

---

ARTÍCULOS / ARTICLES

---

## UNDERSTANDING AND REDUCING CLIMATE RISKS: THE IMPACT OF INNOVATIVE POLICIES FOR SUSTAINABLE DROUGHT RESPONSE IN CABO VERDE

**Carlos Germano Ferreira Costa**

Ministério da Ciência, Tecnologia, Inovações e Comunicações, Comissão Interministerial de Mudança Global do Clima.

Technical Consultant.

[carloscostainspira@gmail.com](mailto:carloscostainspira@gmail.com)

ORCID iD: <https://orcid.org/0000-0003-0280-7281>

Recibido: 05/03/2019; Aceptado: 23/12/2019.

**Cómo citar este artículo/Citation:** Ferreira Costa, Carlos Germano (2020). Understanding and Reducing Risks: The Impact of Innovative Policies for Sustainable Drought Response in Cabo Verde. *Estudios Geográficos*, 81 (288), e033. <https://doi.org/10.3989/estgeogr.202048.028>

**ABSTRACT:** The Sahel has experienced severe drought conditions since the 1970s, whereas in West Africa extreme droughts have occurred more frequently in recent years. Drought is the most relevant hazard in Cabo Verde in terms of economic losses. This archipelagic country experiences extreme drought conditions regularly with particular impact on the agricultural sector. Although climate variability is a significant source of risk, the impact of drought on agriculture and society does not only depend on the inherent hydrometeorological characteristics of a region, but also the levels of exposure and the vulnerability of people, political, and agricultural systems. In this regard, and in light of global changes, the understanding of emerging political perspectives to deal with climate-related risks is essential to benefit planning and decision-making processes. In this qualitative descriptive research, we seek to provide policymakers and civil society with an up-to-date outline of crucial developments and factors that links disaster reduction and climate change adaptation mainstreaming into development. The study considers Cabo Verde, with particular emphasis on the 2017-18 drought emergency response. It seeks to discuss the observed impacts of climate change on territorial development, as it provides the basis for understanding innovative approaches for drought risk and supporting activities towards drought risk reduction, aimed at increasing the Disaster Risk Reduction knowledge base by capturing issues that have emerged from national efforts making sure they inform international processes in order to enable climate-resilient pathways.

**KEYWORDS:** SAHEL; Small Island Development States (SIDS); Risk Governance; Social Impacts & Social Resilience; Disaster Risk Reduction (DRR)

## COMPRENDIENDO Y REDUCIENDO LOS RIESGOS CLIMÁTICOS: EL IMPACTO DE POLÍTICAS INNOVADORAS PARA UNA RESPUESTA SOSTENIBLE A LAS SEQUÍAS EN CABO VERDE

**RESUMEN:** El Sahel ha experimentado graves condiciones de sequía desde la década de 1970, mientras que en África Occidental las sequías extremas se han producido con mayor frecuencia en los últimos años. La sequía es el peligro más relevante en Cabo Verde en términos de pérdidas económicas. Este país archipelágico experimenta condiciones de sequía extrema de manera regular con un impacto particular en el sector agrícola. Aunque la variabilidad climática sea una fuente importante de riesgo, el impacto de la sequía en la agricultura y en la sociedad no solo depende de las características hidrometeorológicas inherentes de una región, sino también de los niveles de exposición y de la vulnerabilidad de las personas, de los sistemas políticos, y agrícolas. En ese sentido, y a la luz de los cambios globales, la comprensión de perspectivas políticas emergentes, para hacer frente a los riesgos relacionados con el clima, son esenciales para beneficiar la planificación y los procesos de toma de decisión. En esta investigación descriptiva de carácter cualitativo buscamos proporcionar a los responsables políticos y a la sociedad civil un esquema actual de desarrollos y factores cruciales que vinculan la reducción de desastres y la integración de la adaptación al cambio climático al desarrollo. Tomamos en consideración Cabo Verde, con especial énfasis en la respuesta de emergencia de sequía entre 2017-18, para discutir los impactos observados del cambio climático en el desarrollo territorial, ya que proporciona la base para comprender enfoques innovadores para analizar los impactos de las sequías y apoyar actividades para la Reducción de Riesgos de Desastres (RRD), al capturar la evolución de los esfuerzos nacionales, asegurando que informan procesos internacionales, a fin de permitir vías resilientes al clima.

**PALABRAS CLAVE:** SAHEL; Pequeños Estados Insulares en Desarrollo (PEID); Gobernanza de Riesgos; Impactos Sociales y Resiliencia Social; Gestión para la Reducción de Riesgos de Desastres (RRD)

Copyright: © 2020 CSIC. Este es un artículo de acceso abierto distribuido bajo los términos de la licencia de uso y distribución Creative Commons Reconocimiento 4.0 Internacional (CC BY 4.0).

## INTRODUCTION

Climate change is expected to increase the magnitude and frequency of hydrometeorological hazards in the Sahel and Small Island Development States (SIDS) – including tropical storms, hurricane activity, and droughts – negatively affecting economic growth and development (IPCC, 2013, 2014, 2014a, 2018; Carabine *et al.*, 2014, p4). In this regard, adaptation and enhanced climate resilience in both sub-regions requires a better understanding of climate change adaptation and disaster management processes to effectively mainstream, into policies, programs, and practices innovative, tailored approaches.

Developing countries are the most vulnerable to climate change impacts because they have fewer social, technological, and financial resources to adapt. However, we need to keep in mind that both developed and developing countries alike are already suffering significant impacts of global environmental changes (Miyan, 2015, p3). The world no longer has to wait for the next decades to experience climate change effects. They are here, and they are real. Vulnerable populations are already seeing the consequences of man-made global warming increasing the risks associated with long-lasting or irreversible changes, such as the loss of natural and man-made ecosystems, forced migration, more extreme weather, rising sea levels, and diminishing Arctic sea ice, among others (IPCC, 2018; Chatzopoulos, Domínguez, Zampieri, and Toreti, 2019, p1). Billions of people, particularly those in developing countries, already face shortages of water and food, and more significant risks to health, assets, forced migration, and life as a result of climate change, and climate-driven conflict (Kummu, *et al.*, 2016; Boratynska and Huseynov, 2017; Caniato, Carliez, and Thulstrup, 2017; FAO/IFAD/UNICEF/WFP/WHO, 2017; UNESCO, 2018).

