



A gap analysis of the legislative, policy, institutional and crises management frameworks for disaster risk management in Cameroon

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ABSTRACT

This paper evaluates and analyses Cameroon's contemporary legislative, policy, institutional, administrative, and governance/power structures for disaster risk management (DRM) to identify gaps for improvement. A qualitative research strategy was used to assess Cameroon's compliance with international DRM frameworks in order to determine their effectiveness. The Sendai Framework for disaster risk reduction (SFDRR) provided conceptual guidance to the enquiries and systematic analysis. An evaluation of Cameroon's DRM legislation, policies, institutions, and governance suggests the existence of basic structures with on-paper provisions for a decentralised, multi-hazard and multi-disciplinary/agency DRM approach. Embedded in the structures are standard protocols for responding to natural hazards, crises/emergencies, or disasters. Yet, operationally, Cameroon's DRM system is yet to attain its full potential. A gap analysis reveals the frameworks are mainly natural hazard, crises/disaster driven. Details of stakeholder roles and responsibilities are either vague or not explicit in the statutory instruments. The inclusion of clearly defined guidelines for cross-sectoral and multi-stakeholder interventions in the DRM instruments is limited. The DRM frameworks are generally more reactive than proactive and adopts a hierarchical top-down decision making and power structure where lower administrative units are not sufficiently empowered to efficiently perform DRM functions. Generally, the contemporary DRM structures undermine the ability to enhance resilience to disaster risks. Recommendations from a gap analysis suggests that an overhaul of the DRM frameworks is inevitable to curb the rising disaster risks in the country. Any reorganisation must consider elevating the Directorate of Civil Protection to an independent/autonomous structure placed directly under the Prime Minister's Office or the Presidency.

1. Introduction

The implementation of disaster risk management (DRM) strategies should be underpinned by suitable legislative frameworks [1,2]. This is not the case in most developing countries, which are more susceptible to natural hazard-induced disasters than developed countries [3]. With concerns that around 80% of the world's poorest countries will be living in fragile contexts by 2030 if they do not make considerable effort in mitigating disaster risks [4], strengthening their DRM frameworks is a topical matter in national, regional, and international disaster management (DM) frameworks.

DRM legislative frameworks are relevant to guide the formulation and implementation of plans/programmes at different administrative levels with specific objectives and related actions for identifying, monitoring, assessing, and reducing disaster risks, and should be accompanied by adequate resource allocation and time frame to achieve the various programme activities [1,2]. Indeed, adequate legislative, institutional, policy, administrative and/or governance mechanisms can establish mandates for DRM stakeholders including recognisable functions, decision-making, roles,

and responsibilities as well as development institutions. This incentivises investments in risk reduction and stakeholder participation from the public and private sectors [5]. Yet, many countries are still to achieve this goal despite having endorsed the Sendai Framework.

The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015–2030 reiterated and reinforced the essential role of nation states in protecting their citizens from disaster risks through the formulation, regular review and implementation of DRM laws and policies [6]. Worryingly the protection needed from governments is disproportionately low in developing countries. This is partly due to weak legislative, policy and institutional frameworks, including limited resources/capacities to cope with, resist, respond and recover from disasters. These variables have contributed to the dysfunctional DRM process in many African countries [7,8] including in Cameroon where disaster risks are increasing [9].

Contemporary disaster risk reduction (DRR) research in Cameroon over the past two decades has revealed increasing vulnerability and economic losses from hazards/disasters related to deficiencies in legislative, policy and institutional arrangements that have not-so far-been sufficiently countered by adequate DRR measures [9–18] Cameroon's ambition to achieve

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sustainable development [9,16] will be an elusive prospect without addressing these issues. This provides justification for this article, with specific objectives to: (1) review the various legislative, policy, administrative and institutional instruments for the governance of disaster risks; (2) carry-out a gap analysis of the effectiveness of their application to desired performance by highlighting limitations/challenges; and (3) make suggestions and/or recommendations to close the identified gaps.

2. Overview of Cameroon's DRM profile

A snapshot of Cameroon's disaster risk profile provides a convincing argument for a vigorous DRM framework in the country. Cameroon has a diverse disaster risk profile that makes the country prone to natural,

socio-natural, technological, and social and anthropogenic hazards (see Fig. 1 and Table 1).

Most of the hazards have a high incidence and frequency, often intersecting with the relatively high vulnerabilities of the dominantly agrarian population [19] that has been trapped in a vicious cycle of poverty and hunger for many decades [12]. It is no surprise, therefore, that Cameroon regularly experiences emergencies, crises, and disasters. The high-risk profile has been compounded in recent years with the occurrence of humanitarian crises. The most recent is the ongoing Anglophone crisis that started in 2016 and has been exacerbated by armed secessionist movements with resultant violence that has affected around 3 million people in Cameroon's Anglophone Regions (North West and South West Regions) including around 705, 800 internally displaced persons (IDPs) within or

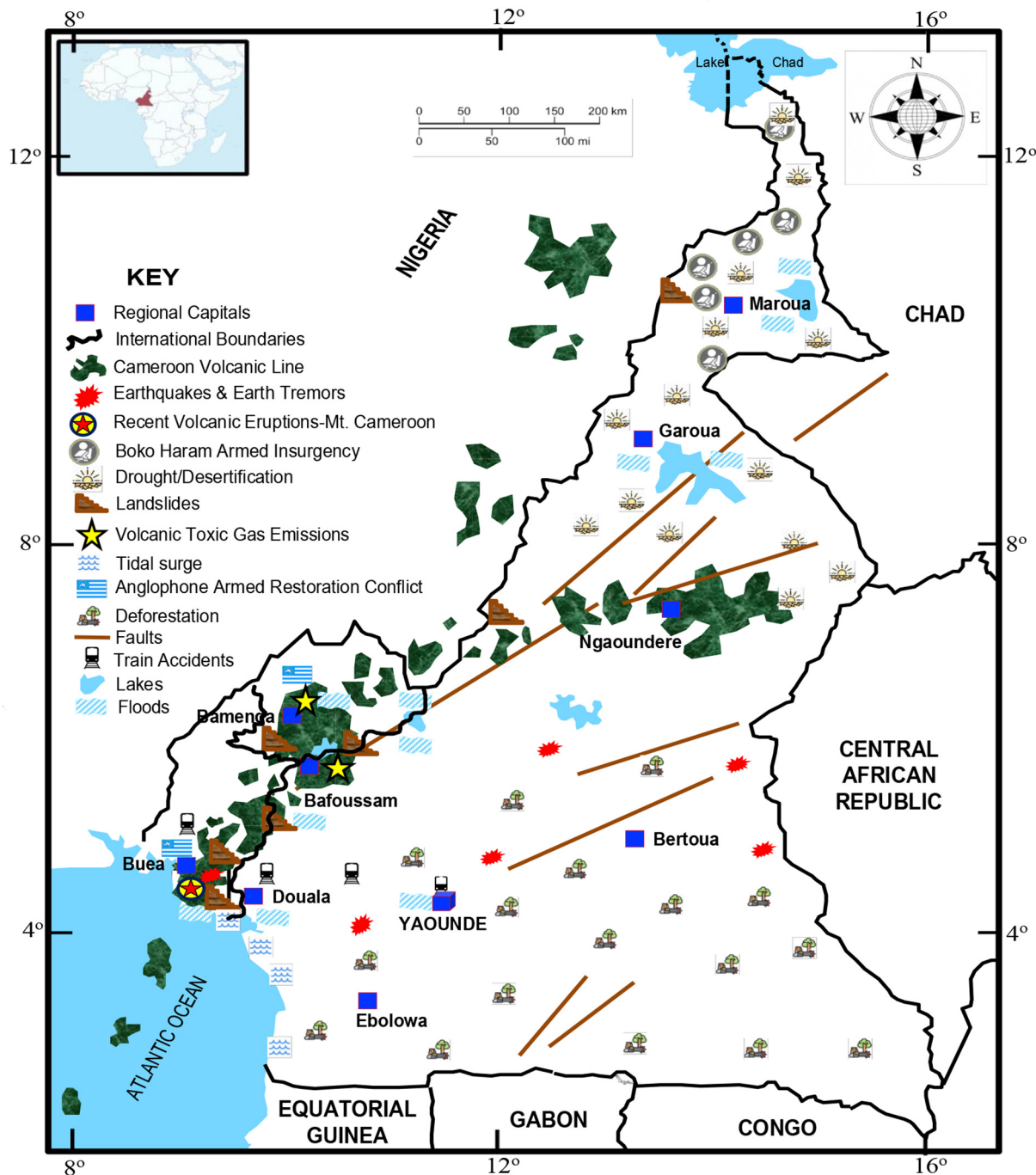


Fig. 1. Cameroon map showing locations of the main hazards in the country. Source, adapted from [9]

