do not have Standard Operation Procedure for Disaster. • Public safety and emergency contingency plans for effective response (all levels) are inadequate. • Promotion for other sector's activities such as water resources, transportation securement and food security as a priority is low.

3.2 Basic Principles

The DRRM Strategy is formulated in accordance with the fundamental and operational principles of the EAC. In addition, the Strategy is guided by the following principles and concepts:

- (i) In development of the strategy, it is understood that disaster risks result from the interaction between natural, technological or conflict induced hazards and vulnerability conditions. The EAC DRRM Strategy will focus on addressing both natural and human induced hazards/disasters.
- (ii) Since development is human centered and reducing disaster impacts involves regulating human actions that create the conditions in which disasters happen, disaster risk reduction should be seen as a development issue. In order to effectively build the resilience societies to disasters, it is required to accelerate efforts to pro-actively manage the growing disaster risks by integrating DRRM into all development issues. In this context, the DRRM is not stand-alone sector or programme and the DRRM sector is required to coordinate and collaborate with the other development sectors. The EAC DRRM Strategy will focus on effective DRRM activities through mainstreaming the DRRM in the development issues from every aspect, with three (3) principles of “Risk Literacy” (understanding of risk by all stakeholders), “Redundancy” (multidisciplinary approach) and “Kaizen” (continuous revising/improvement of capacity of society to cope with disaster). Required actions for mainstreaming DRRM in the development themes and sectors are summarized in Table 7 below:

Table 7 Actions for Mainstreaming DRRM in Development Themes and Sectors

Development Themes/Sectors	Actions for Mainstreaming DRRM
Poverty reduction including social protection issues to children, elders and disabled	<ul style="list-style-type: none"> • To identify constraints to adopting poverty risk assessment in development planning • Poverty profile at risks to understand the nature, incidence, severity and exposure of people to poverty and how poverty causes or worsens disaster risks • To analyze the living standards, main source of income, major consumption items, access to public services and quality, reliability and cost of services. • To analyze major disaster risk the poor face • To determine how poverty affects the onset, intensity, distribution of some types of hazards, particularly those of biological and environmental origin. • To identify strength, weakness, and the poor’s survival and coping strategies
Agriculture and rural development	<ul style="list-style-type: none"> • To assess natural hazards that affect agriculture and rural development • To assess effect of climate change on agriculture • To assess agriculture practice that affect environmental ad natural resources and their contribution to disaster • To assess how policies and programmes for agriculture and rural development take into account issues of hazards and disaster risks that negatively impact • To assess how agriculture infrastructure is resilient to disaster • To set measure to reduce risk to agriculture and rural development from disasters

Development Themes/Sectors	Actions for Mainstreaming DRRM
Environmental management	<ul style="list-style-type: none"> • To assess the factors that affect environmental change • To identify major environmental hazards and study the relationship between environmental factors and natural hazards • To establish impact of natural hazards to environment • To assess the factors that cause human vulnerability to environmental change • To assess the existing environmental policies, legislation, institution and standards and check their applicability in addressing the requirements for disaster risk reduction • To conduct Risk-based Environmental Impact assessment during development of environmental management intervention and during implementation review stage.
Water resources management	<ul style="list-style-type: none"> • To establish major types of water related hazards and their risk characteristics • To assess contribution of hydrological processes to human exposure and vulnerability • To assess the adequacy of water sector policies, legislation and institutional arrangement • To incorporate traditional and local methods of water risk management in water resources
Land use planning	<ul style="list-style-type: none"> • To use land use planning in identification of acceptable risks in disaster risk reduction interventions • To prepare risk maps and use them in land use planning • To assess existing policies, and legislation on land use planning and their applicability on disaster risk reduction • To strengthen institutional framework for development that promote a culture of risk reduction in land use planning
Infrastructure development	<ul style="list-style-type: none"> • To assess the susceptibility of various infrastructure systems to hazard event • To create awareness of major natural hazards that pose risk to infrastructure • To ensure high survivability of key and critical infrastructure • To establish/strengthen national infrastructure assurance programmes, including protection and emergency preparedness measures • To establish/strengthen national alert system for critical measure
Gender issues	<ul style="list-style-type: none"> • To place risk problems within the context of broader gender and development considerations • To conduct gender-based risk assessment at the appraisal stage of development and disaster reduction intervention • To establish relationship between gender and natural hazards pattern • To establish special requirements for women and girls during disaster response and recovery • To ensure gender balance in participation in all stages of the disaster risk reduction process
HIV/AIDS and other health issues	<ul style="list-style-type: none"> • To study the current incidence and prevalence of the diseases include its severity • To establish relationship between natural hazards and disease burden • To conduct training programmes and information system to enhance the capacity of individuals, communities and institutions to reduce the risk of epidemic disaster

Development Themes/Sectors	Actions for Mainstreaming DRRM
Climate change adaptation	<ul style="list-style-type: none"> • To assess extent, probability and effect of climate change-related damage and loss • To establish potential risk impact of climate change effects, based on scenarios of future climate change, population growth and other factors • To ensure Government implement development policy and budget processes that anticipate effects of climate change • To link National adaptation programmes network to international initiatives

- (iii) The EAC Partner States has limitations of financial resources for the DRRM activities. The EAC will promote the research activities for indigenous knowledge within the community and low cost measures in order to adopt and cope with disasters.
- (iv) Each individual EAC Partner State has limitations of resources for coping with the cross-border issues and large scale disasters by itself. Therefore, cooperation/collaboration and partnership among the Partner States are indispensable for such issues. The EAC DRRM Strategy will provide formulation of the cross-border cooperation/collaboration mechanism among the Partner States.
- (v) DRRM has implications for many sectors of the economy and society, meeting the challenge of the DRRM cannot be solely a Partner States Government’s initiative. Ensuring long-term sustainability against disasters will depend on the active participation of all stakeholders across the region, understanding the impacts of the disasters, taking timely action and preparing for future impacts. The EAC will pursue a collaborative approach by all relevant stakeholders including the Partner States governments, inter-governmental organizations, communities, the private sector, non-governmental organizations and development partners.
- (vi) During the first period of the EAC DRRM from 2012 to 2016, implementation of the DRRM activities shall be focused into the following activities in order to mainstream DRRM in development issues and to enhance the DRRM capacities of related institutions including communities:
 - Establishment of institutional and legal frameworks in the EAC and the Partner States including enhancement of capacities of institutions,
 - Disaster information management including identification of disaster risks in the EAC Sub-Region, and
 - Awareness creation for DRRM in the EAC Sub-Region including the research activities.

3.3 Vision, Mission and Objectives

Vision

To be a region of resilient communities in which natural and human induced hazards do not negatively impact on socio-economic development.

Mission

To facilitate sustainable integration of DRRM in development plans of EAC Partner States.

Objectives

The objectives of the EAC DRRM Strategy are:

- To provide framework for collaboration and partnership for the EAC Partner States in DRRM;
- To facilitate and strengthen the DRRM activities of the EAC Partner States in line with

the Hyogo Framework for Action (HFA) 2005-2015, the Africa Regional Strategy for DRR and those successor documents.

3.4 Strategies and Strategic Actions

The EAC DRRM Strategy is proposed on the basis of the results of the above SWOT analysis, the observations from the national consultative meetings in the Partner States and the basic principles above mentioned. The EAC DRRM Strategy comprises five (5) key priority areas adopted from HFA and associated strategies and strategic actions as follows:

HFA Key Priority Area 1:

Ensure that DRR is a national and a local priority with a strong institutional basis for implementation

Strategy 1.1: Provision of framework for collaboration and partnership for the EAC Partner States in DRRM;

Strategic action:

- * Establishment of a legal framework and an Implementation Programme for effective coordination of the EAC DRRM Strategy
- * Establishment of the EAC DRRM platform for coordination of the national platforms of partner states
- * Operationalization of a DRRM unit within the EAC Secretariat which will oversee funding mobilization and allocation of resources
- * Development of adequate human capacity for the EAC DRRM unit to manage the EAC DRRM Strategy
- * Development of sub-regional standard operating procedures for DRRM including memorandums and treaties for cross-border issues related to DRRM
- * Mainstreaming disaster issues in all sectors of the EAC Secretariat and the EAC Partner States to accelerate the EAC DRRM activities effectively

Strategy 1.2: Support of integration of the DRRM into the EAC Partner States National Development Policies, Plans and Programmes;

Strategic action:

- * Establishment of the EAC DRRM Fund for all of the activities of disaster risk management cycle
- * Mobilization of resources for assistance of DRRM programmes and projects for the Partner States
- * Harmonization of DRRM strategies of the Partner States, including promotion of community participation and identification of harmonized activities in DRRM in line with Climate Change Adaptation and Development Programs
- * Facilitating ratification of DRRM Policy, Strategy and other frameworks among the Partner States
- * Development of a regional multi-sectoral contingency plan, a response plan, a relocation/resettlement plan based on national and regional scales, considering trans-boundary problems and effects

- * Aligning institutional structure to accommodate DRRM and avoidance of duplication across sectors

Strategy 1.3: Development of DRRM capacity in the EAC Sub-Region

Strategic action:

- * Assessment and enhancement of capacity in finance, technology and human resources, and preparation of their inventory in the EAC Sub-Region
- * Development and implementation of a capacity development plan for the EAC Sub-Region
- * Assessment and adoption of local community indigenous and traditional knowledge on DRRM in the EAC Sub-Region

HFA Key Priority Area 2:

Identify, assess and monitor disaster risks and enhance early warning

Strategy 2.1: Provision of activities to identify, assess and monitor the disaster risks and enhance the early warning systems in the EAC Sub-Region

Strategic action:

- * Creation of the EAC Disaster Information Center and facilitation of establishment and strengthening the Disaster Information Centers in the EAC Partner States, which collect, store and share more accurate DRRM information in and around the EAC Sub-Region
- * Encouragement of enhancement of multi-sectoral early warning system in each Partner State with adequate lead time
- * Establishment of the EAC Information Database for DRRM, including disaster and risk profiles, detailed hazard profile maps, strategies, programmes, early warning systems, communication systems, lessons learned, good practices, and resources in the region; which is necessary support for the Partner States in developing DRRM activities.
- * Encouragement of enhancing proper communication systems in the Partner States concerning DRRM
- * Assessment of social and other sector impacts induced by disaster in development activities in the EAC Sub-Region
- * Assessment and assistance for promotion of ecosystem management (soil protection), urban and land planning in the EAC Sub-Region
- * Assessment of small scale hazards like inter-tribal conflicts, refugees, armed conflicts which cumulatively have significant impacts on the communities
- * Mobilization of resources in the EAC Sub-Region to the activities including experts, equipment and funds

Strategy 2.2: Monitoring and evaluation on the disaster risk in the EAC Sub-Region

Strategic action:

- * Preparation of monitoring and evaluation framework and guideline for the DRRM activities for the Partner States and EAC secretariat
- * Promotion of monitoring and evaluation on the DRRM for the EAC Sub-Region including urban and local communities considering KAIZEN (Continuous revising) in the JICA Three Principles Approach

HFA Key Priority Area 3:

Use knowledge, innovation and education to build a culture of safety and resilience at all levels

Strategy 3.1: Awareness creation on DRRM knowledge including indigenous and traditional knowledge and research promotion in DRRM Sector

Strategic action:

- * Establishment of a sub-regional DRRM Center of Excellence for research and training development
- * Establishment of a network of relevant stakeholders for information and experience sharing including website creation.
- * Promotion of traditional and indigenous knowledge within the community to adapt and cope with disaster
- * Promotion of use of modern technology in DRRM including application of space based technology

Strategy 3.2: Promotion of mainstreaming DRRM into public and school education curricula

Strategic action:

- * Establishment of education networks of DRRM in the EAC Sub-Region
- * Preparation and implementation of DRRM curricula, programmes and materials for education institutions
- * Promotion of extracurricular activities for DRRM, including use of mass media

HFA Key Priority Area 4:

Reduce the underlying risk factors

Strategy 4.1: Promotion of research activities of environmental and natural resources management, including activities related to identification of disaster prone areas, land use planning and human settlement (especially in enforcement of human settlement regulation) as key issues in building community resilience to disasters.

Strategic action:

- * Promotion of research and planning capacity
- * Enhancement of land use planning and human settlement capacity
- * Mobilization of resource for research activities

Strategy 4.2: Promotion of food security in the areas prone to disasters to enhance community resilience.

Strategic action:

- * Assessment of the areas prone to hazards in the EAC Sub-Region
- * Assistance of promotion of food security as well as feed security for livestock for the area prone to disasters

- * Promotion of stock piling, food strategic reserves and taking advantage of harvests

Strategy 4.3: Promotion of community based DRRM in the areas prone to disasters.

Strategic action:

- * Promotion, involvement and Partnership of the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent in Community based DRRM activities and creation of DRRM Champion (Models)
- * Consideration of gender and persons with special needs in response and preparedness
- * Promotion of new communication technology such as mobile phone, social media networks and radio especially in hazard early warning

Strategy 4.4: Promotion of the development of financial risk-sharing and risk transfer mechanism, particularly insurance and reinsurance against disasters.

Strategic action:

- * Research of financial risk sharing and risk transfer mechanism covering community peoples and their properties affected by disasters
- * Introduction of financial risk sharing and risk transfer policy with insurance against disaster, motivating insurance companies and people covered

Strategy 4.5: Promotion of Public Private Partnership

Strategic Action

- * Promotion of Corporate Social Responsibilities
- * Encouragement of corporates to use foundation's funds for DRRM activities

HFA Key Priority Area 5:

Strengthen disaster preparedness for effective response at all levels

Strategy 5.1: Interactive cooperation in search and rescue among the Partner States

Strategic action:

- * Development of evacuation plans during emergencies
- * Establishment of standardized search and rescue equipment like ambulance, etc.
- * Assistance for promotion for other sector's activities such as water resources, transportation securement and food security as a priority

Strategy 5.2: Assistance of establishment of the emergency funds in respective Partner States.

Strategic action:

- * Encouragement of establishment of the emergency funds for respective Partner States
- * Promotion of operationalization of the emergency funds for respective Partner States

Strategy 5.3: Promotion of cross-border cooperation mechanism for the emergency response and the cross-border issues.

Strategic action

- * Establishment of a cross-border cooperation mechanism and approved evidence, such as a memorandum among the EAC and the Partner States for creation of the rescue team

with the sub-regional nodes for emergency response including Standard Operation Procedures, etc.

- * Implementation of the cross-border cooperation mechanism among disaster related organizations and private sectors
- * Promotion of harmonized cross-border DRRM initiatives through joint planning and coordination among the EAC secretariat and the Partner States

Chapter 4: Implementation Plan

Implementation plan will address the institutional arrangement for cooperation and collaboration among the sectors, the financial arrangement, the implementation plan of the DRRM Strategy with indicative cost estimate during a period from 2012 to 2016, and monitoring and evaluation of the activities of the DRRM Strategy.