As a Sahelian country as well as a SIDS, Cabo Verde presents itself as an excellent case study to analyze key-factors that pose critical challenges to governance and political systems in the search for climate-resilient pathways, since the country combines several vulnerability and exposure factors. In this regard, we address essential developments and factors emerged during the 2017-18 countrywide drought event, to link disaster reduction and climate change adaptation mainstreaming into development in the Sahel and SIDS, based on the assessment of the Cabo Verde national drought response framework (GoCV/MAHOT, 2013;

GoCV, 2014/2015; GoCV, 2017; GFDRR, 2017). The Region, and the country, are frequently exposed to agrometeorological drought and presents high vulnerabilities to geophysical and climate anomalies and, eventually, to ongoing global changes (GoCV, 2014/2015; GoCV, 2017; GFDRR, 2017). Despite unusual favorable weather forecasts for the 2017-18 period, the local weather has evolved accordingly to recent historical trends (Dai, 2011; Sheffield, Wood, and Roderrick, 2012; Masih, Maskey, Mussá, and Trambauer, 2014; Adeyeri *et al.*, 2017; Adeyeri, Ishola, and Okogbue, 2019; Attogouinon, Lawin, M'Po, and Houngue, 2017; Abiodun *et al.*, 2017; EM-DAT, 2018), further exposing the Region to the risks of agrometeorological extremes and recurrent droughts. As per Cabo Verde, the combination of previous disasters events with the 2017-18 drought, had a tremendous direct impact on the economy, society, and environment as a whole, affecting around one-third of households.

On this subject, this study relies on the Mainstreaming Adaptation and Disaster Reduction into Development (MADRiD) program methodology (UNISDR, 2013; 2013a). The primary objective of this study is to analyze and discuss gathered information from the official government response and governance framework created to support the 2017-18 drought emergency in Cabo Verde as an example of innovative regional adaptation practice. We seek to inform processes of decision making at different scales oriented towards actions (a) to reduce human-induced climate change and its impacts, as well as actions (b) to identify effective institutions, strategies, and choices for risk management to sustain the sustainable development gains already achieved in recent years.

## MATERIAL AND METHODS

### Data and Methods

The paper presents secondary research focusing on a country in the confluence of the Sahel Sub-Region and SIDS, in West Africa. In this sense, it is essential to draw attention to the complexities of analyzing countries grouped in different Regions that present high levels of socioeconomic, market, fiscal, and environmental diversity. For Africa, many regional studies are focused on the Sahel Sub-Region and the SIDS, individually. There is little literature crossing the analysis between these two Regions, which share each a lopsided amount of challenges and risks in the search

for climate-resilient development. Cabo Verde, being at the confluence of the Sahelian region, and presenting archipelagic territoriality, is at a unique position to support the contextualization of the critical role of climate adaptation into development in the developing world. Besides, as the human impact of climate-related events – especially drought events – are challenging to quantify. Studies on this matter are undoubtedly needed, notably to support the reporting of political aspects related to the achievement of SDG target indicators (UNISDR, 2019).

The paper presents qualitative descriptive approach relying on data and information from Cabo Verde official government sources regarding the drought response and the disaster risk governance framework created to support the 2017-18 drought emergency, especially addressing the Inter-Ministerial Task Force – named the Technical Steering Team (ETP) – This structure was created to manage the drought emergency response nationwide. The paper bases its analysis on the integration of multi-level climate change adaptation policies, to analyze the shifting elements underlying assumptions in the historical national drought response. Methodologically, the research relies on the method of data and text analysis as an essential approach comparing information from different sources gathered from more than 100 individual journals and search engines, donor reports and international organization's reports (GFDRR, IPCC, OCHA, WHO, WMO, WORLD BANK, UN-OHRLS, UNISDR), after initially skimming over 300 articles from relevant international journals, in a attempt to give visibility to a broad range of environmental, social, and comprehensive territorial characterization of Cabo Verde. Notwithstanding, the list of reviewed material is not exhaustive, though an effort has been made to conduct a wide-range coverage, based on available information.

This study relies on Components 1 and 2 of the Mainstreaming Adaptation and Disaster Reduction into Development (MADRiD)<sup>1</sup> program methodology (UNISDR, 2013). It calls attention to the necessity of increasing high-level political commitment for integrating Disaster Risk Reduction and Climate Change Adaptation into overall economic and social planning processes; and to promote the establishment of sustained human resources capacity development to successfully advocate for the integration of risk reduction and climate change adaptation into socio-economic development planning and emergency life cycle. In this sense, the analysis is based on an

emergency program created for response and mitigation of a severe drought happening in the 2017-18 period –accompanied from cumulative impacts of droughts events since 2013 –, in a West African country, Cabo Verde. Particular references to other countries, in a given region, are made wherever deemed necessary.

Constrained by limited official information and data, an extensive search of the academic and grey literature was undertaken to include social, fiscal, and economic aspects of vulnerability and resilience in Sahel and SIDS. While the research had a national and sub-national scope; the paper presents the analysis and discussion in the regional, continental, and global perspectives when necessary. The present study asseverates that the understanding gained from a detailed analysis of ongoing disaster and emergency events, as well as Government, civil society, and stakeholders' response and behavior, offers enormous possibilities to carry out better risk reduction and disaster management planning. The knowledge generated might be helpful to shed some light on innovations happening locally in the developing world in order to replicate and even upscale actions to adapt to future impacts of natural hazards and human-induced hazards regionally, as well as to identify adaptation and disaster reduction mainstreaming opportunities into development, as a manner to enable climate-resilient pathways globally.