Table 1
Different hazard group/types in Cameroon with some examples from 1980 to 2019.

Hazard group	Hazard type	Examples
Natural	Geological	Volcanic eruptions Mount Cameroon (1909, 1922, 1954, 1959, 1982, 1999/2000, 2012). Gas emissions from crater Lakes Lake Monoum (1984); Lake Nyos (1986).
Potentially socio-natural	Meteorological	Regular tornadoes/storms/thunder strikes in South, Far North, Adamawa and North Regions.
	Hydrological	Flash Floods Kribi (1998), North Region (2008, 2014); Far North (1994, 1996, 1997, 1998, 1999, 2000, 2005, 2006, 2007, 2010, 2012, 2013, 2014); Douala (August 2000, June 2015); Limbe (2001; July 2013), Yaounde (April 2008); Bakassi Peninsula (2014); Bamenda (marshy areas of Mulang, below Foncha and Ntasin—August 2014) Landslides South West (Bafaka Balue, 1997; Wabane, August 2013); Centre (Yaounde, 1998); Bamboutous (June 2003); Bonduma neighbourhood, Buea (August 2006); Kekem (October 2007); Bamenda Escarpment (August 2009); Akwaya Sub Division (August 2012); Tombel-Bangem highway (August 2015).
	Biological	Elephant destructions Far North (Diamare, 1996, 1998, 1999, elephants from Kalfou Wildlife Park 2014). Famine/Drought/Locust invasion Far North (1998–1999–2001) with loss of 140 tons of cereals per year; Maroua (2011). Epidemics/Pandemics Cholera (North and Far North, 1996, 1998, 1999, 2010, 2011, 2014; Douala, 2004, 2005, 2011); Meningitis (Far North, 1998); Red diarrhoea (East, 1997; Messock, 1998 and Mbalmayo, 1999; Menchum Division, 2010; Far North, 2011); Measles (Maroua, 2008–2009); Malaria (Northern Regions, 2013—more than 12,000 victims); COVID-19 pandemic (Entire country, from 2020 and ongoing)
Technological	Fires	Fire incidents Nsam (1998), Bafoussam market (1999), Mokolo market (1998), Limbe market (2000), Sangmelima market (1998), Essos market, Yaoundé military headquarters ammunition depot (2001), Kumba market (2005, 2009), Tiko market (2010), Mboppi market, Douala (2011); Congo market, Douala (2012), Kumba Hospital (2019), SONARA Oil Refinery (2019).
	Industrial Transportation	Gas Nsimalen (1996). Road crashes Average of 1000 per year 3 Plane crashes Cameroon Airlines (1995 and 1984); Kenya Airways (2007). Train crashes 271 derailments in 1998; 5 crashes from October 2016–December 2017 (October 2016 in Eseka, November 2016 in Ndokoti, March 2017 in Elig-Edzoa, July 2017 in Makondo, December 2017 in Maboni)
Social and Anthropogenic	Crowd-related	Riots due to civil service salary slashed by 65% (1993) Riots caused by fuel/food price hikes, (February 2008; July 2014) Civil unrest rallies by opposition parties (1992–1994) Mass demonstrations in the Anglophone region following the unilateral declaration of independence by the Interim government of Ambazonia (October 2017)
	Armed Conflict	Bakassi peninsular crisis the 1990s The Anglophone crises turned into an armed conflict From 2017 and ongoing
	Terrorist activity	Boko Haram insurgency in northern Cameroon From 2014 and ongoing

Source: Adapted from [9].

displaced from the affected region [20]. Worryingly also, Cameroon's response to the ongoing COVID-19 pandemic has unmasked issues with the response that undermines the governance of, or resilience to a novel health crisis [21,22].

3. Disaster risk management framework—Understanding the concept

The UN defines DRM as “the application of DRR policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses” ([1], p.16). DRR legislation is conceptualised as an ensemble of laws and rules that incorporates DRM priorities, institutional mandates, national DRM planning and policy, government responsibilities, community/civil society participation, resource allocation, public awareness, and early warning systems [23]. The legislative framework for DRM, therefore, incorporates the legal and regulatory instruments and institutional/agency mandates required to apply DRR and DM policies to enhance community resilience to disaster risks and losses. DRR-related activity is described in the Organisation for Economic Co-operation and Development (OECD) Development Assistance countries (DAC) policy document as one that reduces existing disaster risks, enhances resilience and prevents new risks by focusing on “the implementation of ... and measures that prevent and reduce hazard exposure and vulnerability to disaster and increase preparedness for response and recovery with the explicit purpose of increasing human security, well-being, quality of life, resilience, and sustainable development” ([4], p.8). In this article, DRM framework encompasses DRR (ex-ante processes to mitigate existing disaster risks) and DM processes (preparedness, response, and post-disaster recovery) inclusive of the DRR legislative (laws and regulations), policy, administrative, institutional and crises management frameworks established within a country for coordinated and systematic DRM.

4. Conceptual underpinning—International DRM frameworks

Contemporary regional/international DRM platforms have highlighted the role of legislative, regulatory institutional and/or policy instruments in building community resilience to disaster risks by mitigating existing risks and preventing new risks. For instance, the Hyogo framework for action (HFA) 2005–2015 underscored the relevance of good legal frameworks to support DRR [2]. Its successor, the SFDRR 2015–2030 classified activities linked to DRR as those that seek to achieve “substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries” ([6], p.12).

Indeed, a DRR-related activity must meet at least one of the four priorities for action of the Sendai Framework, namely: (1) understanding disaster risk; (2) strengthening disaster risk governance to manage disaster risk; (3) investing in DRR for resilience; or (4) enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation, and reconstruction. The SFDRR stresses that DRR measures should be in accordance with national laws and regulations. Consequently, governments have been urged to “...support the implementation of DRR by developing new or amending relevant legislation...” (p.18); “...mainstream and integrate DRR within and across all sectors and review and promote the coherence and further development, as appropriate, of national and local frameworks of laws...” and “...assign, as appropriate, clear roles and tasks...within DRM institutions and processes and decision-making through relevant legal frameworks...” (p.17). The SFDRR further emphasises the establishment, functioning and strengthening of national and local platforms for DRR; resource allocation, including finances and logistics; community resilience to disaster risks and that the involvement of non-state stakeholders in DRR should be underpinned by the relevant legislative frameworks (laws, standards, regulations, and procedures).

In tandem, the UNDP, in collaboration with the International Federation of the Red Cross and Red Crescent Societies (IFRC) have been working to provide an enabling regulatory environment for DRR by providing practical guidance to governments to review and enhance their laws and regulations to prioritise DRM. To fulfil this aim, both organisations have developed a checklist for countries to consider in order to ensure their laws provide optimal support for DRR [5].