4.1 Institutional Arrangement

DRRM initiatives are currently undertaken in an uncoordinated manner by various departments, institutions and organizations at the sub-regional level and in the Partner States. There is need to have a defined coordination and management structure established to oversee the implementation of the Strategy and to enhance synergies and minimize duplication of efforts. The establishment of the implementation structure will be anchored on the EAC Protocol for Environment and Natural Resources Management. This will facilitate the creation of institutional arrangements at EAC level with clear linkages to the institutions in the Partner States and the EAC organs and institutions. A similar working relation with international entities will also be established.

Organization structures for implementation of the EAC DRRM Strategy are proposed as shown in **Figure 6**.

To ensure effective implementation of the strategy, two new institutions will be created within the EAC. These are as follows:

(1) Disaster Risk Reduction and Management Unit (DRRMU) in the EAC secretariat

The DRRMU in the EAC secretariat will be established as a secretariat of the EAC regional DRRM platform with the following manners:

- The DRRMU will be under the direct supervision of the Secretary General for effective coordination and rapid response during disaster emergencies
- DRRM is a tool for climate change adaptation. As such, the DRRMU will work closely with the Climate Change Coordination Unit (CCCU) on environmental, agriculture and food security programmes.
- The DRRMU will be linked to the existing Disaster Risk Reduction Unit under the directorate of political federation which was created under the protocol of peace and security with the objective of addressing regional peace and conflicts. There is need to harmonize the activities of the two units or merge them together
- Due to the cross-cutting nature of disasters risk reduction, the unit will have direct links to all the other directorates of the EAC Secretariat for the purposes of cross sectoral coordination and advisory on disaster management issues in order to mainstream DRRM in development activities.
- The Unit will also be linked to EAC specialized institutions specifically, the Inter-University Council and the Lake Victoria Basin Commission (LVBC)

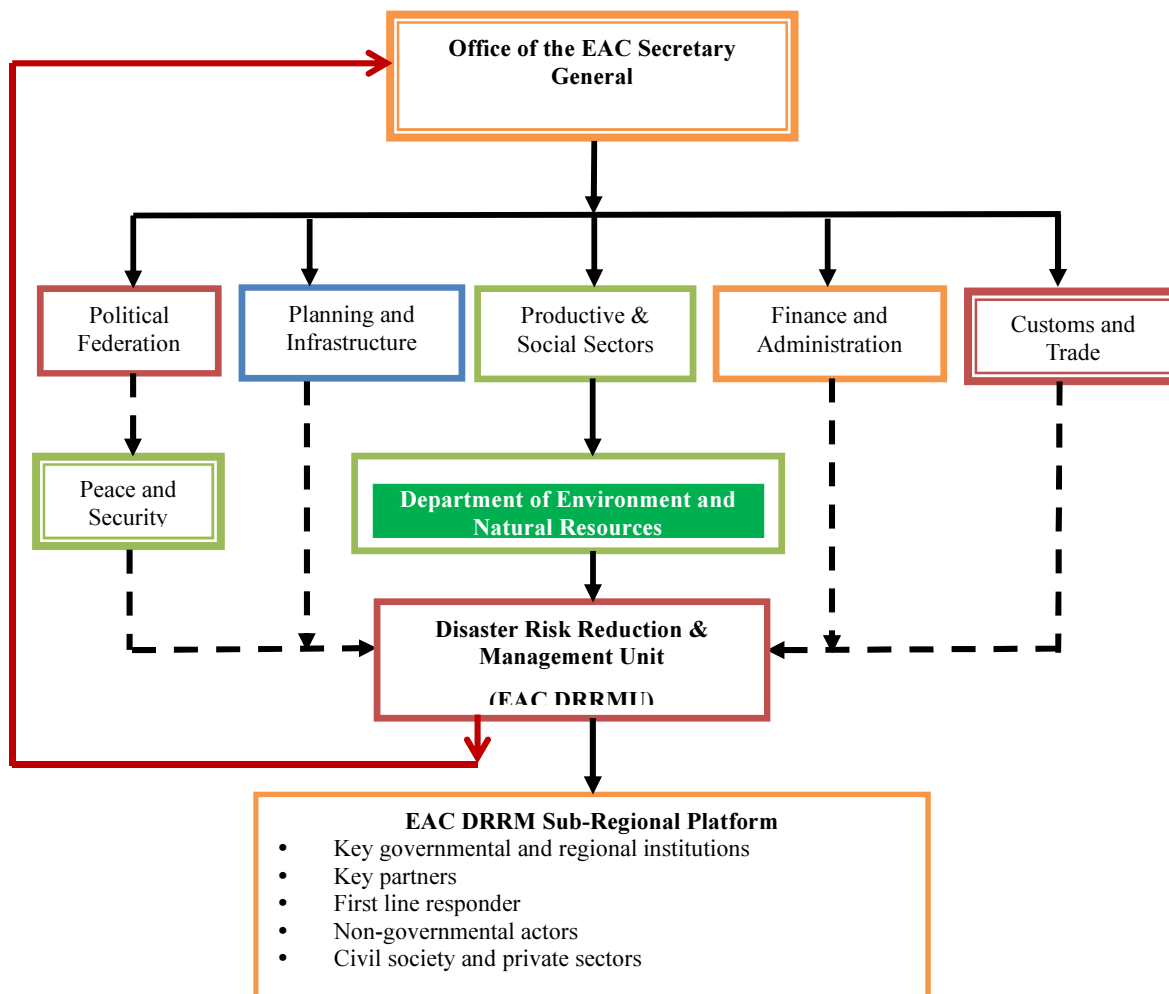


Figure 6 Organization Structures for Implementation EAC DRRM Strategy

(2) EAC DRRM Sub-Regional Platform

The platform will among other things play the major role in advocating and directing DRRM activities in the sub-region. The platform will be composed of National DRRM institutions in the Partner States, line Ministries, National NGOs, regional NGOs, the UN agencies country offices among other stakeholders.

Under the overall coordination and guidance of the EAC DRRMU, the sub-regional DRRM platform will among others undertake the following tasks:

- Creating information database for DRRM, including disaster and risk profiles, regional policies, strategies, capacities, resources and programmes; where necessary support Partner States in developing risk profiles;
- Identifying major challenges and opportunities in setting forth priority areas in addressing DRRM in the EAC Sub-Region;
- Liaising with the AUC and other partners on sub-regional DRRM assessment and reporting to the regional Africa DRRM forum;
- Benchmarking progress made in promoting DRRM and its mainstreaming into development policies, planning and programmes in each Partner State level and at sub-regional level;
- Developing result-oriented work plans of the Sub-Regional Platform for DRRM to coordinate the DRRM activities in line with the Africa Regional Strategy and the HFA;

- Coordinating joint efforts among stakeholders (National, private and sub-regional institutions) of the Sub-Regional Platform for DRRM to reduce the vulnerability of people at relatively high risk;
- Monitoring, recording and reporting of disaster risk reduction and management actions at sub-regional, national and community levels in line with the HFA;
- Documenting lessons learned and good practices, and share the findings (including promoting twinning of Sub-Regional Platforms for DRRM) at national, regional and international levels;
- Develop, promote Partner States capacity building and resource mobilization in DRRM activities; and
- Promote knowledge management and sharing including best practices.

In order to conduct the tasks thoroughly, periodical meetings for the EAC DRRM sub-regional platform will be instituted considering the national DRRM platforms meetings.

4.2 Financial Arrangement

The Strategy proposes a disaster management window under the EAC secretariat fund to provide core financial resources for implementing its programmes and activities. This fund will serve as a principal source of financing the Strategy and as a seed funding to attract donor support.

Other sources of financing the Strategy will include complementary co-financing of related areas, such as conflict monitoring, desertification, and, agriculture, and new funding from the Partner States, development partners and the private sector. Regarding major groups, the Strategy will encourage innovative approaches that allow citizen contribution to risk reduction services. These include participatory approaches that promote inter-group partnerships in implementing the Strategy at the national and community levels.

4.3 Implementation Plan

A period from 2012 to 2016 is the first period of the EAC DRRM. Therefore, implementation of the DRRM activities shall be focused into the following activities in order to mainstream DRRM in development and enhance the DRRM capacities of related institutions including communities:

- Establishment of institutional and legal frameworks in the EAC and the Partner States including enhancement of capacities of institutions,
- Disaster information management including identification of disaster risks in the EAC Sub-Region, and
- Awareness creation for DRRM in the EAC Sub-Region including the research activities.

Based on the above principle, the implementation plan of the Strategy is proposed as shown in **Table 8** below. Indicative cost estimate of the strategic actions and summaries of the proposed first-track projects to implement the Strategy are shown in **ANNEX 9** and **ANNEX 10**, respectively. Detailed implementation programme for the Strategy shall be developed at the initial stage of implementation as the Strategic Action (1) of the Strategy 1.1.

Table 8 Implementation Plan of the EAC DRRM Strategy

Strategy	Strategic Action	Estimated Cost (10 ³ USD) indicative	2012	2013	2014	2015	2016
HFA Key Priority Area 1: Governance and policy							
Strategy 1.1: Provision of an inter-governmental framework for collaboration and partnership for the EAC Partner States in DRRM	(1) Establishment of a legal framework and an Implementation Programme	13,268	■	■			
	(2) Establishment of EAC DRRM platform		■	■			
	(3) Operationalization of a DRRM unit within the EAC Secretariat				■	■	■
	(4) Development of adequate human capacity for EAC DRRM Unit				■	■	■
	(5) Development of regional standard operating procedures for DRRM				■	■	■
	(6) Mainstreaming disaster issues in all sectors of the EAC Secretariat and the EAC Partner States			■	■	■	■
Strategy 1.2: Support of integration of DRR into the EAC Partner States National Development Policies, Plans and Programmes;	(1) Establishment of the EAC DRRM Fund	-	■	■			
	(2) Mobilization of resources for assistance of DRRM programmes and projects for the EAC Partner States				■	■	■
	(3) Harmonization of DRRM strategies of the EAC Partner States				■	■	■
	(4) Encouragement of ratification of DRRM Policy and Strategy among the Partner states		■	■			
	(5) Development of a sub-regional multi-sectoral contingency plan, a response plan, a relocation/resettlement plan				■	■	■
	(6) Aligning institutional structure to accommodate DRRM and avoidance of duplication across sectors		■	■			
Strategy 1.3: Development of DRRM capacity in the EAC Sub-Region	(1) Assessment and enhancement of capacity in finance, technology and human resources, and preparation of their inventory	500	■	■			
	(2) Development and implementation of capacity development plan for EAC Sub-Region				■	■	■
	(3) Assessment and adaptation of local community traditional knowledge on DRRM				■	■	■

Strategy	Strategic Action	Estimated Cost (103USD) indicative	2012	2013	2014	2015	2016
HFA Key Priority Area 2: Risk identification and early warning							
Strategy 2.1: Provision of activities to identify, assess and monitor the disaster risks and enhance the early warning in the EAC Sub-Region	(1) Creation of the EAC Disaster Information Center and facilitation of establishing and strengthening the Disaster Information Centers in the EAC Partner States	4,128					
	(2) Encouragement of enhancement of multi-sectoral early warning system in each Partner State with adequate lead time						
	(3) Establishment of the EAC Information Database for DRRM						
	(4) Encouragement of enhancing proper communication system in the Partner States concerning DRRM						
	(5) Assessment of social and other sector impacts induced by disaster in development activities in the EAC Sub-Region						
	(6) Assessment and assistance for promotion of ecosystem management (soil protection), urban and land planning in the EAC Sub-Region						
	(7) Assessment of small scale hazards like inter-tribal conflicts, refugees, armed conflicts which cumulatively have significant impacts on the community						
	(8) Mobilization of resources in the EAC Sub-Region to the activities						
Strategy 2.2: Monitoring and evaluation on the disaster risk in the EAC Sub-Region	(1) Preparation of monitoring and evaluation framework and guideline for the DRRM activities for the Partner States and EAC secretariat	80					
	(2) Promotion of monitoring and evaluation on the DRRM for the EAC Sub-Region including urban and local communities						
HFA Key Priority Area 3: Use knowledge, innovation and education							
Strategy 3.1: Awareness creation on DRRM knowledge including traditional knowledge and research promotion in DRRM Sector	(1) Establishment of a sub-regional DRRM Center of Excellence;	170					
	(2) Establishment of network of relevant stakeholders for information and experience sharing						
	(3) Promotion of traditional and indigenous knowledge within the community to adapt and cope with disaster						

Strategy	Strategic Action	Estimated Cost (103USD) indicative	2012	2013	2014	2015	2016
	(4) Promotion of use of modern technology in DRRM including application of space based technology						
Strategy 3.2: Promotion of mainstreaming DRR into public and school education curricula	(1) Establishment of education networks of DRRM	340					
	(2) Preparation and implementation of DRRM curricula, programmes and materials for education institutions						
	(3) Promotion of extracurricular activities for DRRM, including use of mass media						
HFA Key Priority Area 4: Reducing the underlying risk factors							
Strategy 4.1: Promotion of research activities of environmental and natural resources management	(1) Promotion of research and planning capacity	-					
	(2) Enhancement of land use planning and human settlement capacity						
	(3) Mobilization of resource for research activities						
Strategy 4.2: Promotion of food security in the areas prone to disasters.	(1) Assessment of the areas prone to disasters	-					
	(2) Assistance of promotion of food security as well as feed security for livestock for the areas prone to disasters.						
	(3) Promotion of stock piling, food strategic reserves and taking advantage of harvests						
Strategy 4.3: Promotion of community based DRRM in the areas prone to disasters.	(1) Promotion, involvement and Partnership of the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent in Community based DRRM activities and creation of DRRM Champion (Models)	620					
	(2) Consideration of gender and persons with special needs in response and preparedness						
	(3) Promotion of new communication technology such as mobile phone, social media networks and radio especially in hazard early warning						
Strategy 4.4: Promotion of the development of financial risk-sharing	(1) Research of financial risk sharing and risk transfer mechanism covering community peoples and their properties affected by disasters	80					

Strategy	Strategic Action	Estimated Cost (103USD) indicative	2012	2013	2014	2015	2016
and risk transfer mechanism, particularly insurance and reinsurance against disasters	(2) Introduction of financial risk sharing and risk transfer policy with insurance against disaster motivating insurance companies and people covered						
Strategy 4.5: Promotion of Public Private Partnership	(1) Promotion of Corporate Social Responsibilities	-					
	(2) Encouragement of corporates to use foundation's funds for DRRM activities						
HFA Key Priority Area 5: Strengthen disaster preparedness for effective response							
Strategy 5.1: Interactive cooperation in search and rescue among partner states	(1) Development of evacuation plans during emergencies	120					
	(2) Establishment of standardized search and rescue equipment like ambulance, etc.						
	(3) Assistance for promotion for other sector's activities such as water resources, transportation securement and food security as a priority						
Strategy 5.2: Assistance of establishment of the emergency funds in respective partner states.	(1) Encouragement of establishment of the emergency funds for the Partner States	50					
	(2) Promotion of operationalization of emergency funds for the Partner States						
Strategy 5.3: Promotion of cross-border cooperation mechanism for the emergency response and the cross-border issues.	(1) Establishment of the cross-border cooperation mechanism and approved evidence						
	(2) Implementation of the cross-border cooperation mechanism						
	(3) Promotion of harmonized cross border DRR initiatives through joint planning and coordination among the EAC secretariat and the partner states						

4.4 Monitoring and Evaluation

The DRRM activities are multi-sectoral activities and various institutional actors have key roles to implement the EAC DRRM Strategy. Therefore, it is indispensable to monitor, evaluate and review the DRRM activities periodically, in order to harmonize various activities of DRRM, increase the risk literacy of the stakeholders and ensure the redundancies of the countermeasures against hazards.