Furthermore, we assessed the Global Facility for Disaster Risk Reduction (GFDRR) database and government information to present recent drought events in the country, to provided country-level estimates on drought events, people killed and affected and economic damage to substantiate the findings of this study. Additionally, the research depicted the situation in the country and put the national government response into context. Then, the set of tools and procedures, based on the framework followed two conceptual models commonly used by national, regional and global mechanisms: (i) Risk = f (Hazard, Vulnerability); and, (ii) Sustainable Livelihoods Framework, to frame the nature and severity of current and projected drought situation, based on international criteria. This approach served as an integrated analytical framework built on a scientific consensus to make the best use of secondary data from official government agricultural surveys and market monitoring – namely food consumption surveys, nutrition surveys, the Household Economy Approach (HEA).

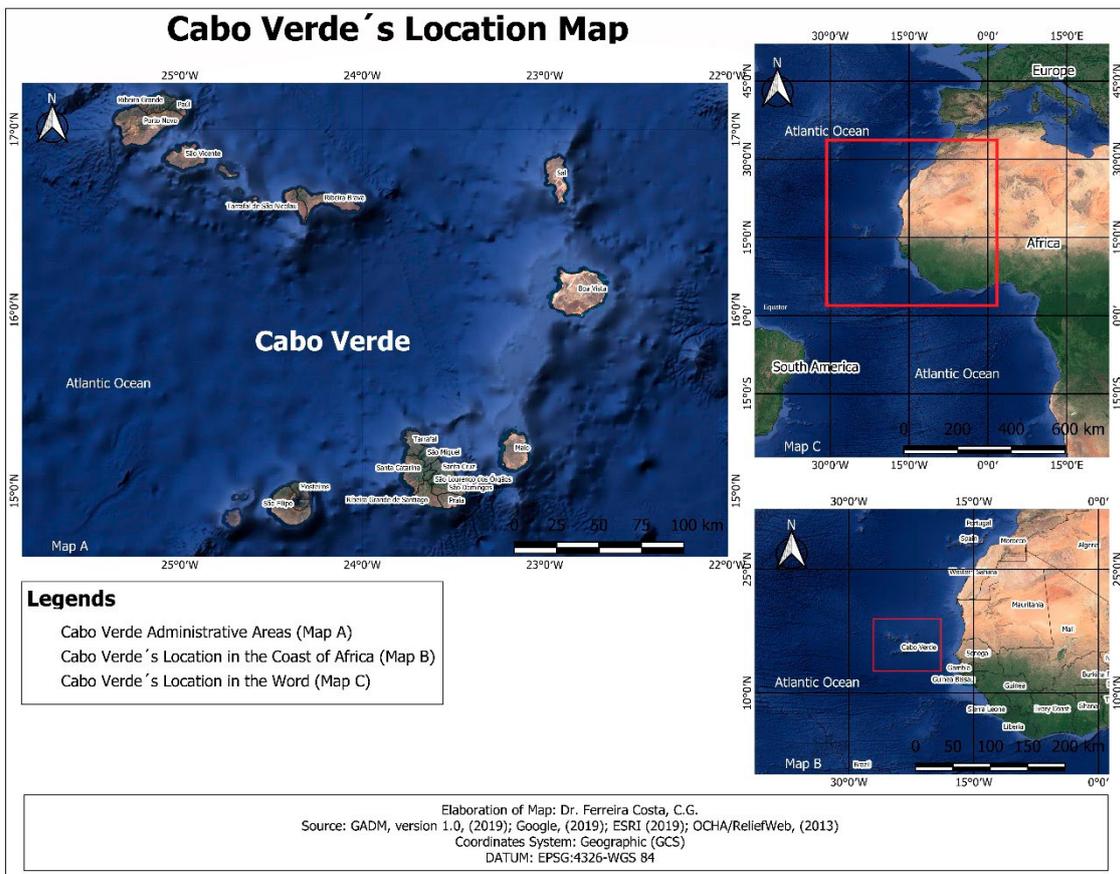
**DISCUSSION**

**Context and Study Area**

This study focuses on a Sahelian archipelagic country, Cabo Verde. A lower-middle-income country located in the Sub-Saharan Africa, with a population of 543,767.00 people (2018), and rising population density (134.9 people per sq. km of land area in 2018), with a sustained annual population growth of 1,2% (1,9% when considering urban population growth), between 2015-18 (World Bank, 2019). According to the most recent Government estimates, Cabo Verde’s Gross National Income (GNI) per capita reached current USD 3,450.00, in 2018, and its absolute poverty line reached 35% of the population in 2015 (World Bank, 2019). Moreover, Cabo Verde is at the confluence of two sub-regions marked by high exposure to risks and vulnerability – the Sahel and SIDS (Figure 1).

As a member of the Sahel, it presents peculiarities marked by low rates of human development, recurrent drought, high food prices, and market distortions (Bora, Ceccacci, Delgado, and Townsend, 2011; Algal, 2011; Simon, Mattelaer, Hadfield, and Morin, 2012; Couttenier and Soubeyran, 2013; Hendrix, 2014; Porkka, Gerten, Schaphoff, Siebert, and Kummu, 2016; FAO/IFAD/UNICEF/WFP/WHO, 2017). All recent decades, commenced in the early 1970s, have witnessed reports on drought, which is seen by many authors to be both widespread and persistent, having a significant impact on development (Agnew and Chappel, 2000; Hall *et al.*, 2014; Masih, Maskey, Mussá, and Trambauer, 2014; Miyan, 2015). Furthermore, a combination of factors including violent extremism, abject poverty, demographic explosion, high food prices, low agricultural production, as well as the inability of affected households to recover from the incessant and recurrent food and nutrition crisis, usually exacerbates the

FIGURE 1  
CABO VERDE’S LOCATION MAP



Source: QGIS software -version 3.3.4-Madeira, (2019).