5. Methodology

The incentive of this research was to critically examine the current state of Cameroon's DRM framework. Conceptual guidance and orientation to the research enquiries has been provided by international DRM frameworks, particularly the SFDRR, which detailly articulate the key requirements for effective DRM that countries should adopt. Qualitative research tools were employed to generate the required data [24].

This research utilises a blend of data gathering instruments from primary, secondary, and historical sources to investigate Cameroon's DRM framework. The disruption caused by the COVID-19 pandemic poses unprecedented challenges to empirical data collection. In such situations, primary data is invaluable [25]. Primary information comprises of contemporary and archival administrative and/or governance data from policies, legislations, plans/programmes, technical reports, laws, decrees, presidential/prime ministerial instructions, manuals, training manuals, and communiques on emergencies, crises, and disasters available in government Ministries and Agencies. Most of the primary information sources were derived from the Ministry of Territorial Administration and Decentralisation (MTAD) and its agency, the Directorate of Civil Protection (DCP). Regional and International DRM country assessment reports on Cameroon also informed the primary data. The country reports provide invaluable insights into the research objectives since they have been compiled by experts and DRR specialists and are regularly updated. Hence, they provide the most recent perspective of some of the DRM issues under investigation.

Secondary data sources included books and academic articles. A literature review was undertaken to identify books and academic articles that address the issues under investigation [26]. Whilst the search for older historical information was relevant to provide background context to the study in some areas, the search focused mainly on sources published within the past 16 years. This approach ensured the data was contemporary or as current as possible since the motive is to understand whether the DRM framework is suitable for Cameroon's growing disaster risks. The search criteria for books/articles concentrated on those that addressed DRM and related themes in Cameroon like policies, laws, legislation, institutions, plans, programmes, processes, risk reduction, disaster preparedness and response and case studies of hazards/disasters.

Most of the primary and secondary data were readily available online on the web portals of government and international institutions/organisations, or related electronic databases or sources. All the information sources are referenced in the applicable points in the article and serve to elicit theoretical and practical knowledge on the past and recent state of Cameroon's DRM.

After securing all relevant information, content analysis was used to identify and categorise the DRM components [26] into six DRM themes with conceptual guidance from the SFDRR. Triangulation of data from the wide variety of primary and secondary sources enhanced the research validity and reliability. The findings are presented in a systematic, analytical, and descriptive format [27].

The availability of empirical data could have enhanced the analysis. Since this research was conducted during the COVID-19 pandemic, face-to-face interviews were difficult due to infection control measures that prohibited close physical contact. Secondly, attempts to do telephone interviews was challenging since most senior DRM stakeholders were deeply involved with the COVID-19 crisis management and did not consider responding to research enquiries a priority. It was also challenging to identify the full range of DRM activities. This is because some activities and/or documentation in stakeholder institutions are often not sufficiently described or categorised under DRM related themes.

6. Results

6.1. Evolution of Cameroon's legislative framework for DRM

The concept of Civil Protection (CP) has been adopted in Cameroon to express the legislative, policy and institutional frameworks for DRM and

the country's disaster risk profile [28,29]. CP has its roots in the National Federation of Civil Protection (FNPC) Act that was created in France in 1965 to protect the populace from disaster risks. The concept was enshrined in Law No.67/LF/9 (Section 11 and 12) of 12 June 1967 after Cameroon obtained independence from France and Britain in the 1960s. Since then, there has been several decrees, laws, instructions (referred collectively here as legislative framework) under the guise of CP (Table 2) [15,16,29,30].

Since Cameroon's independence in 1960, the legislative instruments have informed the functions of the various CP activities, designated, and determined the functions of DRM institutions and agencies, established new DRM institutions/agencies, re-organised DRM institutions and agencies, designated new functions and responsibilities to DRM agencies, determined and classified old/emerging risks, and ratified disaster management/CP conventions. The legislative framework prior to 1986 was skewed towards the protection of civilian infrastructure despite other disaster risks that threatened the dominantly agrarian livelihoods of the populace and

Table 2
Evolution of the legislative framework for DRM in Cameroon.

Date/Year	Law/Decree	Context/Purpose in Cameroon.
June 12, 1967	Law No. 67/LF/9	General organisation of civil defence/protection in Cameroon. with the Ministry of Territorial Administration and Decentralisation (MTAD) as the responsible ministry to implement and coordinate CP measures.
January 18, 1968	Presidential Decree No.02/CAB/PRC	Safeguard and protection of civil installations and infrastructure of vital importance in the country
August 11, 1971	Law No. 71/DF/381	Organisation of MTAD
September 1, 1972	Presidential Instruction No.16/CAB/PRC	Organisation of rescue activities in Cameroon
March 14, 1974	Decree No. 74/199	Operations focused on the exhumation and transfer of corpses.
December 6, 1986	Law No. 86/016	General reorganisation of civil protection in Cameroon
August 24, 1987	Presidential Instruction No. 005/CAB/PR	Monitoring Cameroon's security.
March 12, 1996	Decree No. 96/054	Creation, composition, and responsibilities of the National Council for Civil Protection (NCCP).
March 9, 1998	Decree No. 98/031	Organisation of emergency and relief plans in Cameroon.
July 14, 1998	Law No. 98/015	Classification of establishments as dangerous, unhealthy, or obnoxious.
July 17, 1998	Law No. 98/147	Re-organisation of the MTAD
July 25, 2001	Law No.2001/182	Establishing the functions of the National Fire Brigade (Sapeurs Pompiers).
January 18, 2002	Decree No. 2002/018	Ratify the Framework Convention on Emergency Aid in Civil Defence adopted on May 22, 2000 in Geneva.
March 19, 2003	PM Decision No.037/PM	Creation and functions of a National Risk Observatory (NRO).
April 24, 2004	Decree No. 2004/009	Reorganisation of MTAD
December 8, 2004	Decree No. 2004/320	Making civil protection a key function of MTAD.
Mach 15, 2005	Decree No. 2005/124	Establishes an emergency telecommunications service for disaster prevention and mitigation.
April 13, 2005	Decree No. 005/104	Management of civil aviation security crises in Cameroon
September 6, 2005	Decree No. 2005/327	Management of civil aviation security services in Cameroon
September 17, 2010	Law No. 0120/A/MINA DT/DPC/CEP/CEA2	Creation, organisation and functioning of the National Platform for DRR.
December 9, 2011	Decree No 2011\408	Disaster management enshrined within the DCP.

Source: Adapted from [15].

the economy. The legislative framework changed after the 1986 Lake Nyos Disaster to address DRM institutions and instruments.

The evidence suggests that Cameroon's legislative profile has been predominantly disaster driven and mostly influenced by hazards/disasters that have occurred in the country. The August 21st 1986 Lake Nyos Disaster prompted Law No. 86/016 of 6 December 1986 that reorganised the DCP. The Yaoundé Nsam Fire Disaster on February 141,998 that arose from the collision of two trains hauling flammable crude oil was responsible for Decree No. 98/031 of 9 March 1998 concerning the organisation of disaster relief and emergency plans. From 1998 to 2001, several fire incidents damaged a lot of commercial property in Cameroon with implications for the survival of numerous businesses. These fire incidents served as trigger for Law No. 2001/182 of 25 July 2001 that reorganised the National Fire Brigade [13,15,31,32].