A monitoring and evaluation framework shall be developed as an integral component to ensure the objectives are achieved and strategic actions implemented in a cost effective, coordinated and harmonized approach in the Sub-Region. The EAC Secretariat and the EAC DRRM sub-regional platform will develop a robust monitoring and evaluation framework

and guideline with clear milestones and indicators for the Strategy at the sub-regional level. The EAC shall be responsible for tracking, coordinating and overseeing the implementation of the DRRM programmes in collaboration with the Partner States. Monitoring and evaluation of the national projects will be the responsibility of the Partner States. The monitoring plan will ensure collection of information for use by coordinating institutions and key stakeholders to measure progress of implementation of the activities and facilitate timely decision making. An explicit monitoring and evaluation framework and guideline will be developed at the early stage of implementation of the Strategy, in line with the Strategy 2.2 “Monitoring and evaluation on the disaster risk in the EAC Sub-Region”.

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ANNEX 1: Priority Areas of Hyogo Framework for Action (HFA)

Priority Area 1 Governance and policy: *To ensure that DRR is a national and local priority with strong institutional basis for implementation through;*

- i) Institutional mechanisms: strengthen or establish National DRR Platforms,
- ii) Legal frameworks considering compatibility to existing ones,
- iii) Integrate DRR into national plans as part of national planning process.

Priority Area 2 Risk identification and Early Warning: *To identify, assess and monitor disaster risks and enhance Early Warning (EW) through;*

- i) Multi-hazard identification, mapping and monitoring system,
- ii) Vulnerability assessment, mapping and indicators,
- iii) Scientific and technological development,
- iv) Data and statistical analysis,
- v) Monitoring and Early Warning Systems (EWS) and effective communication capacities.

Priority Area 3 Use knowledge, innovation and education: *To build a culture of safety and resilience at all levels through;*

- i) Capacity development: training and learning on DRR: national, local levels,
- ii) Information sharing and cooperation,
- iii) Knowledge networks and management,
- iv) Awareness and education campaigns,
- v) Communication strategy and Media promotion.

Priority Area 4 Reducing the underlying risk factors: *On environment, Climate Change, food security, gender, financial risk-sharing mechanism and land-use planning through;*

- i) Enforcement of rules and procedures,
- ii) Adopting to Climate Change adaptation measures,
- iii) Raising strategic grain reserves,
- iv) Application of weather index insurance financing to farmers,
- v) Conformance to building codes etc.

Priority Area 5 Strengthen disaster preparedness for effective response: *Guidelines and Indicators package through;*

- i) Coordination and cooperation in a holistic approach,
- ii) Preparedness planning and Contingency Planning,
- iii) Elements for emergency preparedness for effective response.

ANNEX 2: Disaster Records of the EAC Partner States

Natural Disasters in the Past 22 years (1978~2009) in Burundi

Year	Type of Disaster	No. Killed	No. Affected People	Economic Loss (x1000)
1978	Epidemic	54	1530	-
1989	Flood	12	3,600	-
1992	Epidemic	220	2,068	-
1997	Epidemic	21	23,889	-
1999	Epidemic	51	616,034	-
1999	Storm	-	30,810	-
1999	Drought	6	650,000	-
1999	Epidemic	29	400	-
2000	Epidemic	308	722,591	-
2002	Epidemic	13	781	-
2002	Epidemic	68	934	-
2004	Storm	-	15,000	-
2004	Earthquake	3	120	-
2005	Drought	120	2,150,000	-
2007	Flood	4	23,000	-
2008	Drought	-	82,500	-
2009	Drought	-	180,000	-

(Source: Web site of EM-DAT)

Natural Disasters in the Past 19 years (1980~2008) in Kenya

Year	Type of Disaster	No. Killed	No. Affected People	Economic Loss (x1000)
1991	Drought		2,700,000	
1994	Epidemic	1,000	6,500,000	
1994	Drought		1,200,000	
1997	Drought		1,600,000	
1997	Flood	86	900,000	\$ 11,800
1997	Epidemic	555	17,200	
1997	Epidemic	300		
1997	Epidemic	237	13,500	
1997	Epidemic	140	2,400	
1999	Drought	85	23,000,000	
1999	Epidemic	1,237	22,400	
1999	Epidemic	563	306,400	
2001	Flood	4		\$38
2004	Drought	80	2,300,000	
2004	Earthquake (Tsunami)	1		\$ 100,000
2005	Drought	27	3,500,000	
2005	Flood	1	25,000	\$ 500
2006	Flood	114	723,000	
2006	Epidemic	155	529	
2008	Drought	4	3,800,000	

(Source: Web site of EM-DAT)

- The total economic loss of 1997/1998 flood is estimated to be USD 1 Billion by Worldbank * 29

Natural Disasters in the Past 39 years (1974~2012) in Rwanda

Year	Type of Disaster	No. Killed	No. Affected	Economic Loss (x1000)
1974	Flood	-	1,900,000	
1976	Drought	-	1,700,000	
1984	Drought	-	420,000	
1988	Flood	48	21,678	
1989	Drought	237	60,000	
1991	Epidemic	32	214	
1996	Drought	-	82,000	
1998	Epidemic	55	2,951	
1999	Epidemic	44	29	
1999	Drought	-	894,545	
2002	Earthquake	45	1,643	
2002	Flood	69	20,000	
2002	Epidemic	83	636	
2003	Drought	-	1,000,000	
2006	Epidemic	35	300	
2006	Landslide	24	2000	
2007	Flood	10	500	\$ 9
2008	Earthquake	36	643	
2008	Flood	-	11,346	
2010	Landslide	14	5,937	

(Source: Web site of EM-DAT)

Natural Disasters in the Past 19 years (1980~2008) in Tanzania

Year	Type of Disaster	No. Killed	No. Affected People	Economic Loss (x1000)
1980	Epidemic	12		
1982	Flood		40,000*a	
1983	Epidemic	163		
1984	Drought		3,000,000	
1985	Epidemic	10	118	
1986	Flood		6,000*b	
1987	Epidemic	90	500	
1988	Drought		110,000	
1989	Flood	10	141,000	
1990	Flood	183	162,000*c	\$ 280
1990	Epidemic	200		
1991	Drought		800,000	
1991	Epidemic	290		
1991	Epidemic	284	1,733	
1993	Flood	54	202,000	\$ 3,510
1996	Drought		3,000,000	
1997	Epidemic	2,025	35,600	
1997	Epidemic	304	6,800	
1998	Epidemic	1,871	35,800	

Year	Type of Disaster	No. Killed	No. Affected People	Economic Loss (x1000)
1998	Epidemic	590	4,900	
2003	Drought		1,900,000	
2004	Drought		254,000	
2007	Epidemic	109	264	

(Source: Web site of EM-DAT)

Different data were submitted by Disaster Management Department Tanzania as follows

*a = 4,000, *b = 1,500, *c = 142,00

Natural Disasters in the Past 111 years (1901~2011) in Uganda

Year	Type of Disaster	No. Killed	No. Affected People	Economic Loss (x1000)
1901	Epidemic	200,000	-	-
1935	Epidemic	2,000	-	\$ 50
1966	Earthquake	104	5,510	1,500
1967	Drought	-	25,000	\$ 200
1979	Drought	-	500,000	-
1987	Drought	-	600,000	-
1989	Drought	156	961	-
1990	Epidemic	197	1170	-
1991	Epidemic	100	-	-
1994	Earthquake	7	50,000	70,000
1997	Flood	100	153,500	1,000
1998	Drought	-	126,000	1,600
1999	Drought	115	700,000	-
2000	Epidemic	224	423	-
2002	Drought	79	655,000	-
2005	Drought	-	600,000	-
2007	Flood	29	718,045	\$ 71
2008	Drought	-	1,100,000	-
2010	Landslide	388	12,795	-
2011	Drought	-	669,000-	-

(Source: Web site of EM-DAT)

ANNEX 3: National Policies, Strategies, Plans and Acts of the EAC Partner State

TYPE	Burundi	Kenya	Rwanda	Tanzania	Uganda
National Policy / Strategy / Plan for DRR	<p>-Politique Nationale de Prévention des Risques et de Gestion des Catastrophes (National Policy for Risk Prevention and Disaster Management)</p> <p>-Stratégie Nationale de Prévention des Risques et de Gestion des Catastrophes et un Plan d'Action 2012-2015 (National Strategy for Risk Prevention and Disaster Management and Action Plan 2012-2015)</p>	<p>-National Policy for Disaster Management in Kenya (Draft, Feb. 2011)</p> <p>-Disaster Risk Reduction Strategy</p> <p>-National Disaster Management Strategic Plan 2012-2017 (Draft, Apr. 2012)</p> <p>-National Disaster Response Plan</p>	<p>-National Policy on Disaster Risk Reduction and Prevention in Rwanda(2009)</p> <p>-National Disaster Management Policy (Draft, Jun. 2012)</p> <p>-The Strategic Plan of Action of the National Policy on Disaster Management</p> <p>-MIDIMAR 5 Year Strategic Plan</p> <p>-National Contingency Plan</p> <p>-National Disaster Risk Management Plan</p> <p>-Disaster Recovery Plan (under developing)</p>	<p>-National Disaster Management Policy 2004</p> <p>-National Disaster Management Policy (Draft)</p> <p>-National Emergency Preparedness and Response Plan (preparation)</p>	<p>-National Disaster Preparedness Policy and Institutional Framework (1999 approved, 2003 revised)</p> <p>-The National Policy for Disaster Preparedness and Management (2010)</p>
Legislation / Guideline		<p>-Water Resources Management Act</p> <p>-National Environmental Management Act</p> <p>-Land Act No.6 of 2012</p>		<p>-The Disaster Relief Act No.9 of 1990</p> <p>-National Operational Guidelines for Disaster Management (2003)</p> <p>-Environmental Management</p>	<p>-National Disaster Preparedness and Management Act (Proposed)</p> <p>-National Disaster Preparedness and Management Fund Bill</p>

		<ul style="list-style-type: none"> -National Land Commission Act No.5 of 2012 -Land Registration Act No.3 of 2012 		<ul style="list-style-type: none"> Act of 2004 -The Village Act No.5 of 1999 -Land Use Planning Act No.6 of 2007 	<ul style="list-style-type: none"> (Proposed) -Town and Country Planning Act (1964) -National Environment Act, Cap. 153 -Public Health Act -Water Act (2003) -Forests Act (2003) -National Drug Policy and Authority Act The Water Act, Cap. 152. The Water Resources Regulations, No. 33/1998.
<p>National Policy / Strategy / Plan for CCA, Land Use and so on</p>	<ul style="list-style-type: none"> -Cadre Stratégique de Lutte contre la Pauvreté, Cadre Stratégique pour la Consolidation de la Paix, Burundi Horizon 2025 (Strategic Framework for the Fight against Poverty, Strategic Framework for Peacebuilding, Burundi Horizon 	<ul style="list-style-type: none"> -National Policy for Resettlement of Internally Displaced Persons (Draft) -National Environmental Management Policy -Fire Safety Policy of Kenya -National Land Policy (May 2007) -Policy for the Sustainable Development of the Arid 	<ul style="list-style-type: none"> -The Vision 2020 Umurenge Program (VUP) -Climate Change Adaption strategy -National Land Use and Development Master Plan -Sectorial Policy on Water and Sanitation (2004) -Environment Policy -Environment Sub-Sector 	<ul style="list-style-type: none"> -National Land Policy (1995) -National Land Use Framework Plan 2008-2028 -National Human Settlements Development Policy (2000) -Environmental Management Policy -National Avian Influenza Strategic Plan 	<ul style="list-style-type: none"> -Water and Sanitation Sector SECTORAL SPECIFIC SCHEDULE S / GUIDELINES 2009/10 Final -National Water Policy -Water and Sanitation Sub-sector Gender Strategy (2010-15)

	2025)	<p>and Semi-Arid Lands</p> <p>-Arid Land Resource Management Plan II</p> <p>-Kenya National Strategic Plan for HIV and AIDS Management</p> <p>-National Climate Change Response Strategy (2010)</p> <p>-STRATEGIC PLAN 2008-2012</p>	<p>Strategic Plan 2010-2015</p> <p>-National Adaptation Programmes of Action to Climate Change NAPA-RWAN DA (2006)</p> <p>-National Land Policy (2004)</p> <p>-Five-year Strategic Plan for the Environment and Natural Resources Sector (2009-2013)</p>	<p>-National Water Sector Development Strategy</p> <p>-National Water Policy</p> <p>-Ministry of East African Cooperation EAC</p> <p>Medium Term Strategic Plan: 2010/11 – 2012/2013</p>	
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ANNEX 4: DRM Organizations Based on New DRM Policies of the EAC Partner States *14, *15, *27, *30, *33

TITLE	Burundi	Kenya	Rwanda	Tanzania	Uganda
Disaster Prevention Organizations	-Direction Générale de la Protection Civile -Ministère de la Sécurité Publique (Head office of Civil protection, Ministry of Public Safety)	-Ministry Responsible for Disaster Management (MRDM)	-Ministry of Disaster Management and Refugee Affairs (MIDIMAR)	-Prime Minister's Office (PMO) -Disaster Management Department (DMD)	-Department of Relief, Disaster Preparedness and Management -Directorate of Relief, Disaster Preparedness, Management and Refugees -Office of the Prime Minister
Coordination in Emergency situation	-Un Centre National d'Opérations d'Urgences (Planned) (National Center for Emergency Operations)	-National Disaster Operation Center (NDOC)	-MIDIMAR	-National Emergency Operation Center (under consideration)	-National Emergency Coordination and Operation Centre (NECOC)
Highest Committee	-Commission Interministérielle de Gestion des Risques et des Catastrophes (Inter-ministerial Committee Risk Management and Disaster)	-National Executive (NE)	-National Disaster Management Executive Committee, (NDMEC)	-National Disaster Management committee (NADMAC)	-Inter Ministerial Policy Committee