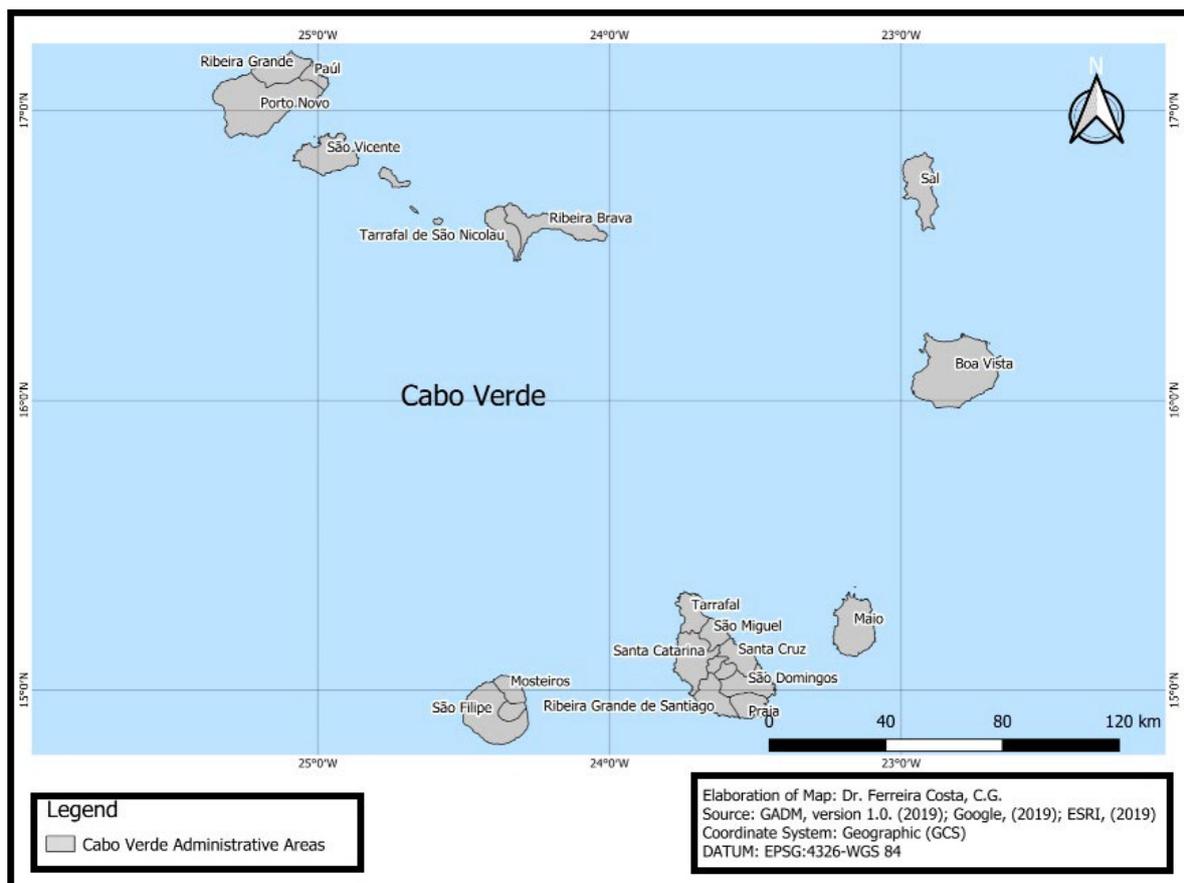
Region’s socioeconomic vulnerability, posing immense challenges for 150 million people across the Sahel (Bora *et al.*, 2011; Porkka *et al.*, 2016; OCHA, 2013; 2017; 2018). In this sense, conflict and drought are the primary drivers working in tandem to usually leave more than 23 million people food insecure in West Africa (OCHA, 2017; 2018). As for June-August 2018 over 10.6 million people were in phase Crisis and above (Cadre Harmonisé phase 3, 4 and 5) of the projected food insecurity situation in the Sahel and West Africa (CILSS, 2017; FAO/ECA, 2018; FAO, 2018). In Cabo Verde alone, estimates showed 68,810 people facing different levels of food and nutrition deprivation in 2017, with a worst-case scenario of 139,000 people affected by the end of 2018 (GoCV/FAO/CILSS, 2017; GoCV, 2017/2018).

Cabo Verde, as a country in the mid-Atlantic, with a surface area of 4,030.00 sq.km, made up of ten

islands and nine islets, is located between latitudes 14° 28’ N and 17° 12’ N and longitudes 22° 40’ W and 25° 22’ W, 600 km far from the Senegal coast in West Africa (Figure 2) (GoCV, 2007).

As a SIDS, it shares disproportionate challenges for sustainable development and heightened vulnerabilities for natural and environmental events. On top of that, a wide range of natural disasters, market, fiscal, and socioeconomic asymmetries expose the country to highly probable global changes, which threaten the population and the country’s long-term economic growth and resilient development. In recent years, Cabo Verde has suffered from: (i) extreme rainfall events that have led to several floods across the country including those in São Nicolau (2009), Boavista (2012), São Miguel (2013, with damages estimated at 2.6 million USD), and Santo Antão (2016, with damages estimated at 7 million USD) (GoCV, 2016); (ii) a