The huge impact/effects of these hazards/disasters was being experienced in the country for the first time, and not anticipated, prompting policy change with the view to contain them in future. For instance, the Lake Nyos Disaster still holds the record for the highest loss of life from a natural hazard in Cameroon (1,746 deaths) with more than 8300 cattle and 4500 people killed and displaced respectively [9,14]. The Lake Nyos disaster took the Cameroon government by surprise and the relief and rescue operations that ensued was unprecedented and challenging since the country had not anticipated nor planned for such an incident. Likewise, when the Nsam train crash killed around 120 people (flammable crude oil being carried by tankers exploded and also injured several hundreds of people) the country had not experienced a technological hazard of this scale and was unprepared to deal with the aftermath [44], hence the policy change that followed after both incidents. In view of the growing disaster risks in the country [9,16,17,31], Cameroon needs a proactive legislative framework that is informed by regular risk assessments/analysis (see Section 6.1 and Table 4).

6.2. Insights from international DRM platforms/frameworks

Cameroon has signed many regional and international DRM frameworks aimed at protecting its citizens, infrastructure, and environment from disaster risks. To comply with these frameworks, several government

ministries/agencies have published national policy papers and documents committing to mitigate the impact of disasters risks and associated cascading effects that amplify poverty in the country. Table 3 shows a list of the frameworks and associated policy documents from 1994 to 2015.

6.3. DRM institutional structure

Commensurate with international frameworks, the Cameroon government is keen to articulate a multi-agency/disciplinary DRM framework with local, regional, national, and international stakeholders (Fig. 2). Theoretically, the DRM landscape is influenced by various institutions, and bodies like national/local government stakeholders, ministries, national organs, development organisation, international partners and regional/international framework agreements as displayed in Fig. 2.

Official government documents paint an upbeat picture of DRM that is implemented through ministerial/inter-agency cooperation from the national to local level with central coordination and appropriate legislative guidance. As mentioned in Table 2, Decree No.67/LF/9 of 12 June 1967 enshrined the legal responsibility to coordinate and implement DRM activities to the MTAD and Decree No. 2004/320 of 8 December 2004 made CP the second most important function of MTAD—a function that was designated to the Directorate of Civil Protection (DCP) created under MTAD. The DRM legislative provisions seem to fulfil the basic requirements albeit with limitations. Yet, DRM is not explicitly documented in the functions and projects of stakeholder Ministries. This has implications for DRM interventions.

Indeed, empirical evidence suggests that some stakeholder ministries are insufficiently prepared for DRM interventions partly due to lack of clarity on their responsibilities. As such, they do not consider DRM interventions as part of their core responsibility. Hence, their reluctance to budget for risk reduction and response. In such scenarios, when responding to an incident, they render services convenient to them, rather than what they ought to provide [9] or within their competence. For instance, issues of inter-ministerial cooperation, and coordination, information management and the provision of logistical support occurred during the response to Cameroon's worst train crash—the Eseka train disaster [44], which

Table 3

Key DRM platforms/agreements and policy documents in Cameroon.

Framework/Report		Year	Evidence of Action from Cameroon
Framework Report on the Implementation of DRM	IDNDR (Yokohama)	1994	DRM policy/legislative framework
	IDNDR (Cities at Risk)	1994	Media coverage and public awareness campaign
	HFA	2005	Political & institutional commitments for DRM
	GPFDRR	2013	National, regional & International DRM reports
	HFA Report-1	2014	National report on the progress of the HFA
	Prep-Com 2	2014	National, regional & International DRM reports
	AfRP Abuja	2014	Absent
	ICDO	2014	Capacity building for senior DM personnel like Governors, Divisional Officers, & Mayors
	SFDRR	2015	Humanitarian activities due to the influx of refugees in Cameroon
	Sendai Meeting Kick-off	2015	Yaoundé SFDRR Declaration
	ECCAS	2016	Evaluation of SFDRR in ECCAS countries
	GPFDRR	2017	Political commitment to SFDRR
	GPFDRR	2019	Further commitment to a global plan of action for DRR at the sub-regional and regional levels.
	UNDP& UN/OCHA	Continuous	Support capacity building for DRM.
National Policy to Enhance DRM	Poverty Reduction Strategy	2008	Economic and poverty reduction measures to mitigate social vulnerability to disaster risks
	Growth & Employment Strategy	2009	Accelerating economic growth, creating employment opportunities, reducing poverty & assisting to sustain agrarian livelihoods
	Cameroon Vision 2035	2009	Innovative strategies to empower and enhance Cameroon's pollical and economy sectors to greater achievements by 2035
	National Contingency Plan	2011	Emergency management of disasters/risks
	Compendium	2012	Compendium report of CP in Cameroon
	National Climate Change Adaptation Plan	2015	Integration of climate change adaptation into relevant new & existing policies & programmes

Acronyms: IDNDR = International Decade or National Disaster Reduction; HFA = Hyogo Framework for Action; GPFDRR = Global Platform for Disaster Risk Reduction; AfRP = African Regional Platform; ICDO = International Civil Defence Academy; SFDRR = Sendai Framework for Disaster Risk Reduction; UNDP = United Nations Development Program; UN/OCHA = United Nations Office for the Coordination of Humanitarian Affairs.

Source: Adapted from [31].

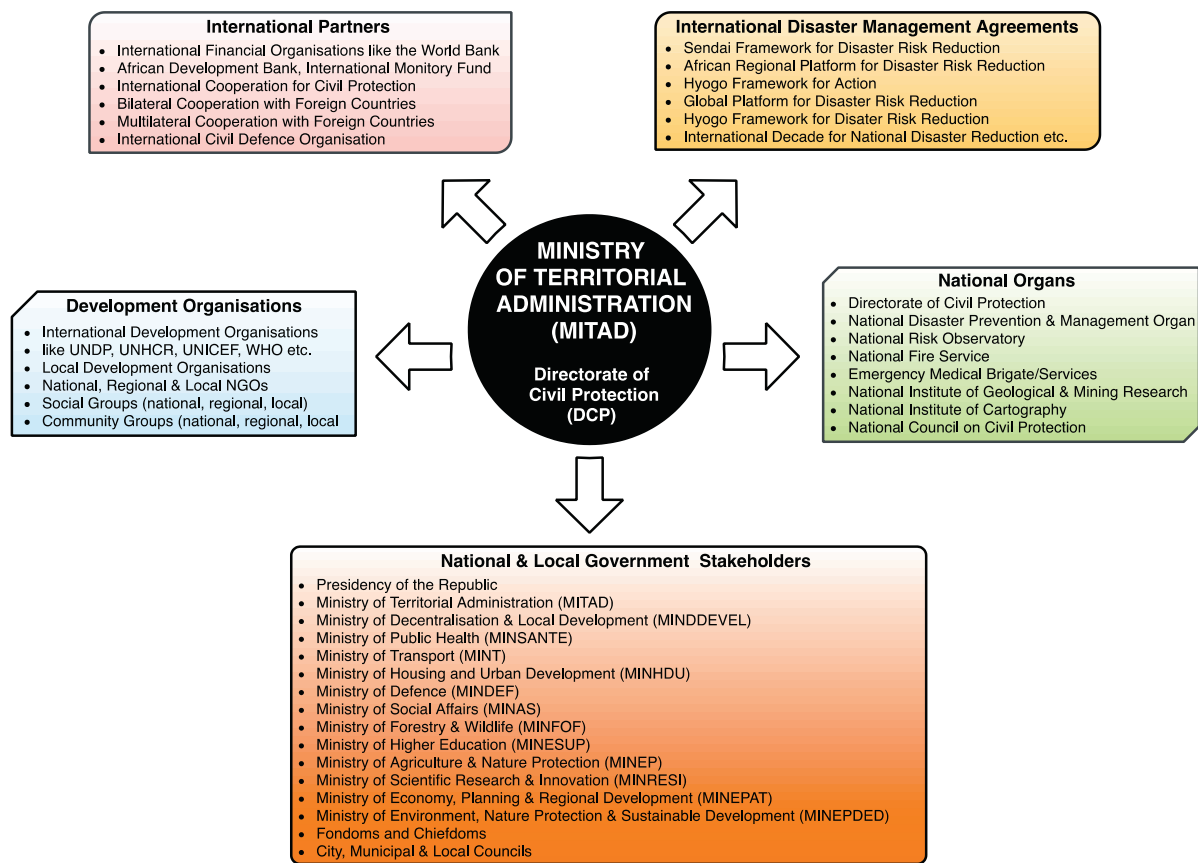


Fig. 2. Cameroon's Institutional Structure for DRM. Source, Adapted from [9].

arguably could be attributed to lack of understanding of the responsibilities of DRM stakeholder ministries.