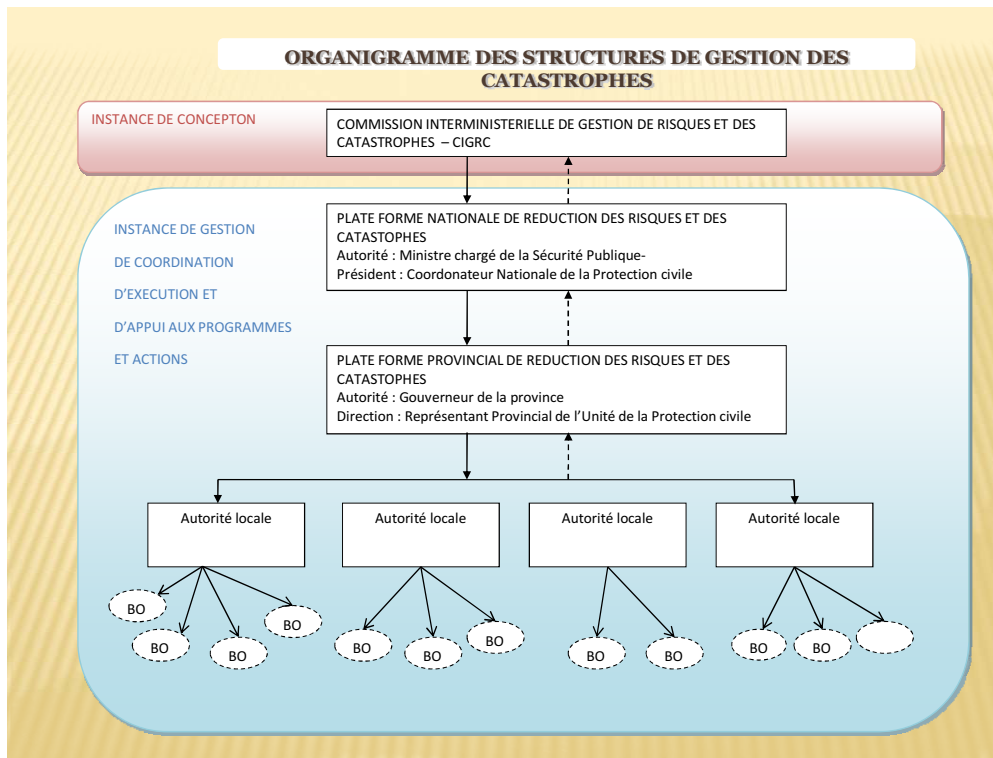
<p>Committees</p> <p>National Platform</p>	<p>-Plate Forme Nationale de Reduction des Risques et des Catastrophes (The Platform of National Risk Prevention and Disaster Management)</p>	<p>-National Disaster Coordination Committee (NDCC)</p> <p>-National Platform for Disaster Risk Reduction (NPDRR)</p> <p>-National Disaster Coordinating Committee</p>	<p>-National Disaster Management Technical Committee (NDMTC)</p> <p>-National Platform for Disaster Risk Reduction (NPDRR)</p> <p>-MIDIMAR /UN Joint Intervention Management Committee (JIMC)</p> <p>-Disaster Management Task Force (DMTF)</p> <p>-Sector Disaster Management Committee</p>	<p>-Disaster Management Committee</p>	<p>-National Disaster Preparedness and Management Commission</p> <p>-National Platform for Disaster Management, Inter-Agency Technical Committee</p>
<p>Flood</p>	<p>-Ministère des Travaux Publics et de l'Équipement (Ministry of Public Works and Equipment)</p>	<p>-MRDM</p>	<p>-Ministry of Local Government</p>	<p>-Ministry of Water</p>	<p>-Ministry of Water and Environment</p>

Drought	-Ministry of Water, Environment, Land Use Plan and Urban Development (Ministère de l'Eau, de l'Environnement, de l'Aménagement du Territoire et de l'Urbanisme)	-Ministry Responsible Development of Northern Kenya and Other Arid and Semi Arid Lands	-Ministry of Agriculture and Animal Resources	-Ministry of Agriculture	-Ministry of Water and Environment
Early Warning System	-Ministère de l'Agriculture et de l'Élevage (Ministry of Agriculture and Animal Husbandry) -Institut Géographique du Burundi (Geographical Institute of Burundi, IGEBU)		-National Meteorological Service of Rwanda	-Tanzania Meteorological Agency (TMA) -Ministry of Energy and Minerals -Seismology Unit -Emergence Preparedness and Response Unit, ERPU -Food Security Department	-Department of Disaster Preparedness and Refugees -Department of Meteorology -Ministry of Agriculture -Ministry of Health -Ministry of Water and Environment

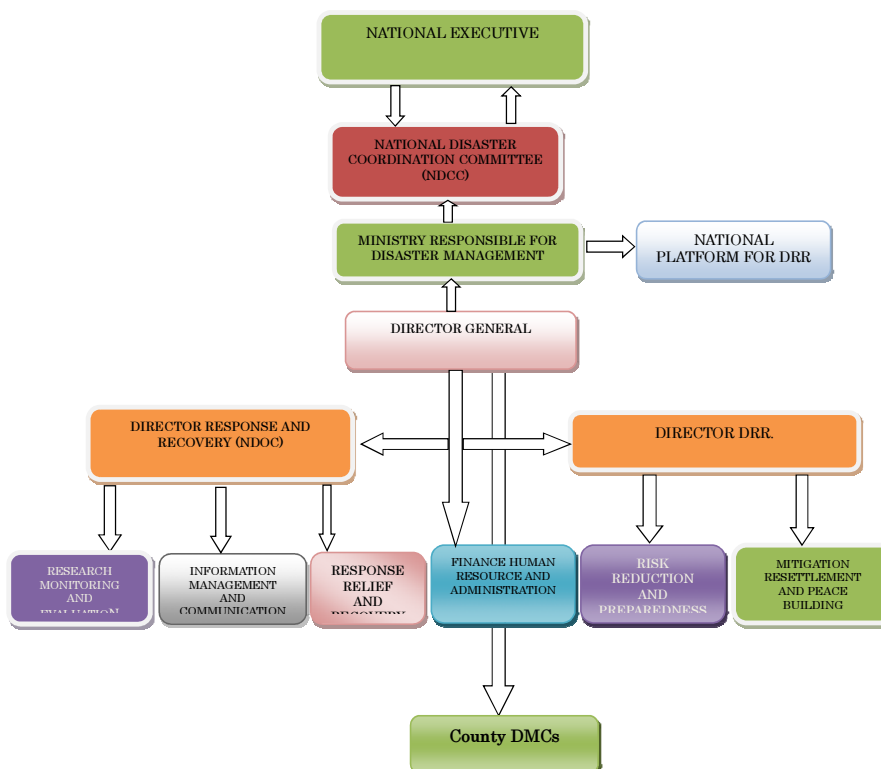
Land Use Planning	-Ministry of Water, Environment, Land Use Plan and Urban Development (Ministère de l'Eau, de l'Environnement, de l'Aménagement du Territoire et de l'Urbanisme)		-Ministry of Natural Resources (MINIRENA)	-Ministry of Lands, Housing and Human Settlements Development	
Other Related Organizations		-Ministry of Planning and national Development -Ministry of Health -Ministry of Water -Ministry of Agriculture -Ministry Responsible for Internal Security (MRIS)		-Ministry of Agriculture -National Food Security Team -Fire and Rescue Department	-National Environment Management Authority -Ministry of Energy and Mineral Development

Local organizations		-County Disaster Management Committee (CDMC) -Constituency / District Disaster Management Committee	-District Disaster Management Committee -Sector Disaster Management Committee	-Regional Disaster Management Committee (REDMAC) -District Management Committee (DIDMAC) -Village Disaster Management Committee (VIDMAC)	-District / City disaster Policy Committee (DDPC/CDPC) -District / City Disaster Management Technical Committee (DDMTC/CDMTS) -Municipal / Town disaster Policy Committee -Municipal / Town Disaster Management Technical Committee -Sub-Country / Village Disaster management Committee (SDMC/ VDMC) -District Emergency Coordination and Operations Centre (DECOC)
Climate Change		-Ministry of Environment and Mineral Resources	-Rwanda Environment Management Authority (REMA)		-Department of Meteorology

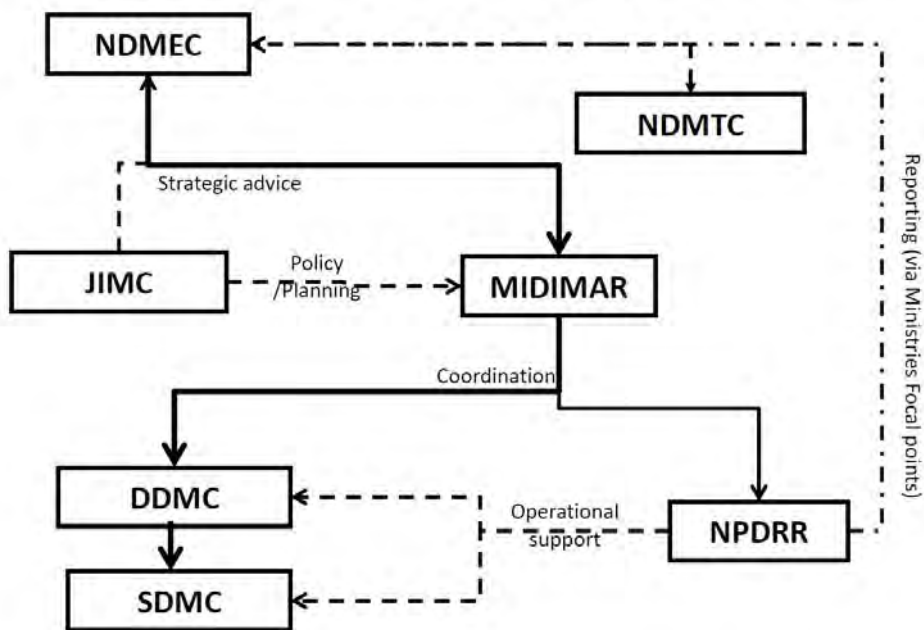
ANNEX 5: Institutional Frameworks on DRM based on New DRM Policies of the Partner States



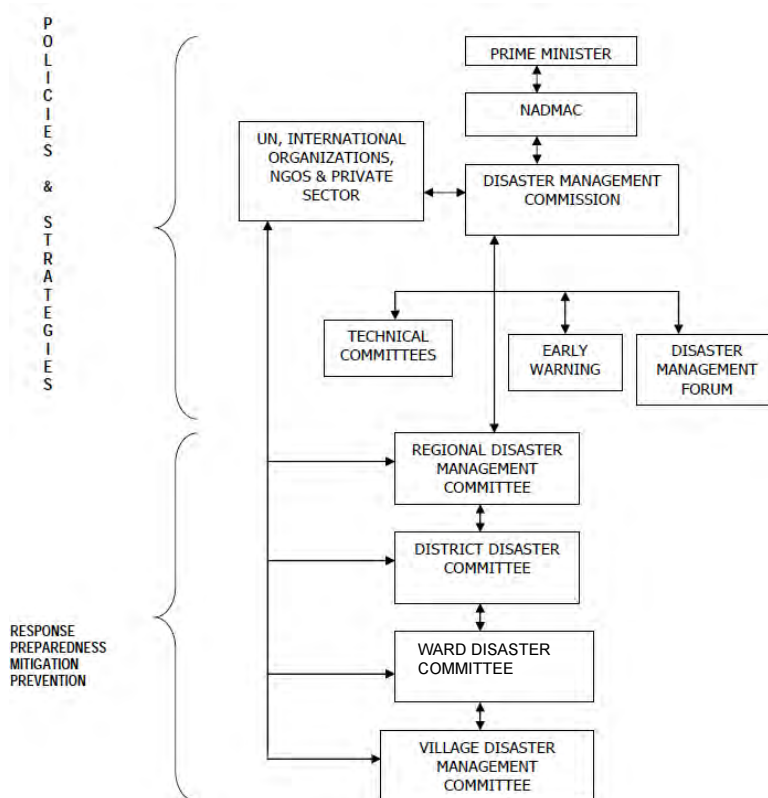
National institutional framework in Burundi. ^{*14}



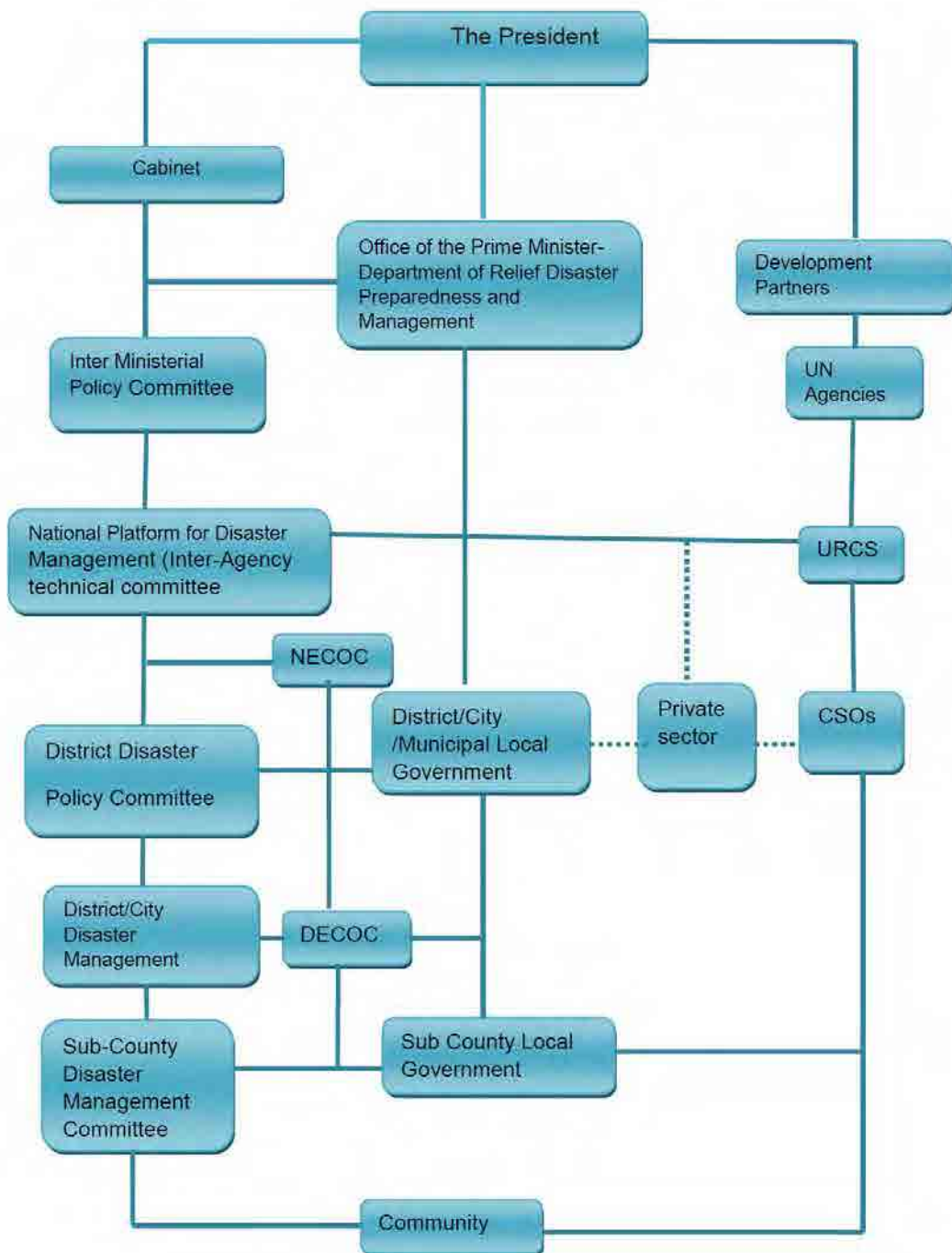
Overarching structure of disaster management bodies in Kenya. ^{*15}