FIGURE 2  
CABO VERDE ADMINISTRATIVE AREAS



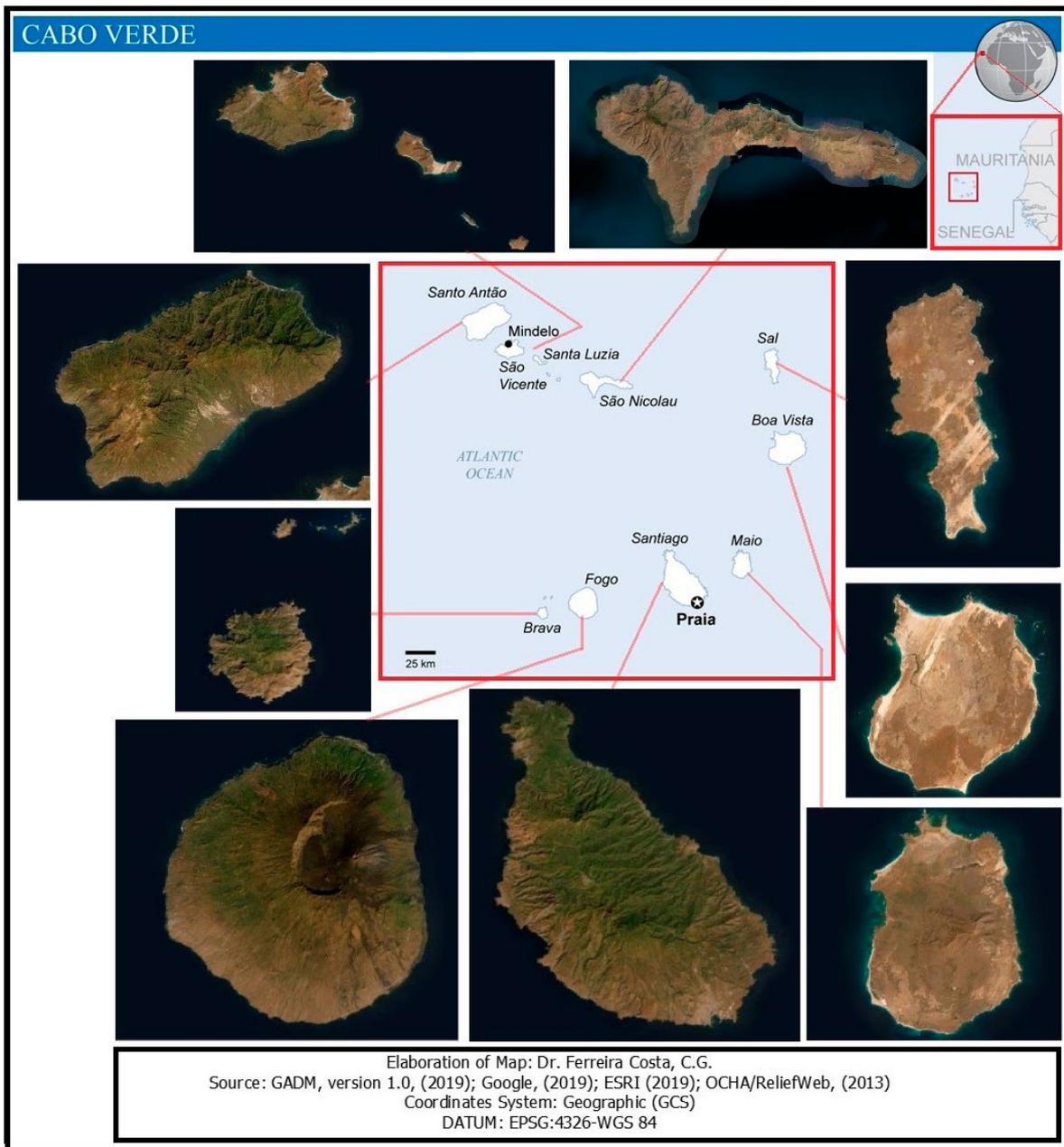
Source: QGIS software -version 3.3.4-Madeira, (2019).

volcanic eruption in 2014-15, in the island of “Fogo”, which displaced all 994 people living in the caldera, and resulted in damages and losses estimated at US\$ 28 million, mainly affecting the agricultural sector; (iii) hurricane Fred, in 2015, which caused damages estimated at 2.5 million USD; and finally, (iv) an intense drought event in 2017-18 that might have af-

ected up to 70,000 people (13 percent of the population), according to Government’s estimates (Escudero and Reid, 2018; GFDRR, 2017).

Cabo Verde, an archipelagic country of volcanic origin in the Sahel sub-region (Figure 3), is characterized by a dry tropical climate with two distinct climatic

FIGURE 3  
ISLANDS OF CABO VERDE AND LAND COVER



Source: QGIS software -version 3.3.4-Madeira, (2019); OCHA/ReliefWeb, (2013).

seasons – a long dry season and an erratic temporal and spatially concentrated rainy season.

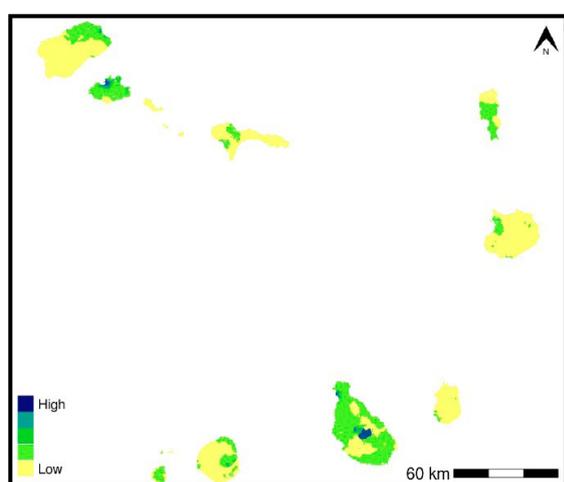
The country presents a sensitive environmental system with a high degree of fragility and vulnerability in front of the occurrence of extreme natural phenomena, especially the high likelihood of droughts between November and June. From its total area, only 908,8 sq. km are forest area, and only 2,6% of its terrestrial and marine areas are under protection (WB, 2019). Moreover, the relatively high population density in some islands (almost half of the population

–236,000 people –, live on the main island, Santiago; and, about 25% of the population lives in the capital city, Praia), 35% of its population living in rural areas (Figure 4); the inadequacy of infrastructure and limited institutional capacity, as well as lack of natural resources, work in tandem to increase the impacts of recurrent drought events in large portions of the territory (GoCV, 2007; GoCV/MAHOT, 2013).

Since the 1970s, Cabo Verde –as well as the whole of the Sahel –, has reported several episodes of drought. For Cabo Verde, the registers indicate that the main events occurred between 1968 and 1973, followed by an extreme drought event in 1977, soon surpassed by even stronger drought events between 1981 and 1983 –when the recorded precipitation levels were 50 to 70% lower than the median precipitation of the previous period (1941-90). Even in the face of so many different types of disaster events, as previously commented by Escudero and Reid, (2018), and GFDRR (2017), droughts represent the most frequent type of event historically affecting the agricultural sector and society in the archipelago (EM-DAT Cabo Verde, 2018). Table 1 summarizes the most recent hydrometeorological events demonstrating how concentrated torrential rains and recurrent wide-range drought events damages and affected people (2009-2018).