A recent UN report on DRR for public investment found that only 13 out of 54 of Cameroon's ministries, agencies and departments of the central government have DRM functions, projects, or administrative activities and that only 1.5% (\$68.3 million) of Cameroon's 2019 budget was allocated for significant DRR public investments plans [33]. The various CP acts have limited inclusion of DRR approaches and guidelines for multi-stakeholder involvement, cross-sectoral interventions, and cooperation and there is lack of budgetary provisions and guidelines for the allocation of DRM [14–16]. An updated DRM regulatory structure that addresses these limitations is urgently required, as the recommendations on table 4 show.

6.4. Central DRM coordinating agency—the Directorate of Civil Protection (DCP)

The DCP is the nodal agency in the MTAD that is legally entrusted with the responsibility to organise, coordinate and implement DRM activities throughout the national territory (see Decree No. 2005/104 of 13 April 2005). The principal DRM responsibilities of the DCP are: organisation of CP activities in the country; coordination of CP institutional structures; initiate CP cooperation between national and international organisations; develop CP studies and research in collaboration with other stakeholders; CP capacity building in partnership with other stakeholders; control crisis/disaster operations concerning relief, rescue, and transfer of corpses; facilitate requests for compensation/financial assistance from disaster victims; control financial and material aid meant for disaster victims; coordinate the deployment of back-up and auxiliary services; and to coordinate logistical operations during crisis and/or disasters [15,29,30,34–38]. These functions, enshrined in legislation, makes the DCP the sole coordinator and implementor of DRM policies, legislation and plans in Cameroon

[15,28,31,32]. Furthermore, the national coordinating organs (pilot committee) of the established crisis committee structures have been placed under the coordination of the DCP [39,40]. Research evidence suggests the DCP is determined and enthusiastic to perform its responsibilities, albeit with challenges. The agency has been facilitating the provision of relief operations in all crisis/disasters in the country. Another area where significant contributions have been made is in educating and sensitising the public on DRM issues. Between 2002 and 2010 the DCP published a yearly informative and educative series on the state of CP in Cameroon [15]. Nevertheless, the DCP does not effectively implement most of its legislative DRM responsibilities due to several reasons associated with its limited power/authority and small budget that need addressing (see Section 6.4 and Table 4).

6.5. DRM governance/power structure

Cameroon's DRM governance structure aligns with the political governance fabric of the country and operates under the MTAD. In congruence with the political governance structure, DRM is administered in accordance with the 10 administrative regions in Cameroon (Fig. 3) at the national, regional, and local echelons of government. At the national level is the MTAD (and its DRM agency—the DCP) and other stakeholder government Ministries and national DRM organs located in the nation's capital Yaoundé.

Politically, these and all stakeholder Ministries are directly under the office of the Prime Minister and Presidency of the Republic. Within Cameroon's 10 administrative regions (see Fig. 3), the regional services of the DRM stakeholder Ministries (located in the regional capitals) and City Councils constitute the regional level. The regions are further divided into Divisions—that have Divisional DRM stakeholder Ministries and Municipal Councils. At the tail of the structure are Fondoms/Chiefdoms acting as auxiliaries of the administration that fall within the local level. This top-down administrative structure is shown in Fig. 4.



Fig. 3. Map of Cameroon Showing the 10 Administrative Regions. Source: Author, adapted from Cameroon's National Institute of Statistics.

The administrative heads of the governance structure are political appointees who double as the chief DRM officials in their respective administrative units. At the national level is the Minister of Territorial Administration, at the regional level are the 10 Regional Governors and at the local level are Divisional Officers (senior and junior) and traditional rulers. Other than the traditional rulers, the primary function of these administrators is to govern their various administrative units, extended to incorporate DRM governance. This also represents the political power structure, and consequently that of DRM.

According to Cameroon's DRM legislation, the President of the Republic, together with the Prime Minister, occupy the topmost level of the power structure and have the right to formulate DRM policies at the

national level. DRM organs at the national level like the National Council for Civil Protection (NCCP) also have the power to initiate DRM policies for endorsement by the President of the Republic. The MTAD is a powerful institution at the national level with legislative authority for implementing DRM policies. That function has been delegated to the DCP (which is the permanent secretariat of the NCDC) and liaises with research institutions and regional/international organisations that foster DRM at the national level. The power structure reduces downwards to the governors of the ten regions in the country who are directly under the control of the Minister of

Territorial Administration. Supporting the governors, the power dwindles further down to the Senior Divisional Officers. At the end of the DRM chain, are traditional authorities (Fondoms and Chiefdoms) serving as