Institutional framework for disaster management in Rwanda. *27



Proposed disaster management institutional structure in Tanzania. *30



Institutional structure of national disaster preparedness and management in Uganda. ^{*32}

ANNEX 6: Information Flows for EWSs/Responsible Organizations

Country	Sector	Content of early warning	Early warning delivery method	Organization responsible
Burundi	Food security	-Seasonal weather information ^{*13} -Food storage and post harvest handling	-Media	-Ministry of Water, Environment, Land Management and Urban Planning, Agriculture, Livestock
	Drought	-Weather forecast	-Media	-Ministry of Water, Environment, land Management and Urban Planning
	Floods	-Seasonal weather information ^{*13}	-Media	-Ministry of Water, Environment, Land Management and Urban Planning -Meteorology Department (MET Dept.)
	Rainfall	-Seasonal weather information ^{*13}	-Media	-Ministry of Water, Environment, Land Management and Urban Planning -MET Dept.
	Landslide	-Seasonal weather information ^{*13}	-Media	-Ministry of Water, Environment, Land Management and Urban Planning -MET Dept. -Mines and Geological Department
	Epidemics	-Surveillance, trends,	-Media -Government structures -Religious institutions	-Ministry of Health -National Institute for Nature Conservation and the Environment (INCE) -Ministry of Agriculture and Livestock
	Environment			-National Institute for Environment

Country	Sector	Content of early warning	Early warning delivery method	Organization responsible
				Management
Kenya	Food security	-Weather information *13 -Food Storage and post-harvest handling	-Government spokesperson -Government structures -Religious institutions -Media	-Ministry of Agriculture -Ministry of Special Programme -Food Security steering group -MET Dept. -DRSRS -Ministry of Livestock Development -Ministry of Water and Irrigation
	Drought	-Seasonal weather information	-Media -Government spokesperson -Government structures -Religious institutions	-Ministry of North Kenya and Arid Lands -Ministry of State for Special Program -Ministry of Water -Ministry of Livestock -Ministry of Agriculture -MET Dept.
	Floods	-Seasonal weather information *13	-Media -Government spokesperson -Government structures -Religious institutions	-Ministry of State for Special Program -Ministry of Water -MET Dept.
	Rainfall	-Seasonal weather information *13	-Media -Government spokesperson -Government structures	-Meteorology and Agriculture -Ministry of Agriculture and Food Security through Early

Country	Sector	Content of early warning	Early warning delivery method	Organization responsible
			-Religious institutions	Warning Unit -MET Dept.
	Landslide	-Seasonal weather information *13	-Media	-Mines and Geology Dept.
	Epidemics	-Surveillance, trends,	-Media -Government structures -Religious institutions -Press releases	-Ministry of Public Health -Ministry of Livestock Development
	Environment	-Surveillance, trends,	-Media -Government structures,	- Natural Environmental Management Authority (NEMA)
Rwanda	Food security	-Regular report of food trend and price -Seasonal weather information *13, -Food Storage and post harvest handling	-Media	-Ministry of Agriculture and Livestock -FEWSNET
	Drought	-Weather information	-Media -Email to concerned Ministries	-Ministry of Agriculture and Livestock
	Floods	-Hydrological trends -Seasonal weather information *13	-Media -Email to concerned Ministries	- Rwanda Environment Management Authority (Water Department), REMA MET Dept. (UNDP/ UNEP)
	Rainfall	-Weather forecast in 24 hours basis	-Media	-Meteorological Department in the Ministry of

Country	Sector	Content of early warning	Early warning delivery method	Organization responsible
				Infrastructure -Rwanda Meteorological Center
	Landslide	-Weather information *13	-Media	-REMA (Rwanda Natural Resources Authority) -RNRA (Mines and Geology Department)
	Epidemics	-Surveillance, trends,	-Media -Government structures -Religious institutions	-Rwanda Biomedical Center under Ministry of Health (RBC)
	Environment	-Environmental protection	-Media	-REMA --MINIRENA
Tanzania	Food security	-Crop Performance, food shortage, and food prices	-Media -Government structures	-Early Warning Unit Ministry of Agriculture and Food Security (both in Mainland and Zanzibar) -FEWSNET
	Drought	-Weather forecast	-Media	-TMA -Ministry of Agriculture and Food Security (Plant Protection Unit)
	Floods	-Seasonal weather information *13	-Media	-TMA - Ministry of Water (Dam Safety and Flood Control Unit)
	Rainfall	-Seasonal weather information *13	-Media	-TMA
	Landslide	-Surveillance, trends,	Media	-Ministry of Mineral and Energy -Geophysical

Country	Sector	Content of early warning	Early warning delivery method	Organization responsible
				Survey of Tanzania -NEMC
	Epidemics	-Surveillance, trends,	-Media -Government structures -Religious institutions	-Ministry of Health and Social Welfare (EPR Unit) -Ministry of Livestock Development and Fisheries
	Environment	-Environmental protection	-Media -Government structures	-NEMC -Vice President's Office Division of Environment for Mainland - First Vice President Office, Environment Department for Zanzibar
Uganda	Food security	-Seasonal weather information ^{*13,} -Food Storage and post harvest handling -Food market information	-Media -Government structures -Religious institutions	-Ministry of Agriculture, Animal Industry and Fisheries, Food and Agricultural Organization -FEWSNET (Foreign Agricultural Service: FAS) - Department of Metrology
	Drought	-Seasonal weather information and advicesorry messages	-Media, -Government structures -Religious institutions	-Ministries of Water and Environment -Ministry of Agriculture, Animal Industry and Fisheries -Agency for Technical Cooperation and

Country	Sector	Content of early warning	Early warning delivery method	Organization responsible
				Development (ACTED) -Meteorology Department (MET Dept.)
	Floods	-Daily weather patterns and trends -Seasonal weather information *13	-Media -Government structures -Religious institutions	-Ministry of Water and Environment -MET Dept.
	Rainfall	-Seasonal weather information *13	-Media -Government structures -Religious institutions	-Ministry of Water, Environment -MET Dept.
	Landslide	-Seasonal weather information and advicesorry information	-Media, -Government structures -Religious institutions	-Ministry of Water, Environment, Land Management and Urban Planning - NEMA -Ministry of Land Housing and Urban Planning
	Epidemics	-Surveillance, trends, and spread of diseases	-Media -Government structures -Religious institutions	-Ministry of Health -Ministry of Agriculture, Animal Industry and Fisheries World Health Organization (WHO)
	Environment	-Environmental degradation and pollution	-Media -Government structures, -Religious institutions	- NEMA

ANNEX 7: International Programmes in the EAC countries

*10,*13,*14,*15,*16,*17

Type of Programm	Burundi	Kenya	Rwanda	Tanzania	Uganda
< World Bank / GFDRR >					
Climate modeling and risk management Project	✓	✓	✓	✓	✓
Disaster risk management in Africa - strategic framework, good practice, communication		✓	✓		
Disaster Risk Management in the Sub-Saharan Africa Region		✓			
Enhancing the Capacity in Disaster Risk Reduction of Bank TTLs in ARD Africa		✓	✓		
Feasibility Study for Pan African Drought Risk Pool		✓			
Horn of Africa Drought Response		✓			✓
South-South Cooperation ? Strengthening ICPAC as a regional centre of excellence for disaster risk reduction	✓	✓	✓	✓	✓
Capacity Building for Disaster Resilient Leadership		✓	✓	✓	✓
(SSCP) Regional Risk Reduction and Sustainable Development (IGAD)	✓		✓	✓	✓
Uganda: Capacity Building in Damage and Loss Assessment					✓
Uganda: Round-2 Capacity Building in Damage and Loss Assessment					✓
Asia Leadership Development in Disaster Risk Management	✓				
< UNDP >					
Northern Uganda Drought Support		✓			✓
Floods Emergency Project; Formation of water and sanitation coordination teams in the various regions		✓			
Disaster Risk Management in Tanzania. Strengthen capacity in DRM within the Government				✓	
Reinforcement of national capacities on prevention and risk management	✓				
Reducing Vulnerability to Climate Change by Establishing Early Warning and Disaster Preparedness Systems and Support for Integrated Watershed Management in Flood Prone Areas			✓		
Mainstreaming Climate Change Adaptation into National Policies in Tanzania (2010-2011)				✓	
Workshops and field trips for information and sensitization campaigns	✓				
< UNISDR >					
Strengthening National Platforms for Disaster Risk Reduction in Africa	✓	✓		✓	✓*
< UNOCHA >					
Drafting and review of National Disaster Response Plan; District Disaster Preparedness and Response planning ; Contingency Planning for Flood Management		✓			

Type of Programm	Burundi	Kenya	Rwanda	Tanzania	Uganda
Strengthening capacity for DRR in the Francophone and Lusophone African countries in line with the HFA priorities in cooperation with the AUC			✓		
< WMO >					
Strategy for Flood management		✓			
Climate observations and regional modeling in support of climate risk management	✓	✓	✓	✓	✓
Regional Climate Outlook Forums, Horn of Africa (GHACOF) seasonal forecasts in cooperation with ICPAC	✓	✓	✓	✓	✓
Tropical Cyclone Advisories for the Southwest Indian Ocean Countries; Enhanced availability of guidance information for the issue of tropical cyclone warnings by NMHS's at national level		✓		✓	
Preparedness to climate variability and change, natural disaster preparedness and enhanced food security in cooperation with SADC DMC and ICPAC		✓		✓	
Strengthen NHS's capacity to provide useful information to support integrated water resources management and flood forecasting in cooperation with SADC				✓	
Severe weather forecasting demonstration project; enhanced use of outputs for Numerical Weather Prediction Systems in cooperation with SADC.				✓	
< ProVention Consortium >					
Partners for Humanitarian and Risk Education Expansion (PHREE-Way) established regional platforms to facilitate, enable and mediate the learning and research		✓		✓	
Research & Action Grants for Disaster Risk Reduction; provide financial support to young researchers to undertake projects related to disaster risk reduction		✓		✓	✓
African Urban Risk Analysis Network (AURAN)		✓		✓	
< African Development Bank >					
Emergency Assistance for Drought Crisis in Kenya		✓			
EAC Backbone & lake Victoria Maritime	✓	✓	✓	✓	✓
< USAID >					
Strengthening Tanzania Disaster Response Project (STDRP)				✓	
Running of a public health school (a joint project with US Centers for Disease Control and Prevention (CDC))				✓	
< JICA, Ministry of Foreign Affairs >					
The Study on Integrated Flood Management for Nyando River Basin in the Republic of Kenya		✓			

Type of Program	Burundi	Kenya	Rwanda	Tanzania	Uganda
The Project for Enhancing Community Resilience against Drought in Northern Kenya		✓			
Capacity Development for Effective Flood Management in Flood Prone Area		✓			
The Programme for Community-based Flood Disaster Management to Adapt to Climate Change in the Nyando River Basin		✓			
The Programme for the Improvement of Capabilities to cope with Natural Disasters Caused by Climate Change	✓	✓			✓
Preliminary survey for reinforcement programme of meteorology system					✓

*: Participation of Uganda to the UNISDR Project was not confirmed in the literature review, but the information about the participation of Uganda was given on the meeting during the second dispatch.

ANNEX 8: SWOT Analysis

HFA-1: Governance and Policy

EAC Partner States

<p>Strengths</p> <ol style="list-style-type: none"> 1. Draft National Policies/Strategies for Disaster Risk Management are prepared. The policy in Uganda and Tanzania has been ratified. 2. National Platforms have been established. 3. Members of the National Platforms for DRM consist of cross-cutting sectors. 4. The organizations in charge of DRM have been established. 5. Some states have conducted DRR activities up to community level. 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Policies/strategies for DRM have not been ratified except Uganda and Tanzania. 2. Most of the organizations in charge of DRM are newly established, therefore capacities such as human resources, equipment and finance are insufficient. 3. Inadequate capacity for raising fund which can be used for disaster risk reduction activities. 4. HIV/AIDS and epidemic are considered as main matters of disaster, thus less amount of budget is utilized for natural disaster. 5. There are no clear mechanisms for integration of DRR in CCA-sector projects and development programs. 6. There are limited memorandums or treaties for cross-border issues related to DRM.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are assistances from International Organizations. 2. There is global trend in financing and promoting DRM activities. 3. Plans and Strategies related to DRM such as climate change adaptation and land use plan exist. 	<p>Threats</p> <ol style="list-style-type: none"> 1. There are possibilities of loss of key staffs (staff turnover, headhunting, etc). 2. National budget is insufficient. 3. Insecurity experienced by Partner state

EAC

<p>Strengths</p> <ol style="list-style-type: none"> 1. Implementation of HFA and the African Regional Strategy are emphasized in the 4th EAC Development Strategy. 2. Environmental disaster preparedness and management are stipulated in the Protocol on Environment and Natural Resources Management in EAC. 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. There is no sub-regional policy/plan on DRM considering trans-boundary issues. 2. There is no EAC DRR Platform (under preparation). 3. There is no DRM Unit in EAC. 4. There is lack of regular operational planning for DRM 5. There is inadequate of human resources and capacity on DRM 6. Mainstreaming of DRR issues to all sectors at EAC level is not in place. 7. There is no fund arrangement for DRM which can be used for disaster risk reduction activities. 8. There are no memorandums or treaties
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	for cross-border issues of DRM.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are other Instruments in the region like IGAD which can be learned and collaborated. 2. There are assistances from International Organizations. 3. There is global trend in financing and promoting DRM activities. 4. Members of the National Platforms for DRM of the Partner States consist of cross-cutting sectors. 5. The Climate change policy and strategy are in place. 6. DRR is an emerging as professional field 7. The Political will of Partner states in DRR 	<p>Threats</p> <ol style="list-style-type: none"> 1. The DRM priority could be low in the EAC considering the already existing structures within EAC. 2. There is inadequate funding allocation for DRM in EAC secretariat