The impacts of droughts and extreme temperatures are commonly poorly reported, especially from low and lower-middle-income countries as it is the case of Cabo Verde. The country and similar regions are usually suffering long-term impacts on the stable availability, access and utilization of secure food and

FIGURE 4  
THE SPATIAL DISTRIBUTION OF POPULATION IN RURAL AREAS IN CABO VERDE



Source: WorldPop, (2018).

TABLE 1  
RECENT HYDROMETEREOLOGICAL EVENTS IN CABO VERDE WITH ESTIMATED DAMAGES AND AFFECTED PEOPLE (2009-2018)

Year	Type of Event	Hazard Event	Location	Estimated Damages (USD)	Affected People
2009	Hydrological	Flood	São Nicolau	2.6 Million	
2012	Hydrological	Flood	Boa Vista		
2013	Hydrological	Flood	São Miguel		
2013/2014	Climatological	Drought	Santo Antão, Santiago, Fogo	No assessment conducted to quantify damage and losses.	
2015	Metereological	Storm	Countrywide	2.5 Million	
2016	Hydrological	Flood	Santo Antão	7 Million	
2015/2016	Climatological	Drought	Santo Antão, Santiago, Fogo	No assessment conducted to quantify damage and losses.	
2017-18	Climatological	Drought	Countrywide (Santiago, Santo Antão)	No assessment conducted to quantify damage and losses.	68.810 to 139.000

Source: Adapted from Escudero and Reid, 2018; GoCV, 2014/2015; 2017; GFDRR, 2017.

nutrition, as a result of continued disruption of agricultural livelihoods and food production (Caniato *et al.*, 2017; UNISDR, 2019; Chatzoupolous *et al.*, 2019). Notwithstanding, the lack of precise information on the real effects of disasters events on food security and nutrition, on the social tissue and the overall national economy has been affecting the national capacity to address humanitarian and development needs, as well as the capacity of affected populations to full recover from recurrent events. As per Cabo Verde, recurrent droughts are continually reducing its agricultural productivity, and the food crises of the 20<sup>th</sup> Century and the beginning of the 21<sup>st</sup> Century have led to an acceleration of rural exodus and migration (both among islands and internationally –Cabo Verde has a larger native population living abroad<sup>2</sup> –estimated 809,000 people –, and tops the ranking of 30 African countries where remittances matter most in GDP) (GoCV, 2014; UNCV, 2014). As a result, the country faces increasing challenges related to international and internal migration, which has been resulting both in population loss (net migration: -7,392 people in 2017), and rapid and unplanned urbanization in recent years (GoCV, 2017; WB, 2019).

The combination of insufficient reporting from drought and extreme temperatures impacts on the economy and society – mostly due to methodolog-

ical difficulties and lack of technical capacity to register deaths and the severe consequences at local level –, and the historical inability of the Government to prepare for drought impacts in advance, path the way for the country to pursue the development of innovative approaches for response to hydrometeorological events. Not only aimed at promoting and measuring the progress in resilience and the adaptive capacity of communities, but also, as a manner to include these topics into development policy, further exploring the development of future channels for appropriate financial mechanisms –such as climate finance and microfinance, which can give hope to smallholder farmers to proactively manage climate risks and uncertainties, and significantly reducing their future exposure and vulnerability.

#### The Risk Governance Framework Created for the 2017-18 Drought Event in Cabo Verde

Cabo Verde, as a Sahelian archipelagic country, often exposed to agrometeorological drought and high vulnerability to climate change has already observed changes in seasonal, weather, and rain patterns. Adding to the known aridity of the islands of the archipelago, the low capacity of the government to identify the severity of drought events promptly and to

TABLE 2  
CABO VERDE AID DEPENDENCY

	Net Official Development Assistance				Aid Dependency Ratios			
	Total (USD Millions)	Per Capita (USD)	Grants (USD Millions)	Technical Cooperation (USD Millions)	Net Official Development Assistance			
					% of GNI	% of Gross Capital Formation	% of Imports of Goods, Services, and Primary Income	% of Central Government Expenditure
<b>Cabo Verde (2017)</b>	123	225	8	4	7.2	19.0	9.6	-
Net Official Development Assistance Received (current USD)								
Year	1990	2000	2010	2013	2014	2015	2016	2017
Net Official Development Assistance Received (current USD)	105,280,000.00	94,650,000.00	326,980,000.00	245,160,000.00	231,390,000.00	152,820,000.00	113,360,000.00	123,000,000.00
Net ODA Received per capita (current USD)	311.5	221.0	663.7	479.1	446.5	291.2	213.4	228.8

Source: World Bank, (2019).

prepare in advance, synthesizes Cabo Verde society and economy’s high-level dependency to international support, as crucial factors limiting the national capacity to recover from disasters and crisis (Table 2) (World Bank, 2019).

In this regard, due to the fiscal and economic limitations, the country pledged international support to finance the drought emergency plan (8,225,806 USD), as well as asked for other forms of international assistance. The proportion of resources devoted to strengthening the institutional capacity of the central and local governments to respond to drought events was marginal tough, limited to 1,31% of the total expected budget (107,527 USD) (GoCV, 2017/2018).

Taking into consideration that the severe drought and food crisis initiated in 2017 is being referred to as the worst drought since 1977, and according to the Government Drought Emergency Plan (EP), some 17,203 agricultural households (62.3% of rural households) were vulnerable to the situation of low agricultural production in the period 2017-2018. To highlight the importance of this issue, beginning in 2013, the GoCV reported a series of drought events, fol-

lowed by irregular and insufficient rainy season in the period 2014-2016. At that time, these series of events were scarcely addressed by the government. As a result, the severity of the cumulative effects of recent drought (2017-18 period) event on agriculture and society is believed to be substantial – although the magnitude of its impacts on people’s livelihoods remains undervalued. Agriculture and livestock are the main sectors of economic activities for the people in rural areas –with agriculture, forestry, and fishing accounting to more than 8% of the national GDP between 2012-2016 –; the continuous recurrence of drought events, has diminished the productive base of the population year after year, reducing its participation in the GDP to 6% (2017), and 4,6% (2018) (World Bank, 2019).