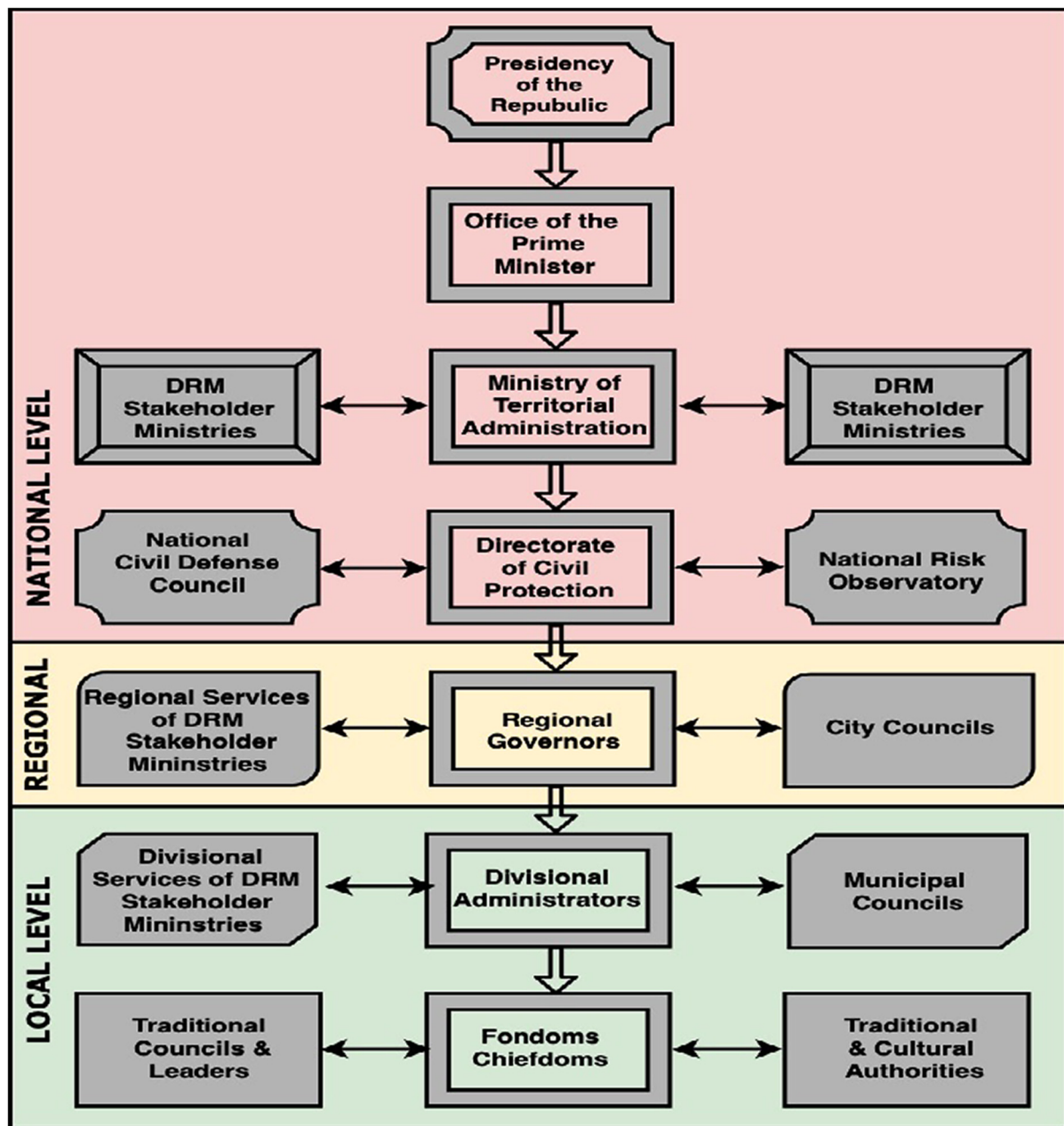


Fig. 4. Administrative and Governance Structure of DRM in Cameroon.

'auxiliaries' of the administration as empowered by decree No. 77/245 of 15 July 1977 organizing the chiefdoms [41] albeit their role as de facto crises/emergency managers is not explicit in DRM legislation. This structure, according to Law No 2004/017 of 22 July 2004 is aimed to decentralise DRM to lower administrative units and the administrators, as custodians of DRM activities in their administrative units, are responsible for implementing and enforcing DRM measures. This top-down structure, nevertheless, is challenging for the effective governance of disaster risks as the gap analysis in Section 6.5 reveals.

6.6. Administrative process for crises management

The crisis management process is in accordance with the devolution of DRM in Cameroon. There is legislative provision for the competent authorities to initiate and implement crisis response in all the different administrative units at all levels. In consequence, the DRM process has legislative provisions specifying the core actions and/or activities that should be

performed at the national, regional, and local levels during a crisis. The responsible DRM authorities may initiate the following actions upon receipt of reliable information of a hazardous incident, or disaster: (1) inform their immediate hierarchy; (2) alert, warn or inform the vulnerable community/populace if necessary; (3) convene an adhoc crisis committee to deal with the incident and/or (4) initiate emergency relief/aid to help the affected population. If the competent authorities encounter an incident that is beyond their ability and capacity to handle, they have to inform their immediate bosses, including an appraisal of the situation and what steps if any has been taken [15,29]. What this entails is that the decision of the competent authorities to engage with the desired measures depends on the scale and intensity/magnitude of the incident. Additionally, the legislative framework enshrines the national crisis committee and the national platform as conspicuous crises management structures with a pilot committee and national coordination platform that has one focal person in each of Cameroon's 10 administrative regions [40]. This process is not without its limitations mentioned in Section 6.6.

7. DRM gap analysis and discussion

7.1. Gap analysis in the evolution of the legislative framework

Cameroon's predominantly disaster response-driven legislative framework does not provide sufficient foresight to anticipate and mitigate emerging and new risks. There is need to shift from this reactionary approach to developing DRM legislation that is based on regular risk assessment. This will better enable resilience to contemporary and burgeoning disaster risks. A proactive strategic policy for developing DRM legislation is required. The 14 ministries assessed to be engaged in DRR activities in 2019 [33] should be legislatively empowered to enhance their DRM profile.

Accessing Cameroon's DRM legislation is challenging. As shown in Table 2, the DRM legislative instruments exists as texts, laws, guidelines, presidential decrees, prime ministerial instructions dispersed across government ministries, and agencies [15,31]. Most documentation is in French, restricting the English-Speaking populace from accessing vital DRM information [9]. The isolated legislative instruments should be assembled in a national legislative document in both of Cameroon's official languages (English and French) to facilitate information acquisition and implementation of DRM measures by all stakeholders.

Despite several revisions and modifications over the years, more emphasis has been placed on emergency preparedness, disaster response and recovery rather than risk reduction measures [11,15,31]. For instance, an analysis of the legislations enacted from 1967 to 2011 (presented in Table 2) reveals that 66.7% (Law No. 67/LF/9 of June 12, 1967; Presidential Decree No.02/CAB/PRC of January 18, 1968; Law No. 71/DF/381 of August 11, 1971; Law No. 86/016 of December 6, 1986; Presidential Instruction No. 005/CAB/PR of August 24, 1987; Decree No. 96/054 of March 12, 1996; Law No.98/015 of July 14, 1998; Law No. 98/147 of July 17, 1998; PM Decision No.037/PM of March 19, 2003; Decree No. 2004/009 of April 24, 2004; Decree No. 2004/320 of December 8, 2004; Decree No. 005/104 of April 13, 2005; Decree No. 2005/327 of September 6, 2005; and Decree No 2011\408 of December 9, 2011) focused on the establishment and coordination of CP activities while 23.8% fall within the domains of rescue (Presidential Instruction No.16/CAB/PRC of September 11,1972), relief (Decree No. 74/199 of March 14, 1974; Decree No. 98/031 of March 9, 1998), aid (Decree No. 2002/018 of January 18, 2002) and emergency services (Law No.2001/182 of July 25, 2001). Just 9.5% can be attributed to DRR related activities (Decree No. 2005/124 of March 15, 2005 and Law No. Law No. 0120/A/MINADT/DPC/CEP/ CEA2 of September 17, 2010). Therefore, a visionary approach of formulating DRM legislative instruments that are more proactive than reactive should be adopted.

7.2. Gap analysis on insights from international DRM platforms

Theoretically, signing up to international DRM frameworks is evidence of Cameroon's commitment to embrace international DRM standards. Practically though, implementation of the DRM instruments is limited. For instance, more than a decade after endorsing Priority Action 1 of the HFA that recommends organised and systematic DRR laws, plans and policies, the legislative framework remains scattered across sectoral/ministerial texts, degrees, ministerial/presidential instructions, and documents [15,31]. DRM activities that require funding and collaboration between Cameroon and international partners are generally carried out to a satisfactory outcome, albeit usually constrained by the latter not completely fulfilling their financial obligations. Heavy reliance on donor funding for DRR investments is constraining. Between 2015 and 2017, donors spent around \$81 million per annum, which is similar to the main DRR investments budgeted in the 2019 financial year [33]. The national DRM policy interventions are rarely achieved or implemented to the fullest. Being able to fulfil its DRM obligations should be a prerogative of stakeholder ministries/agencies. Limited human and financial resources has been mentioned as

the main constraints in achieving DRM objectives [9,15], which calls for adequate DRM funding.

7.3. Gap analysis of the DRM institutions

Cameroon's ambition of a holistic DRM is operationally limited. Contemporary DRM research reveals the national DRM coordinating tools, mechanisms, processes, and structures are not functioning satisfactorily as is being projected and as prescribed by regional and international DRM frameworks. The response to disasters in the past decades have exposed weak cross ministerial/interagency cooperation and coordination. This has been captured in research on the management of contemporary hazards/disasters. For example, management of the Lake Nyos Disaster [42]; dealing with health hazards associated with Mt. Cameroon eruption [43]; responding to the worst flooding in Cameroon/Northern Cameroon for over six decades [13]; management of the recurrent floods and landslides in Limbe [11]; management of the Esekia Train Disaster [44]; dealing with recurrent floods in Douala [45]; and mitigating flood risks in Yaoundé [17]. Consequently, the much-acclaimed multi-sectoral DRM approach is operationally minimal. A DRM legislative and policy appraisal to apportion responsibilities that would facilitate inter-ministerial/agency cooperation and collaboration is urgently required.