HFA-2: Risk Identification and Early Warning

EAC Partner States

<p>Strengths</p> <ol style="list-style-type: none"> 1. Early Warning Systems exist in some sectors. 2. Some Partner states have own hazard maps for some sectors. 3. All states have communication systems for DRM. 4. EW Institutions are established and are being equipped 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Existing Early Warning Systems do not cover all sectors related to disasters. 2. Existing hazard profile maps do not cover all sectors for DRM and are not regularly updated. 3. There is limited standardization of hazard profile mapping. 4. Consolidated database or website where, various stakeholders and the general public can disseminate and access data and information on disaster risk management are insufficient. 5. Risk assessment results are not fully utilized for intervention and planning 6. Inadequate capacity of fund raising which can be used for disaster risk reduction activities. 7. Experts and equipment for EWS and assessment are insufficient. 8. Communication channels, education and information flow for hazard EW is relatively low in the EAC Partner States.
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	<p>9. There is no elaborate Hazard EWS with good lead time</p> <p>10. Assessment of social and other sector impacts induced by disaster in development activities are insufficient.</p> <p>11. Assessment and assistance for promotion of ecosystem management (soil protection), urban and land planning are insufficient.</p> <p>12. Assessment of small scale hazards like inter-tribal conflicts are insufficient.</p> <p>13. Preparation of monitoring and evaluation framework and guideline for the DRM activities for partner states are inadequate.</p>
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are assistances from International Organizations. 2. There is global trend in financing and promoting DRM activities. 3. There are multi-lateral coordination such as ICPAC, Lake Victoria and Nile Basin Initiatives. 	<p>Threats</p> <ol style="list-style-type: none"> 1. National budget is insufficient. 2. Impact of Climate change

EAC

<p>Strengths</p> <ol style="list-style-type: none"> 1. Existing mechanism for EWS concerning cross border conflicts 2. There're no sub-regional activities, fund raising for risk identification and EWS on DRM in EAC. 3. Preparation of monitoring and evaluation framework and guideline for the DRM activities for EAC secretariat are inadequate. 4. Promotion of monitoring and evaluation on the DRM for the EAC sub-region including urban and local communities are insufficient. 	<p>Weaknesses</p>
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are assistances from International Organizations. 2. Existing EWS in member state 3. There is global trend in financing and promoting DRM activities. 4. There are multi-lateral coordination such 	<p>Threats</p> <ol style="list-style-type: none"> 1. The DRM priority could be low in the EAC considering the already existing structures within EAC. 2. There is inadequate funding allocation for DRM in EAC secretariat

as ICPAC, Lake Victoria and Nile Basin Initiatives.	
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HFA-3: Use Knowledge, Innovation and Education

EAC Partner States

<p>Strengths</p> <ol style="list-style-type: none"> 1. Some universities have courses on DRM. 2. Education on disaster risk areas such as control of environment degradation leading to landslides, floods and soil degradation is conducted in schools in Partner States. 3. All countries have concrete education systems. 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. There is no comprehensive curriculum to conduct DRM education. 2. Some states do not have the capacity to carry out comprehensive DRM trainings. 3. Public awareness campaigns for DRM are insufficient. 4. There is inadequate establishment of information dissemination networks of DRR information and knowledge. 5. There is inadequate collection and dissemination of good practices and lesson learned on DRR. 6. There are inadequate research activities including traditional and indigenous knowledge within communities for DRM. 7. The level of public and local authorities’ perception and awareness of risks is still very low. 8. Capacity for DRM personnel and professionals is limited. 9. There is limited budget for DRM activities in research, awareness and education.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. All countries have concrete education systems. 2. There are assistances from International Organizations. 3. There is global trend in financing and promoting DRM activities. 4. There is a university network system called PeriPeri U (Partners Enhancing Resilience to People Exposed to Risks Universities). 	<p>Threats</p> <ol style="list-style-type: none"> 1. National budget is insufficient. 2. There is limited cooperation among the Partner States.

EAC

<p>Strengths</p> <ol style="list-style-type: none"> 1. There is a DRR advisor in EAC 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. There are limited activities on DRM in
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	the EAC secretariat.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. All countries have concrete education systems. 2. There are assistances from International Organizations. 3. There is Global trend towards DRM. 4. There is a university network system called PeriPeri U (Partners Enhancing Resilience to People Exposed to Risks Universities). 	<p>Threats</p> <ol style="list-style-type: none"> 1. The DRM priority could be low in the EAC considering the already existing structures within EAC. 2. There is inadequate funding allocation for DRM in EAC secretariat

HFA-4: Reducing the Underlying Risk Factors

EAC Partner States

<p>Strengths</p> <ol style="list-style-type: none"> 1. Plans related to land use and land management are in place. 2. Environmental Management Authorities have been established in all of the Partner States and ensure that all projects have EIA. 3. There are some kinds of insurance for disaster in some states. 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Land use plans are overtaken by urbanization. 2. There is inadequate implementation of the land use plans. 3. There are low public awareness. 4. There are limited research activities for environment and natural resources management related to DRM. 5. Food security as well as feed security for livestock for the area prone to disasters is limited. 6. There is limited financial risk sharing mechanism covering community people and their properties affected by disaster. 7.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are assistances from International Organizations. 2. There is global trend in financing and promoting DRM activities. 3. There are the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent. 4. There are new communication technology such as mobile phone, social media networks and radio especially in hazard early warning. 	<p>Threats</p> <ol style="list-style-type: none"> 1. National budget is insufficient. 2. Effects of climate change increase disaster risks. 3. Fast and rapid urbanizations increase disaster risks. 4. Exploration of gas, petroleum may pose some potential disasters in the future 5. High Poverty level expose our community to Vulnerability

EAC

<p>Strengths</p> <ol style="list-style-type: none"> 1. Environmental disaster preparedness and management are stipulated in the Protocol on Environment and Natural Resources Management in EAC. 2. Climate Change Strategy/Policy are in place. 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. There are limited activities for DRM.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are assistances from International Organizations. 2. There is global trend in financing and promoting DRM activities. 3. There are the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent. 4. There are new communication technology such as mobile phone, social media networks and radio especially in hazard early warning. 	<p>Threats</p> <ol style="list-style-type: none"> 1. The DRM priority could be low in the EAC considering the already existing structures within EAC. 2. There is inadequate funding allocation for DRM in EAC secretariat 3. Effects of climate change increase disaster risks. 4. Fast and rapid urbanizations increase disaster risks. 5. Exploration of gas, petroleum may pose some potential disasters in the future 6. High Poverty level expose our community to Vulnerability

HFA-5: Strengthen Disaster Preparedness for Effective Response

EAC Partner States

<p>Strengths</p> <ol style="list-style-type: none"> 1. Some states have national emergency fund. 2. All states have national emergency mechanism. 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Most of the EAC Partner States do not have enough funds for disaster response. 2. Most of the States do not have Standard Operation Procedure for Disaster. 3. Public safety and emergency contingency plans for effective response (all levels) are inadequate. 4. Promotion for other sector's activities such as water resources, transportation securement and food security as a priority is low.
<p>Opportunities</p> <ol style="list-style-type: none"> 1. There are assistances from International Organizations. 2. There is global trend in financing and promoting DRM activities. 3. There are the Civil Society 	<p>Threats</p> <ol style="list-style-type: none"> 1. National budget is insufficient. 2. Emerging threats e.g. Terrorism

<p>Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent.</p> <p>4. Multi-lateral cooperation such as Lake Victoria, ICPAC and Nile Basin Initiatives.</p>	
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EAC

<p>Strengths</p> <p>1. EAC has an initiative for cooperation.</p>	<p>Weaknesses</p> <p>1. There are limited activities for DRM.</p> <p>2. There is no rescue team for intervention that is ready and equipped (first aid kits, Organized communication gargets, ability).</p> <p>3. There are no memorandums or treaties for cross-border issues related to DRM.</p> <p>4. There is no emergency fund in EAC secretariat.</p>
<p>Opportunities</p> <p>1. There are assistances from International Organizations.</p> <p>2. There is global trend in financing and promoting DRM activities.</p> <p>3. There are the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent.</p> <p>4. There are Multi-lateral cooperation such as Lake Victoria, ICPAC and Nile Basin Initiatives.</p>	<p>Threats</p> <p>1. The DRM priority could be low in the EAC considering the already existing structures within EAC.</p> <p>2. There is inadequate funding allocation for DRM in EAC secretariat.</p> <p>3. Emerging threats e.g. Terrorism</p>

ANNEX 9: Cost Estimate for Implementation of the EAC DRRM Strategy

Cost Estimate for Implementation of the EAC DRRM Strategy (1)

Strategy/ Action	Period	Item/Description	Unit	Quantity	Unit Price (USD)	Amount (USD)	Expected Source of Budget
HEA Key Priority Area 1: Governance and policy						13,768,000	
Strategy 1.1: Provision of an inter-governmental framework for collaboration and partnership for the EAC Partner States in DRRM;						13,268,000	
(1)	Establishment of a legal framework and an Implementation Programme for effective coordination of the EAC DRRM Strategy					2,640,000	EAC, DPs
	2012-2013	Consultant: Remuneration	MM	80	20,000	1,600,000	
		Consultant: Other cost (50% of remuneration)	Ls	1		800,000	
		Workshop (3 days, 2 persons/country, 2 times/year)	time	4	20,000	80,000	
		Stakeholder Meeting (5 persons/country, 2 time/year)	time	4	40,000	160,000	
(2)	Establishment of the EAC DRR platform for coordination of the national platforms of partner states						included in Action (1), Strategy 1.1
	2012-2013	done in the consulting services for Action (1) of Strategy 1-1					
(3)	Operationalization of a DRRM unit within the EAC Secretariat which will oversee funding allocation and mobilization of resources					3,198,000	EAC, DPs
	2014-2016	EAC: Remuneration (5 experts and 1 admn. Assistant)	month	36	57,000	2,052,000	
		EAC: Other cost (50% of remuneration)	Ls	1		1,026,000	
		Workshop (3 days, 2 persons * 5 countries, 2 times/year)	time	6	20,000	120,000	
(4)	Development of adequate human capacity for the EAC DRRM unit to manage the EAC DRRM Strategy					120,000	EAC, DPs
	2014-2016	Overseas training (2 persons/year)	time	6	20,000	120,000	
(5)	Development of sub-regional standard operating procedures for DRRM including memorandums and treaties for cross-border issues related to DRRM					2,780,000	EAC, DPs
	2014-2016	Consultant: Remuneration	MM	90	20,000	1,800,000	
		Consultant: Other cost (50% of remuneration)	Ls	1		900,000	
		Workshop (3 days, 2 persons/country, 2 times/year)	time	4	20,000	80,000	
(6)	Mainstreaming disaster issues in all sectors of the EAC Secretariat and the EAC Partner States to accelerate the EAC DRRM activities					4,530,000	EAC, PSs, DPs, co-funding from other sectors
	2013-2016	Consultant: Remuneration	MM	120	20,000	2,400,000	
		Consultant: Other cost (50% of remuneration)	Ls	1		1,200,000	
		Workshop (3 days, 2 persons * 5 countries)	time	3	20,000	60,000	
		Pilot project (2014-2016, 2 projects/year/country)	project	15	50,000	750,000	
		Stakeholder Meeting (5 persons/country, others)	time	3	40,000	120,000	
Strategy 1.2: Support of integration of the DRRM into the EAC Partner States National Development Policies, Plans and Programmes;						0	
(1)	Establishment of the EAC DRRM Fund for all of activities of disaster risk management cycle						EAC, PSs, DPs, NGO, Private Sector
	2012-2013	done in the consulting services for Action (1) of Strategy 1-1. (Target amount of fund should be estimated in the detailed implementation programme.)					
(2)	Mobilization of resources for assistance of DRRM programmes and projects for the EAC Partner States						EAC DRRM fund
	2014-2016	done by EAC DRRM unit.					
(3)	Harmonization of DRRM strategies of the EAC Partner States, including promotion of community participation and identification of harmonized activities in DRRM in line with Climate Change Adaptation and Development Programs						included in Action (5), Strategy 1.1
	2014-2016	done in the consulting services of Action (5) of Strategy 1.1					
(4)	Facilitating ratification of DRRM Policies and Strategies among the Partner States						included in Action (1), Strategy 1.1
	2012-2013	done in the consulting services for Action (1) of Strategy 1.1					
(5)	Development of a sub-regional multi-sectoral contingency plan, a response plan, a relocation/resettlement plan based on national and sub-regional scales, considering trans-boundary problems and effects						included in Action (5), Strategy 1.1
	2014-2016	done in the consulting services for Action (5) of Strategy 1.1					
(6)	Aligning institutional structure to accommodate DRRM and avoidance of duplication across sectors						included in Action (1), Strategy 1.1
	2012-2013	done in the consulting services for Action (1) of Strategy 1-1					

Cost Estimate for Implementation of the EAC DRRM Strategy (2)