According to Government reporting, the drought emergency has been affecting children, disabled people, and mono-parental families led by women disproportionately, reinforcing the prevalence of relatively high levels of undernourishment among vulnerable populations –between 14% (2005) to 12,3% (2016) of the population (FAO/ECA, 2018).

TABLE 3  
MAIN ELEMENTS OF THE OFFICIAL GOVERNMENT RESPONSE TO THE 2017-18 DROUGHT RESPONSE

Government Intervention Strategy			
<b>Creation of a Permanent Technical Steering Team (ETP)</b>	Resolution of the Council of Ministers, aiming at the coordination of all emergency operations; ETP team will be composed of technicians from the nuclear institutions for crisis management: DGASP-MAA, ANAS-MAA, DGPOG-MAA, ANMCV, NGO Platform, DGP-MF, DGC-MNEC, DGFIS-MEFIS and Chambers of Commerce.		
<b>Institutional articulation with FAO and other UN specialized agencies and Development Partners</b>	Look for the necessary technical and financial assistance for the successful implementation of the program.		
<b>Elements to Promote Participation of stakeholders</b>	The government seeks to involve beneficiaries and their organizations/representations, the Central Administration structures - in the agricultural and water sectors -, local authorities, the private sector, and the civil society organizations, in the discussions and development of actions, order to ensure local ownership and integration of different views.		
<b>Phasing-out of Actions</b>	<b>Action</b>	<b>Duration</b>	<b>Description</b>
	(i) the operational planning phase	1-2 months	Information and communication; socialization and programming of mitigation measures; and, the establishment of teams and measures, at all levels.
	(ii) the phase of implementation	12-14 months	Emergency measures put into practice, and preparation of the next agricultural campaigns (2018/2019)
	(iii) the final phase	2 months	Evaluation of interventions impacts and final report (2019).
<b>Territorial Approach</b>	Takes into account the specificity of each island and municipality, in terms of population affected, economic activities, the degree of emergency and availability of resources.		
<b>Information, communication and awareness-raising campaigns</b>	Official communication campaigns, in order to ensure the strong commitment of all beneficiaries and partners, as well as transparency and accountability of actions and resources.		

Source: Adapted from GoCV, (2017/2018).

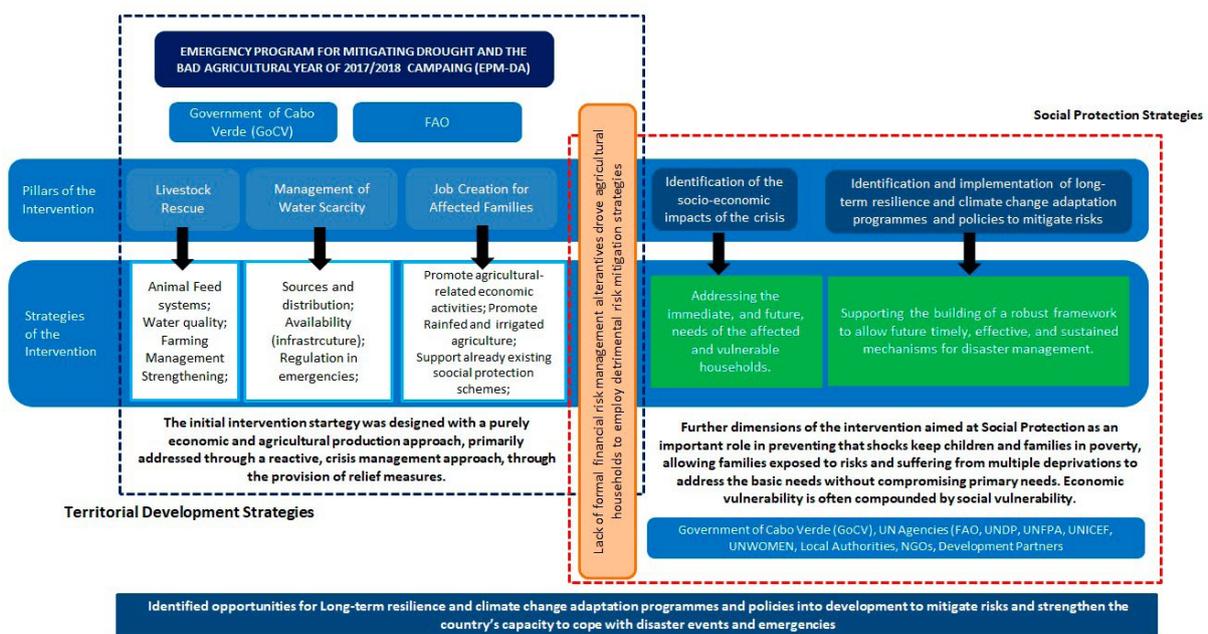
The Government Drought Emergency Plan (EP) was based on three pillars: (i) livestock rescue; (ii) management of water scarcity; and, (iii) creation of jobs for affected families. Its initial design was purely economic and focused on maintaining the levels of agricultural production. In this sense, the EP seemed to be primarily reactive, adopting a traditional crisis management approach through the provision of existent relief measures and limited existing social protection channels. However, with the worsening situation of the drought in the country, it became evident that the ongoing crisis needed an innovative approach to deal with the direct impacts on the increased vulnerability of households to external shocks. In the face of worsening developments, the EP was forced to evolve to a more comprehensive social approach, corresponding to cascade effects on different social aspects of the families, women, and children, in particularly vulnerable areas of the country. Table 3 summarizes the backbone of the government intervention strategy.