Additionally, the DRM operational responsibilities of stakeholder ministries are vague or not adequately addressed [32]. Despite several revisions and modifications since 1967, the various legislative tools, acts, ordinances, and instruments have not appropriately apportioned DRM stakeholder responsibilities. Budgetary allocations or investment for DRR is heavily skewed. For instance, in the tiny 2019 DRR budget, the Ministry of Health (out of 12 institutions with DRR-related activities) had 82% of key DRR investments [33]. Furthermore, linkages between DRM and development planning are yet to be manifested in several sectors. For instance, poor urban planning and development is responsible for the increase in flood risks in Douala, Cameroon's economic capital [45]. The authorities need to conduct awareness campaigns across government that is aimed at institutionalising and mainstreaming DRM into the development process.

7.4. Gap analysis of the strategic functions of the DCP

Operationally, the DCP does not have the authority and financial capacity to implement its functions effectively. The DCP's lack of authority to control other stakeholder ministries has been noted in contemporary empirical research in Cameroon [9,11,14,16,31,40,42] despite its DRM coordination role underpinned by legislation. As an agency under the Ministry of Territorial Administration, the DCP lacks the power and authority to coordinate across stakeholder ministries [9] especially at ministerial level since administratively, the Director of the DCP does not have as much power/influence as that of a Minister. This was manifested during the crisis management of the October 2016 deadly Esekia train crash when the Ministers of some stakeholder ministries ignored the DCP and proceeded to provide rescue services leading to duplication of functions and coordination/cooperation challenges during the rescue operations [44].

The DCP is also partly constrained in the execution of its duties due to issues with resources allocation. Budgetary allocations for the DCP are not explicit in legislation and fall short of what is actually required [15,36,42]. This has often slowed response interventions requiring swift assistance since the DCP has to request for funds from higher authorities to provide relief assistance or aid. For example, the DCP's relief efforts during one of the worst flooding incidents in Cameroon's history (the 2012 floods in northern Cameroon) was slow due to delays in obtaining and providing financial and material assistance to the displaced/affected victims [13].

Furthermore, most of the allocated tasks of the DCP are not legislatively supported and/or tied to appropriate funding or resource allocation. A UN 2019 DRR public investment planning report on Cameroon identified just 2 (0.5%) DRR-related projects (risk, disasters and emergencies response and information management) being performed by the MTAD and consequently the DCP while the remaining 42 projects were budgeted in

stakeholder ministries with the bulk (12, 27.3%) in the Ministry of Scientific Research and Innovation [33]. The much-acclaimed function of coordinating DRM activities is not mentioned. This is not surprising since the DCP is just an agency under the auspices of a Ministry (MTAD).

Realistically, the DPC's role has been relegated to facilitating the provision of relief to disaster victims albeit without adequate funding. In fact, financial support to deliver much needed relief/aid during crisis/disasters is irregular. The agency does not have sufficient funds to assist regional crisis organs respond to crises/disasters [40]. Funds are mobilised from higher authorities after emergencies/crises. Such relief assistance that is provided on an adhoc basis is often insufficient and late to produce the desired impact on disaster victims [9,13].

The DCP's highly applauded education campaign does not have country wide coverage since the rollout of its publications to the regional and local levels is scanty [9,15]. Hence the "at risk" populace lacks basic risk knowledge and the civil society/traditional DRM stakeholders have not been engaged in DRR knowledge creation and decision-making [39]. The government needs to better articulate feasible functions for the DPC. In fact, senior officials of the DCP have suggested that the agency would better actualise its aims and objectives if granted autonomy [9] or placed within the PM's Office or under the Presidency.

7.5. Gap analysis of DRM governance structure

Cameroon's DRM governance is theoretically decentralised from the national to local levels [29] as mentioned earlier and as prescribed by international frameworks. Operationally though, the process is obscured on several fronts and centralised. The centralised and bureaucratic governance structure is clearly manifested with the designation of the DCP as the sole implementer of DRM in Cameroon. There is minimal involvement of multiple stakeholders in national platforms where DRM policies/plans are developed. DRM policy and legislative matters are crafted at the national level with minimal local level/community and civil society involvement [15,16,42]. Interestingly, the government has acknowledged the minimal involvement of professions/technocrats from the Anglophone regions in the national DRM development process [46].

Wide gaps exist between national and local level governance of disaster risks. The devolution of power to implement DRM activities to lower administrative units is an illusion. Realistically, the delegation of authority, responsibility, and competencies, including resources (human, material financial) to lower administrative levels is restricted. Indeed, lower administrative structures are powerless to initiate and/or implement DRM activities without authorisation from higher authorities [9,16]. This is exacerbated by the fact that local-level DRM implementation is not empowered financially to effectively perform their designated functions. Consequently, the local authorities rely on the higher echelons of the DRM process for assistance. Since local communities are hit hardest by disaster risks, their inability to significantly influence DRM processes at the community level is concerning. This set up undermines the local governance of disaster risks. Empowering local authorities to enhance local-level DRM interventions should be a government priority [40].

7.6. A gap analysis of the administrative process for crises management

At face value, the decentralised crises management process will enhance crises response. In reality, the process represents a top-down hierarchical structure that is detrimental to crisis response when swift decision making, and action are required to minimise loss of life. The reason being that response institutions at the lowest levels are not sufficiently empowered with the authority and funds to effectively respond to crisis. Consequently, operationally, it has become a norm for authorities at the local level to seek assistance from the higher echelons of government during crises/disasters due to limited resources. In most crisis situations, the DCP has to request for funding from the Prime Minister's Office or

Presidency to deal with the situation [9,13]. Such referrals are a normal practice all over the country even for minor incidents requiring relief aid or material, and financial support to victims. By default, adhoc decisions are taken at the highest levels of government to finance most hazardous/crisis incidents requiring relief operations. Inadequate DRM funding undermines the documented decentralised crises response process that is aimed at rapid response to save lives and minimise sufferings from disasters. It is unlikely that this trend will stop soon since recent allocations of DRM budgets has focused more on disaster mitigation/prevention than relief [33].

The identified gaps are preventing Cameroon's DRM policy, institutional, legislative, administrative and governance/power structures from attaining their full potential. The gap analysis can enable Cameroon to identify problems, adapt services, plan more strategically and/or change its DRM structures or processes to better align on strategic goals as demanded by international DM frameworks.

8. Closing the identified DRM gaps and/or recommendations

A summary of the identified gaps, and the corresponding recommendations on how they can be closed or mitigated are presented in table 4 below.