Strategy/ Action	Period	Item/Description	Unit	Quantity	Unit Price (USD)	Amount (USD)	Expected Source of Budget
Strategy 1.3: Development of DRRM capacity in the EAC Sub-Region						500,000	
(1) Assessment of capacity in finance, technology and human resources, and preparation of their inventory in the EAC Sub-Region							
	2012-2013	Assessment and preparation by the consulting services for Action (1) of Strategy 1-1					included in Action (1), Strategy 1.1
(2) Development and implementation of a capacity development plan for the EAC Sub-Region						200,000	
	2014-2016	Development by the consulting services for Action (5) of Strategy 1.1					included in Action (5), Strategy 1.1
		Training (3 days, 5 persons/contry, 2 times/year, implementation 2015-2016)	time	4	50,000	200,000	EAC DRRM fund, DPs
(3) Assessment and adaptation of local community traditional knowledge on DRRM in the EAC Sub-Region						300,000	
	2014-2016	Assessment and preparation by the consulting services for Action (5) of Strategy 1-1					included in Action (5), Strategy 1.1
		Pilot project (3 projects/country/year, 2015-2016)	project	30	10,000	300,000	EAC DRRM fund
HFA Key Priority Area 2: Risk identification and early warning						4,208,000	
Strategy 2.1: Provision of activities to identify, assess and monitor the disaster risks and enhance the early warning in the EAC Sub-Region						4,128,000	
(1) Creation of the EAC Disaster Information Center and facilitation of establishing and strengthening the Disaster Information Centers in the EAC Partner States, which collect, store and share more accurate DRRM information in and around the EAC Sub-Region						3,078,000	
	2012-2013	Preparation by the consulting services of Action (1) of Strategy 1.1					included in Action (1), Strategy 1.1
	2014-2016	Operation: Remuneration (5 experts and 1 administrative assistant)	month	36	57,000	2,052,000	EAC DRRM fund
	2014-2016	Operation: Other cost (50% of remuneration)	Ls	1		1,026,000	
(2) Encouragement of enhancement of multi-sectoral early warning system in each Partner State with adequate lead time						500,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015-2016	Pilot project (1 project/country)	project	5	100,000	500,000	EAC DRRM fund
(3) Establishment of the EAC Information Database for DRRM, including disaster and risk profiles, detailed hazard profile maps, strategies, programmes, early warning systems, communication system, lessons learned, good practices, and resources in the Sub-Region; which is necessary support for the Partner States in developing DRRM activities.						550,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015	Establishment of data-base (equipment, software, etc.)	Ls	1		500,000	EAC, DPs
	2016	Training (3 days, 5 persons/country)	time	1	50,000	50,000	EAC DRRM fund
(4) Encouragement of enhancing proper communication systems in the Partner States concerning DRRM							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(5) Assessment of social and other sector impacts induced by disaster in development activities in the EAC Sub-Region							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(6) Assessment and assistance for promotion of ecosystem management (soil protection), urban and land planning in the EAC Sub-Region							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(7) Assessment of small scale hazards like inter-tribal conflicts, refugees, armed conflicts which cumulatively have significant impacts on the communities							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(8) Mobilization of resources in the EAC Sub-Region to the activities including experts, equipment and funds							
	2014-2016	done by Experts of EAC Disaster Information Center and EAC DRRM Unit					EAC DRRM fund

Cost Estimate for Implementation of the EAC DRRM Strategy (3)

Strategy/ Action	Period	Item/Description	Unit	Quantity	Unit Price (USD)	Amount (USD)	Expected Source of Budget
Strategy 2.2: Monitoring and evaluation on the disaster risk in the EAC Sub-Region						80,000	
(1) Preparation of monitoring and evaluation framework and guideline for the DRR activities for the Partner States and EAC secretariat						0	
	2012-2013	Preparation by the consulting services of Action (1) of Strategy 1.1					included in Action (1), Strategy 1.1
(2) Promotion of monitoring and evaluation on the DRRM for the EAC Sub-Region including urban and local communities considering KAIZEN (continuous revising) in the Three Principle approach						80,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015-2016	Promotion seminar (5 persons/country, 1 time/year)	time	2	40000	80,000	EAC DRRM fund
HFA Key Priority Area 3: Use knowledge, innovation and education						340,000	
Strategy 3.1: Awareness creation on DRRM knowledge including traditional knowledge and research promotion in DRRM Sector						170,000	
(1) Establishment of a sub-regional DRRM Center of Excellence for research and training development							
	2012-2013	preparation by the consulting services for Action (1) of Strategy 1.1					included in Action (1), Strategy 1.1
	2014-2016	Operation: done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(2) Establishment of a network of relevant stakeholders for information and experience sharing including website creation						50,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
		website creation	Ls	1		50,000	EAC DRRM fund
(3) Promotion of traditional and indigenous knowledge within the community to adapt and cope with disaster							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(4) Promotion of use of modern technology in DRRM including application of space based technology						120,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2014	Workshop (3 days, 2 persons/country)	time	2	20,000	40,000	EAC DRRM fund
	2015-2016	Promotion seminar (5 persons/country, 1 time/year)	time	2	40,000	80,000	
Strategy 3.2: Promotion of mainstreaming DRRM into public and school education curricula						340,000	
(1) Establishment of education networks of DRRM in the EAC sub-region							
	2012-2013	preparation by the consulting services for Action (1) of Strategy 1.1					included in Action (1), Strategy 1.1
(2) Preparation and implementation of DRRM curricula, programmes and materials for education institutions						240,000	
	2014	Preparation by Expert of EAC Disaster information Center					included in Action (1), Strategy 2.1
	2014	Workshop (3 days, 2 persons/country)	time	2	20,000	40,000	EAC DRRM fund
	2015-2016	Trainers training (3 days, 5 persons/country, 2 times/year)	time	4	50,000	200,000	
(3) Promotion of extracurricular activities for DRRM, including use of mass media						100,000	
	2014-2016	Preparation by Expert of EAC Disaster information Center, in cooperation with the established education network and the NGOs					included in Action (1), Strategy 2.1
	2015-2016	Pilot project (USD 10,000/project/country/year)	project	10	10,000	100,000	EAC DRRM fund
HFA Key Priority Area 4: Reducing the underlying risk factors						700,000	
Strategy 4.1: Promotion of research activities of environmental and natural resources management, including activities related to identification of disaster prone areas, land use planning and human settlement (especially in enforcement of human settlement regulation) as key issues building community resilience to disasters.						0	
(1) Promotion of research and planning capacity							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(2) Enhancement of land use planning and human settlement capacity							
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(3) Mobilization of resource for research activities							
	2014-2016	arrangement by EAC Disaster Information Centet and EAC DRRM unit					included in Action (1), Strategy 2.1, and Action (3), Strategy 1.1

Cost Estimate for Implementation of the EAC DRRM Strategy (4)

Strategy/ Action	Period	Item/Description	Unit	Quantity	Unit Price (USD)	Amount (USD)	Expected Source of Budget
Strategy 4.2: Promotion of food security in the areas prone to disasters to enhance community resilience						0	
(1) Assessment of the areas prone to disasters in the EAC Sub-Region							
	2014	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(2) Assistance of promotion of food security as well as feed security for livestock for the areas prone to disasters							
	2015-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(3) Promotion of stock piling, food strategic reserves and taking advantage of harvests							
	2015-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
Strategy 4.3: Promotion of community based DRRM in the areas prone to disasters.						620,000	
(1) Promotion, involvement and Partnership of the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent in Community based DRRM activities and creation of DRRM Champion (Models)						80,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015-2016	Promotion seminar (5 persons/country, 1 time/year)	time	2	40000	80,000	EAC DRRM fund
(2) Consideration of gender and persons with special needs in response and preparedness						40,000	
	2014	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2014	Workshop (3 days, 2 persons/country)	time	2	20,000	40,000	EAC DRRM fund
(3) Promotion of new communication technology such as mobile phone, social media networks and radio especially in hazard early warning						500,000	
	2014-2016	preparation by EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015-2016	Promotion activities in communities (USD 50,000/country/year)	project	10	50,000	500,000	EAC DRRM fund
Strategy 4.4: Promotion of the development of financial risk-sharing and risk transfer mechanism, particularly insurance and reinsurance against disasters.						80,000	
(1) Research of financial risk sharing and risk transfer mechanism covering community peoples and their properties affected by disasters							
	2014-2015	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(2) Introduction of financial risk sharing and risk transfer policy with insurance against disaster motivating insurance companies and people covered						80,000	
	2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2016	Promotion seminar (5 persons/country)	time	2	40000	80,000	EAC DRRM fund
Strategy 4.5: Promotion of Public Private Partnership						0	
(1) Promotion of Corporate Social Responsibilities							
	2014-2015	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(2) Encouragement of corporates to use foundation's funds for DRRM activities							
	2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1

Cost Estimate for Implementation of the EAC DRRM Strategy (5)

Strategy/ Action	Period	Item/Description	Unit	Quantity	Unit Price (USD)	Amount (USD)	Expected Source of Budget
HFA Key Priority Area 5: Strengthen disaster preparedness for effective response						700,000	
Strategy 5.1: Interactive cooperation in search and rescue among the Partner States						120,000	
(1) Development of evacuation plans during emergencies						0	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
(2) Establishment of standardized search and rescue equipment like ambulance, etc.						40,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015-2016	Workshop (3 days, 2 persons/country)	time	2	20,000	40,000	EAC DRRM fund
(3) Assistance for promotion for other sector's activities such as water resources, transportation securement and food security as a priority						80,000	
	2014-2016	done by Experts of EAC Disaster Information Center					included in Action (1), Strategy 2.1
	2015-2016	Promotion seminar (5 persons/country)	time	2	40000	80,000	EAC DRRM fund
Strategy 5.2: Assistance of establishment of the emergency funds in respective partner states.						500,000	
(1) Encouragement of establishment of the emergency funds for the partner states							
	2014-2016	done by EAC DRRM unit					included in Action (3), Strategy 1.1
(2) Promotion of operationalization of emergency funds for the Partner State						500,000	
	2015-2016	done by EAC DRRM unit					included in Action (3), Strategy 1.1
		Promotion activities (USD 50,000/country/year)	no	10	50,000	500,000	EAC, DPs
Strategy 5.3: Promotion of cross-border cooperation mechanism for the emergency response and the cross-border issues.						80,000	
(1) Establishment of a cross-border cooperation mechanism and approved evidence, such as a memorandum among the EAC and the partner states for creation of the rescue team with the sub-regional nodes for emergency response including Standard Operation Procedures, etc.						40,000	
	2014-2015	done in the consulting services for Action (5) of Strategy 1.1					included in Action (5), Strategy 1.1
	2014-2015	Workshop (3 days, 2 persons/country)	time	2	20,000	40,000	EAC, DPs
(2) Implementation of the cross-border cooperation mechanism among disaster related organizations and private sectors						0	
	2016	done by EAC DRRM unit					
(3) Promotion of harmonized cross-border DRRM initiatives through joint planning and coordination among the EAC secretariat and the Partner States						40,000	
	2016	done by EAC DRRM unit					included in Action (3), Strategy 1.1
	2016	Promotion seminar (5 persons/country)	time	1	40000	40,000	EAC, DPs

Legend:

EAC: EAC secretariat

PSs: Partner states

DPs: Development partners

NGOs: Non governmental organizations

ANNEX 10: Project Summary of the EAC DRRM Strategy

1. DEVELOPMENT OF LEGAL FRAMEWORK AND IMPLEMENTATION PROGRAMME FOR EFFECTIVE COORDINATION OF THE EAC DRRM STRATEGY

PROJECT SUMMARY

Directorate	Productive and Social Sectors
Project Title	DEVELOPMENT OF REGAL FRAMEWORK AND IMPLEMENTATION PROGRAMME FOR EFFECTIVE COORDINATION OF THE EAC DRRM STRATEGY
Goal	To establish the effective coordination mechanism of the EAC and the Partner States for implementation of the EAC DRRM Strategy
Related EAC dev strategy objective	<ul style="list-style-type: none"> ▪ Implementation of HFA, the Africa Regional Strategy for Disaster Risk Reduction and its plan of action (4th EAC Development Strategy 2011/12-2015/16) ▪ Decision of the Sectoral Council on Environment and Natural Resources (October 2011)
Project Objective(s)	<ul style="list-style-type: none"> ▪ Provision of framework for collaboration and partnership for the EAC Partner States in DRRM ▪ Support of integration of the DRRM into the EAC Partner States National Development Policies, Plans and Programmes ▪ Development of DRRM capacity in the EAC Sub-Region ▪ Monitoring and evaluation on the disaster risk in the EAC Sub-Region
Key component(s)	<ol style="list-style-type: none"> 1. Establishment of a regal framework and a implementation programme for effective coordination of the EAC DRRM Strategy 2. Establishment of the EAC DRRM platform for coordination of the national platforms of partner states 3. Establishment of the EAC DRRM Fund for all of the activities of disaster risk management cycle 4. Facilitating ratification of DRRM Policy, Strategy and other frameworks among the Partner States 5. Aligning institutional structure to accommodate DRRM and avoidance of duplication across sectors in the EAC Sub-Region 6. Assessment and enhancement of capacity in finance,

	<p>technology and human resources, and preparation of their inventory in the EAC Sub-Region</p> <p>7. Preparation of creation of the EAC Disaster Information Center and facilitation of establishing and strengthening the Disaster Information Centers in the Partner States, which collect, store and share more accurate DRRM information in and around the EAC Sub-Region</p> <p>8. Preparation of establishment of a sub-regional DRRM Center of Excellence for research and training development</p> <p>9. Establishment of education networks of DRRM in the EAC Sub-Region</p>
Duration	24 months (2012-2013)
Total Project budget	Total project cost is estimated to be USD 2,640,000..
Officer in charge	Principal Environment and Natural Resources Officer
Submission date (dd/mm/yy)	--/--/--

2. OPERATIONALIZATION OF DRRM UNIT WITHIN THE EAC SECRETARIAT

PROJECT SUMMARY

Directorate	Productive and Social Sectors
Project Title	OPERATIONALIZATION OF DRRM UNIT WITHIN THE EAC SECRETARIAT
Goal	The DRRM Unit within the EAC Secretariat oversees funding allocation and mobilization of resources related to DRRM activities in line with the EAC DRRM Strategy.
Related EAC dev strategy objective	<ul style="list-style-type: none"> ▪ Implementation of HFA and the Africa Regional Strategy for Disaster Risk Reduction and its plan of action (4th EAC Development Strategy 2011/12-2015/16) ▪ Decision of the Sectoral Council on Environment and Natural Resources (October 2011)
Project Objective(s)	<ul style="list-style-type: none"> ▪ Provision of framework for collaboration and partnership for the EAC Partner States in DRRM ▪ Support of integration of the DRRM into the EAC Partner States National Development Policies, Plans and Programmes ▪ Assistance of establishment of the emergency funds in respective Partner States ▪ Promotion of research activities of environmental and natural resources management, including activities ▪ Promotion of cross-border cooperation mechanism for the emergency response and the cross-border issues
Key component(s)	<ol style="list-style-type: none"> 1. Operationalization of a DRRM unit within the EAC Secretariat 2. Development of adequate human capacity for the EAC DRRM unit to manage the EAC DRRM Strategy 3. Mobilization of resources for assistance of DRRM programmes and projects for the Partner States 4. Mobilization of resource for research activities of environmental and natural resources management 5. Encouragement of establishment of the emergency funds for respective Partner States 6. Promotion of operationalization of the emergency funds for respective Partner States 7. Implementation of the cross-border cooperation mechanism among disaster related organizations and private sectors for

	<p>effective response</p> <p>8. Promotion of harmonized cross-border DRRM initiatives through joint planning and coordination among the EAC secretariat and the Partner States for the effective response</p>
Duration	36 months (2014-2016)
Total Project budget	Total project cost is estimated to be USD 3,858,000..
Officer in charge	Principal Environment and Natural Resources Officer
Submission date (dd/mm/yy)	--/--/--

3. DEVELOPMENT OF SUB-REGIONAL STANDARD OPERATING PROCEDURES FOR DRRM

PROJECT SUMMARY

Directorate	Productive and Social Sectors
Project Title	Development of sub-regional standard operating procedures for DRRM
Goal	Sub-regional standard operating procedures for DRRM including memorandums and treaties for cross-border issues are developed for effective DRRM.
Related EAC dev strategy objective	<ul style="list-style-type: none"> ▪ Implementation of HFA and the Africa Regional Strategy for Disaster Risk Reduction and its plan of action (4th EAC Development Strategy 2011/12-2015/16) ▪ Decision of the Sectoral Council on Environment and Natural Resources (October 2011)
Project Objective(s)	<ul style="list-style-type: none"> ▪ Provision of framework for collaboration and partnership for the EAC Partner States in DRRM ▪ Support of integration of the DRRM into the EAC Partner States National Development Policies, Plans and Programmes ▪ Development of DRRM capacity in the EAC Sub-Region ▪ Promotion of cross-border cooperation mechanism for the emergency response and the cross-border issues
Key component(s)	<ol style="list-style-type: none"> 1. Development of sub-regional standard operating procedures for DRRM including memorandums and treaties for cross-border issues 2. Harmonization of DRRM strategies of the Partner States, including promotion of community participation and identification of harmonized activities in DRRM in line with Climate Change Adaptation and Development Programs 3. Development of a sub-regional multi-sectoral contingency plan, a response plan, a relocation/resettlement plan based on national and regional scales, considering trans-boundary problems and effects 4. Development and implementation of a capacity development plan for the EAC Sub-Region 5. Assessment and adoption of local community indigenous and traditional knowledge on DRRM in the EAC Sub-Region 6. Establishment of a cross-border cooperation mechanism and

	approved evidence, such as a memorandum among the EAC and the Partner States for creation of the rescue team with the sub-regional nodes for emergency response including Standard Operation Procedures, etc.
Duration	36 months (2014-2016)
Total Project budget	Total project cost is estimated to be USD 3,320,000..
Officer in charge	Principal Environment and Natural Resources Officer
Submission date (dd/mm/yy)	--/--/--

4. MAINSTREAMING DRRM IN ALL DEVELOPMENT THEMES AND SECTORS

PROJECT SUMMARY

Directorate	Productive and Social Sectors
Project Title	MAINSTREAMING DRRM IN ALL DEVELOPMENT THEMES AND SECTORS
Goal	DRRM is mainstreamed in all development themes and sectors in the EAC Sub-Region.
Related EAC dev strategy objective	<ul style="list-style-type: none"> ▪ Implementation of HFA and the Africa Regional Strategy for Disaster Risk Reduction and its plan of action (4th EAC Development Strategy 2011/12-2015/16) ▪ Decision of the Sectoral Council on Environment and Natural Resources (October 2011)
Project Objective(s)	Provision of framework for collaboration and partnership for the EAC Partner States in DRRM
Key component(s)	<ol style="list-style-type: none"> 1. Study on mainstreaming the DRRM in the development issues including the experience of the projects 2. Awareness creation in all development sectors through the seminars and workshops in the Partner States.. 3. Planning and implementation of the pilot projects in the Partner States for promotion of mainstreaming the DRRM..
Duration	48 months (2013-2016)
Total Project budget	Total project cost is estimated to be USD 4,530,000.
Officer in charge	Principal Environment and Natural Resources Officer
Submission date (dd/mm/yy)	--/--/--

5. CREATION OF THE EAC DISASTER INFORMATION CENTER AND FACILITATION OF ESTABLISHING AND STRENGTHENING THE NATIONAL DISASTER CENTERS IN THE PARTNER STATES

PROJECT SUMMARY

Directorate	Productive and Social Sectors
Project Title	CREATION OF THE EAC DISASTER INFORMATION CENTER AND FACILITATION OF ESTABLISHING AND STRENGTHENING THE NATIONAL DISASTER CENTERS IN THE PARTNER STATES
Goal	The EAC Disaster Information Center is established and operationalized and the National Disaster Information Centers in the Partner States are established and strengthened, for promotion of DRRM activities in the EAC Sub-Region
Related EAC dev strategy objective	<ul style="list-style-type: none"> ▪ Implementation of HFA and the Africa Regional Strategy for Disaster Risk Reduction and its plan of action (4th EAC Development Strategy 2011/12-2015/16) ▪ Decision of the Sectoral Council on Environment and Natural Resources (October 2011)
Project Objective(s)	<ul style="list-style-type: none"> ▪ Provision of activities to identify, assess and monitor the disaster risks and enhance the early warning systems in the EAC Sub-Region ▪ Monitoring and evaluation on the disaster risk in the EAC Sub-Region ▪ Awareness creation on DRRM knowledge including indigenous and traditional knowledge and research promotion in DRRM Sector ▪ Promotion of mainstreaming DRRM into public and school education curricula ▪ Promotion of research activities of environmental and natural resources management ▪ Promotion of food security in the areas prone to disasters to enhance community resilience. ▪ Promotion of community based DRRM in the areas prone to disasters ▪ Promotion of the development of financial risk-sharing and risk transfer mechanism, particularly insurance and reinsurance against disasters ▪ Promotion of Public Private Partnership

	<ul style="list-style-type: none"> ▪ Interactive cooperation in search and rescue among the Partner States
<p>Key component(s)</p>	<ol style="list-style-type: none"> 1. Creation of the EAC Disaster Information Center and facilitation of establishing and strengthening the Disaster Information Centers in the Partner States, which collect, store and share more accurate DRRM information in and around the EAC Sub-Region. 2. Encouragement of enhancement of multi-sectoral early warning system in each Partner State with adequate lead time 3. Establishment of the EAC Information Database for DRRM, including disaster and risk profiles, detailed hazard profile maps, strategies, programmes, early warning systems, communication system, lessons learned, good practices, and resources in the region; where necessary support for the Partner States in developing DRRM activities. 4. Encouragement of enhancing proper communication systems in the Partner States concerning DRRM 5. Assessment of social and other sector impacts induced by disaster in development activities in the EAC Sub-Region 6. Assessment and assistance for promotion of ecosystem management (soil protection), urban and land planning in the EAC Sub-Region 7. Assessment of small scale hazards like inter-tribal conflicts, refugees, armed conflicts which cumulatively have significant impacts on the communities 8. Mobilization of resources including experts, equipment and funds in the EAC Sub-Region to the activities to identify, assess and monitor the disaster risks and to enhance the early warning 9. Promotion of monitoring and evaluation on the DRRM for the EAC Sub-Region including urban and local communities considering KAIZEN (Continuous revising) in the JICA Three Principles Approach 10. Establishment of a sub-regional DRRM Center of Excellence for research and training development 11. Establishment of a network of relevant stakeholders for information and experience sharing including website creation. 12. Promotion of traditional and indigenous knowledge within the community to adapt and cope with disaster

	<ol style="list-style-type: none"> 13. Promotion of use of modern technology in DRRM including application of space based technology 14. Preparation and implementation of DRRM curricula, programmes and materials for education institutions 15. Promotion of extracurricular activities for DRRM, including use of mass media 16. Promotion of research and planning capacity 17. Enhancement of land use planning and human settlement capacity 18. Assessment of the areas prone to hazards in the EAC Sub-Region 19. Assistance of promotion of food security as well as feed security for livestock for the area prone to disasters 20. Promotion of stock piling, food strategic reserves and taking advantage of harvests 21. Promotion, involvement and Partnership of the Civil Society Organizations (CSOs), Community Based Organizations (CBO), and NGO including the Red Cross and the Red Crescent in Community based DRRM activities and creation of DRRM Champion (Models) 22. Consideration of gender and persons with special needs in response and preparedness 23. Promotion of new communication technology such as mobile phone, social media networks and radio especially in hazard early warning 24. Research of financial risk sharing and risk transfer mechanism covering community peoples and their properties affected by disasters 25. Introduction of financial risk sharing and risk transfer policy with insurance against disaster motivating insurance companies and people covered 26. Promotion of Corporate Social Responsibilities 27. Encouragement of corporates to use foundation's funds for DRRM activities 28. Development of evacuation plans during emergencies 29. Establishment of standardized search and rescue equipment like ambulance, etc., for effective response 30. Assistance for promotion for other sector's activities for effective response, such as water resources, transportation
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	securement and food security as a priority
Duration	36 months (2014-2016)
Total Project budget	Total project cost is estimated to be USD 5,458,000.
Officer in charge	Principal Environment and Natural Resources Officer
Submission date (dd/mm/yy)	--/--/--

添付資料 2.

第 1 次現地調査：主要面談者リスト

List of Interviewees

1. Task Force Meeting in Burundi

No.	Name	Country/Institution
1.	Naima Mrisho	Tanzania
2.	Charles Msangi	Tanzania
3.	Abach W. Namaa	Kenya
4.	Julius N. Mwabu	Kenya
5.	KAYIRA Justin	Rwanda
6.	Fred Daniel NZASABIMANA	Rwanda
7.	Rose Mbenvu	Uganda
8.	Pamela Komujuni	Uganda
9.	Christian Otieno	PeriPeri U
10.	General NIMENYA Hermenegilde	Burundi
11.	Colonel Anicet NIBARUTA	Burundi
12.	Prof. Jean Marie SABUSHIMIKE	Burundi
13.	Mrs Amie Louise NDIKUMWENAYO	Burundi
14.	Julius Kabubi	EAC
15.	Wivine Ntamubano	EAC
16.	Almami Dampha	AUC
17.	Aneson Cadribo	AUC
18.	Dr. Timami	AUC

2. Burundi

1) National Platform

Name	Affiliation	Position
Nestor Bakundukize	Ministry of Communication	Director of National Television and the Member of the Platform
Dr. E.S. Pes Ndayishimye	Ministry of Public Health and Aids Prevention	Chief of the unity for urgent epidemiological risks and catastrophes.
Amis-Louise Ndikumwenayo	Ministry of Youth, Sport and Culture	
Colonel Nibaruta Anicet	Ministry of Public Security	DRR Platform Secretary
Jean Maric Sabushimike	University of Burundi. Faculty of Sciences	Environment Expert
Ntaconiyigize Philibert	Ministry of Public Security	Chief of the Unit for the Protection of Environment
Nizigiyimana Anicet	Ministry of Public Ssecurity	Chief of the Unit of Prevention

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Elie Nyambere	General Direction for Civil Protection, Direction for Prevention and Research	Chief of the Unit of Documentation and Archives
Felecite Niyonzima	Ministry of External Relation	Member of PFMPGC

2) UNDP

Therese NDAYISENGA	Program Officer
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3) IGEBU

Ndayaishimiye Renidle	National Focal Point UNFCCC
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4) JICA Burundi

Miwa SASAKI	Programme Coordinator
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3. Kenya

1) NDOC

Col. (KAF-rtd) Nathan M. Kigotho	Director
Lt.Col. Jeremiah N.Njagi	Deputy Director

2) NDMA

Charles Otieno Konyango:	Ministry of State for Development of Northern Kenya & other Arid Lands Deputy Director of Infrastructure and Physical Planning (C/P of JICA project) Director, NDMA
James Oduor	Ag. CEO
Salim Shaabwi	DMO
Mary Mwau:	DMO

3) MWI

Nyaolo	Director
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4) WRMA

John P. Olum	Chief Executive Officer
Joseph M. Kinyua	Technical Manager

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5) DRR

Abach Namaa	Assistant Secretary 1 Disaster Risk Reduction
Gordon Otieno Muga	Assistant Secretary 1 Disaster Risk Reduction
Onserio Joshua	MOSSP: Attaché
Getanda Ordieki:	MOSSP: Attaché
Duncan Mjangre	MOSSP: Intern
Mbungna Jacqueline	MOSSP: Attaché
Lurah C. Massor:	MOSSP: Attaché
Penuel Mwangi	MOSSP: Attaché
Collins Cichuki:	MOSSP : Attaché

6) JICA Kenya

Hideo Eguchi	Chief Representative
Juinichi HANAI	Senior Representative
Meri Fukai	Project Formulation Advisor
Tekeshi KOZU	Regional Project Formulation Advisor (Regional Integration)

7) JICA Experts

Kenichi TSUKAHARA	Professor, Department of Engineering Director, Disaster Risk Reduction Research Center, KYUSHU UNIVERSITY
Hajime KOBAYASHI	Chief Advisor
Hideki SAWA	Team Leader of the Project on Capacity Development for Effective Flood Management
Yukihiro MIKUMO	Community-based Disaster Management Engineer of the Project on Capacity Development for Effective Flood Management

4. Tanzania

1) DMD

Naima Mrisho	
Charles Msangi	
Fanuel O.S. Kalugando	Civil Engineer & Disaster Risk Management Expert

2) Ministry of Agriculture

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Ombaeh Lemweh	National Food Security Division, Crop Monitoring & Early Warning Assistant Director
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3) TMA

Dr. Agnes L. Kijazi	Director General
Dr. H. Kabelwa	Director of Forecasting
A.D.Kanemba	Manager of International and Regional Programme
F.F. Tilya	Manager, Central forecasting office
H.Msemo	Head Public weather services

4) MOW

Kalunde K. Malall	Water Resources Division, Monitoring & Assessment Section, Dam Safety & Flood Management Engineer
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5) JICA Tanzania

Yukihide KATSUTA	Chief Representative
Minoru HOMMA	Senior Representative
Shin MARUO	Representative

5. Uganda

1) OPM

Martin Owor	Relief, Disaster Preparedness and Management Commissioner
Rose Nakabugo Bwenvu	Assistant Commissioner

2) Mini National Platform

Name	Affiliation	Position
Charlie Kabanga	OXFAM	Resilience and Emergency
Arinaitwe Jjoan	Ministry of Water and Environment	Sociologist
Leo Mwebembezi	Ministry of Water and Environment/DWRM	Team Leader, KYOGA WM2
Malika Ogwang	ACTED(NGO)	EWS Specialist
Racheal .N. Mweke	OPM	Coordinator Disaster Risk Reduction
Chebet Maikut	CCU/MME	PCCO-Mitigations Markets

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Batale James	Ministry of Water and Environment, Meteorology	Meteorologist
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3) JICA Uganda

Hirofumi HOSHI	Chief Representative
Shintaro TAKANO	Representative
Lubega Paul	Assistant Program Officer

6. Rwanda

1) MIDIMAR

Kayira Justin	Director
Budederi Eric	Disaster Management Officer

2) RNRA: Rwanda Natural Resources Authorities

Vincent de Paul KABALISA	Deputy Director General
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3) MINAGRI: Ministry of Agriculture and Animal Resources

Regis CHIWAYA	Consulting Irrigation Engineer
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4) JICA Rwanda

Hiroyuki KOBAYASHI	Chief Representative
Kohei TAKIMOTO	Programme Manager (Water/ Sanitation)
Lubega Paul	Assistant Programme Officer

7. EAC

1) EAC

Julius Kabubi	Disaster Risk Reduction Advisor EAC Secretariat
Wivine Ntamubano	Principal Environmental Officer Productive Sectors, EAC Secretariat

2) JICA Expert

Nobuyuki YASUI	JICA Advisor
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