DRM frames	Identified gaps	Closing the gaps or recommendation
Legislative Framework	<ol style="list-style-type: none"> 1. The legislative profile for DRM has been mostly disaster driven 2. Predominantly reactionary approach to developing DRM legislation. 3. Accessing DRM legislation is challenging since it is scattered in several documents and across several institutions. 4. Most DRM legislative documents are in French. 5. The DRM functions of most stakeholder ministries are not mentioned or explicit. 6. Past legislative changes emphasised disaster preparedness and response more. 	<ol style="list-style-type: none"> 1. Regular natural hazard/disaster risk analysis should determine the DRM legislative profile. 2. A shift to proactive or anticipatory approach to developing DRM legislation is required. 3. DRM legislation should be assembled into a national legislative document that is regularly updated. This will also be more accessible. 4. DRM documentation should be in Cameroon's official languages (French and English). 5. The DRM functions of stakeholder ministries or agencies should be documented. 6. Contemporary focus should be on disaster risk reduction measures.
Membership of International DRM Platforms	<ol style="list-style-type: none"> 1. Compliance with international DRM frameworks is limited. 2. Rushing to sign or engage in many DRM platforms gives a false impression of compliance. 3. Often, more effort is made to fulfil DRM obligations involving joined projects with external partners. 	<ol style="list-style-type: none"> 1. The government should set milestones in compliance with international frameworks. 2. There is need to be more selective engagement with DRM framework where there is a higher probability of compliance. 3. Locally conceived projects should be taken as seriously as other projects jointly executed with external partners.
DRM Institutional Structure	<ol style="list-style-type: none"> 1. National DRM structures are not sufficiently empowered. 2. DRM multiagency cooperation is weak. 3. Most stakeholder ministries do not recognise the DRM coordinating bodies. 	<ol style="list-style-type: none"> 1. National DRM bodies should be empowered with the required resources. 2. Multiagency cooperation needs strengthening. 3. Stakeholder ministries should be educated to respect DRM coordinating

(continued)

DRM frames	Identified gaps	Closing the gaps or recommendation
Directorate of Civil Protection (DCP)	4. Mainstreaming DRM into the national budget is very limited.	institutions.
	5. Stakeholder DRR investment budgets allocation is skewed to a few ministries.	4. More key DRM programs/activities should be inculcated into the national budget.
	6. Most country wide development activities do not incorporate DRR considerations.	5. Allocation of DRR investment budget should target all relevant ministries and be fairer.
	1. The DCP lacks authority to coordinate DRM across stakeholder ministries.	6. DRR should be mainstreamed in development planning.
	2. Operating under the MTAD, the DCP is not empowered to execute its functions over stakeholder ministries.	1. The DCP should be accorded more/special powers to affect its coordinating functions.
	3. National public investment budgeting does not incorporate the coordinating and other functions of the DCP.	2. The DCP will function better as an autonomous body or if placed above ministerial level.
	4. The budget of the DCP is not enough to perform its coordinating function.	3. To enhance its functions, national investment planning should allocate funds to the activities of the DCP.
	5. The DCP's effort to sensitise the populace on disaster risks has limited outreach.	4. The DCP's budget should be regularly reviewed to suit its dynamic functions.
	6. The DCP is not using enough sources to educate the populace on disaster risks.	5. The DCP should ensure its publications are available at the regional/local levels.
DRM Governance/Power Structure	7. Funding for relief assistance during crises is often requested from higher authorities.	6. Multiple channels should be consistently used to sensitise the public on DRM issues.
	8. The DCP is the sole implementer of DRM in Cameroon.	7. Rapid relief assistance is only possible if the DPC has its own emergency relief budget.
	9. The DCP does not have expertise to execute all its legislative duties.	8. Stakeholder ministries are more suited to implement DRM activities of their expertise.
	1. The main disaster managers are political appointees or heads of the administrative units without DM knowledge.	9. The DCP's duties should be reviewed to align with what the agency can feasibly achieve.
	2. Theoretically, there is devolved DRM governance albeit that is not the case.	1. Disaster management professionals should be appointed to work alongside the administrative heads of the regions.
	3. DRM policy development involves mostly national level stakeholders and organs.	2. There should be more devolution of powers to regional and local DRM authorities/units.
	4. Regional representation of DRM policy building is dominated by Francophones from a few regions.	3. Local stakeholders should be more involved in the crafting of DRM policies and plans.
	5. Resources and capability/ability for DRM interventions are skewed towards the national level.	4. More technocrats from the Anglophone regions should be involved in the DRM development process.
	6. The role of traditional rulers as de facto crises/emergency managers is not explicit in DRM legislation.	5. Local stakeholders should be empowered in resources (human/financial) and politically to enhance their DRM interventions.
		6. Considering traditional rulers are highly respected

(continued)

DRM frames	Identified gaps	Closing the gaps or recommendation
Administrative Process for Crises Management	1. Theoretically, the crises response process is decentralised but stakeholder at the local levels have limited DRM interventions.	by their subjects, DRM legislation should address their DM responsibilities.
	2. Operationally, there is a dominant top-down hierarchical structure for crises management or response.	1. Local administrators should be empowered to operationalise DRM activities without always relying on assistance from the national level.
	3. Most legislative provisions for crises management/response are not favourable to community/local DRM stakeholders.	2. More reception of community/local-level DRM ideas and enhanced response capacity is beneficial for crises management.
	4. Legislatively, crises or disaster response interventions can be done at the national, regional, and local levels.	3. Crises management legislative provisions should be reviewed to ensure they can be operational in local administrative units.
	5. Response to most crises incidents involve national level adhoc decisions that provides financial assistance.	4. To actualise this provision, lower DRM administrators should be provided with the required resources.
		5. Disaster response budgeting at lower administrative units will minimise reliance on higher DRM levels for interventions.

9. Conclusion

This article has elaborated on Cameroon's DRM frameworks by providing insights into various DRM components and analysing their operational suitability or lack thereof to mitigate the growing disaster risks. This aligns with the standards set by the SFDRR that requires countries to regularly review and improve their national DRM frameworks. The analysis reveals that Cameroon's DRM frames has the basic components. Nevertheless, a gap analysis has exposed the suboptimal performance of contemporary DRM frameworks. To enhance or achieve their full potential in alleviating Cameroon's growing disaster risks, recommendations have been proffered on the need to review the current DRM frameworks in light of identified gaps.

This article has demonstrated that DRM legislation can be a powerful tool for mitigating existing disaster risks, establishing DRM mandates, recognising, and facilitating the involvement, functions, and responsibilities of DRM stakeholders. Hence, a risk-informed legal framework has been underscored. The need for greater investment in DRR and autonomous funding for rapid intervention or relief assistance during crises has been established. More involvement of local communities/stakeholders in the DRM process, supported with the appropriate resources is encouraged. The analysis supports practical devolution of power to lower authorities that hinges on appropriate support and adopting a proactive DRM approach. Furthermore, engaging representative civil society groups all over the country and mainstreaming DRR into the development planning process are vital to achieve Cameroon's DRM and development goals. Of crucial importance is the proposal that the DCP be made autonomous or elevated above ministerial level.

This article provides an opportunity for Cameroon to review and fully engage DRM as prescribed by the regional and international platforms. To realise its vision of a newly industrialised nation by 2035, Cameroon has to place DRM at the core of her development project decision-making since disaster risks can easily set back development gains. Abiding by the recommendations would have a profound impact on Cameroon's ability to mitigate, cope with, resist, and respond more effectively to disasters/

crises. Potent DRM frameworks to manage and mitigate risks will underpin efforts to combat the rising disaster risks in Cameroon. This paper presents the evidence base to inform a review, revision, or complete overhaul of Cameroon's DRM frameworks.

This article makes a major contribution by providing analytical and practical/operational insights on DRM frameworks in Cameroon. It enhances literature in the field and provides practical DRM recommendations to governments, authorities/officials, and disaster managers including support for relevant and official DRM legislative drafters, practitioners, policy makers and implementers. Additionally, the ideas in this article could help generate a more informed DRM structured debates/discussion at the national and local levels relevant for sustained development. Hopefully, this would lead to a renewed focus on reviewing and enhancing the DRM frameworks for more effective risk reduction. Finally, this paper would inform the DRM knowledge of academics, researchers, and students.

Declaration of Competing Interest

This is a sole-author research/article on Cameroon's disaster risk management frameworks. The author declare that there is no conflicting interest in publishing this paper.

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