Moreover, the crisis exposed the nonexistence of formal financial risk management schemes in the country at that time, which commonly led agricultural households to employ detrimental risk mitigation strategies, such as low-risk/low-yield production tech-

niques, selling off productive capital, skipping meals, and withdrawing children from school, retro feeding negative livelihood consequences. Considering that the social dimensions of the crisis –initially ignored –became prominent. It became clear the need to add to the initial three pillars further actions to the official government response, based on the (iv) identification of the socioeconomic impacts of the crisis –to address not only the immediate needs of the affected and vulnerable households but also future needs and demands; and, the (v) identification of actions to put in place long-term resilience and climate change adaptation programmes integrated into national policies to mitigate risks and strengthen the country’s capacity to cope with disaster events and emergencies. Figure 5 describes the pillars and strategies adopted for the drought emergency response.

Such a paradigm shift has been translated into plans and strategies in an attempt to develop a robust framework to allow future timely, effective, and sustained mechanisms for disaster management based on Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), as part of the National Development Strategy (NDS), with prospects to mainstream DRR and CCA into the new Strategic Plan for Sustainable Development

FIGURE 5  
CABO VERDE’S DROUGHT EMERGENCY RESPONSE PROGRAM AND FURTHER SOCIAL DIMENSIONS OF THE INTERVENTION



Source: Adapted from GoCV, (2017/2018).

(2017-2021), which is also expected to be aligned with Sustainable Development Goals (SDGs) (GFDRR, 2017). If successful, this strategy could open doors for further mainstreaming of adaptation and disaster reduction into development policy and emergency response.

One of the main aspects of innovation in this revised approach may have something to do with the adoption of an inclusive corporate social responsibility framework for all emergency operations. It is guided by proper institutional articulation and synergy between involved actors, institutional cooperation with specialized development agencies. It included the design of participatory approaches involving the beneficiaries, the central and local administration authorities, the private sector, and civil society organizations. It is valuable to mention that this last element demands further investigation since the analysis of further actions to create additional awareness among beneficiaries for sustained social engagement demands time.

The intervention strategy also included the phasing out of actions according to their nature and urgency guided by the adoption of territorial development strategies to utilize data and information collected in the field, assessment analysis, dissemination of information and the implementation of awareness-raising campaigns through official communication channels. The adopted approach sought to ensure consistency of actions and to reconfigure resource access, control, and crisis management, empowering affected populations. The primary concern relates to the creation of an adaptive culture towards the negative impacts of climate change, taking both short- and long-term approaches to allow communities to manage climate change locally. In this regard, the current development of high-level national climate-related risks and strategies were handful to significantly initiate the pursue of climate-resilient development pathways, as some of the critical elements of resilience lie in sustainable development implementation correlating benefits from progress with the other (Denton *et al.*, 2014). Although, there is no one-size-fits-all approach to adapt to climate change (Carabine *et al.*, 2014), the country seems to be working to develop its path.

The National Drought Emergency Program (EP) was expected to run for 18 months, began March 2018 –regarding relief and humanitarian operations –, but is also aimed at achieving long-term goals of developing adaptive strategies and resilience building. The proposed long-term actions seek to mitigate the current effects of the drought event in the country and prepare the country for future events.

In this regard, this study would like to shed some light on the level of ambition proposed –especially on the challenges for future maintenance of the risk governance architecture created to respond to the drought emergency event. There is a clear risk that after the drought event ends, and the situation return to the “normal” again, the innovative risk governance scheme could be dragged into oblivion. The framework created may represent a promising step in building long-term resilience in the country, only if it survives in the long-term. It demands sustained political will and funding. In this regard, the risks are very high. Worldwide, the adaptation finance gap is enormous, and it is expected to grow substantially. By 2030, developing countries need to invest between 140-300 bn USD/year, while by 2050, the cost of adapting to climate change in developing countries could range 280-500 bn USD/year on adaptive measures (World Bank, 2010). Society and all levels of government must understand the rationale behind the costs in adapting to climate change and accelerate actions to reduce the risks involved.

The decision-making processes experienced in Cabo Verde may represent a replicable model for the building of climate-resilient pathways in the entire Region –namely Sahel and SIDS. Its persistence in time and proper allocation of already available resources seems to rise as a fundamental issue. Also, the shifting from external dependency –acting as a shaping factor, usually limiting ambition and the adoption of local solutions, keeps the affected livelihoods more vulnerable to subsequent drought events. It has to be addressed in short- to medium-term. Until there, the full integration of climate change responses into development policies and processes in Cabo Verde remains an aspirational goal. Notwithstanding, further studies to follow the development of ongoing decision-making are still needed. It is crucial to evaluate the effectiveness of overall integration and implementation of conflicting elements. So far, the development of the drought response framework represented an ambitious step for a country like Cabo Verde, constrained by the lack of human, economic, and fiscal resources for development and crisis management.

## Gaps

The expected decreasing income levels might bear further adverse consequences on before-mentioned aspects of the population’s well-being, such as food insecurity levels, malnutrition, health, and education.

Notwithstanding, inaccurate reporting from drought and extreme temperatures events continue to hinder a better understanding of these events in the country, with damaging effects on the social tissue and negatively affecting smallholder production, increasing uncertainties, and significantly increasing local and national exposure to climate risks.

Because vulnerability has a strong correlation with communities' capacity to adapt to changing conditions, which is by itself a function of the development and poverty levels. Cabo Verde, the Sahel and SIDS, are under unprecedented pressure due to natural and human-induced hazards and crisis. Such events are not only more frequent, but they are also more complex. In this context, a credible framework helped the government to secure international support for the drought response and elastic recovery –especially EU (European Union), aligned with funding for related interventions. However, a few gaps remained, such as:

- Difficulty in explaining to donors the additional cost of integrated disaster response, mostly because the country itself has no precise data and information on historical and frequent drought events.
- Challenges in securing national funds for DRR and capacity building for preparedness for recovery remains, despite recent established agreements.
- The limitation regarding comprehensive government assessment and technical capacity –as a tool to inform the development of a specific climate-resilient recovery plan –, may play an important role affecting timing to avoid losing momentum in future events.
- Persistent challenges to capture the economic effects and fiscal impacts of Climate and Hydro-meteorological disaster events; and, slow-onset disasters at the country level are still a barrier to improved implementation of sustainable DRR policies and actions.
- Key challenges remain in providing adequate room for meaningful community participation, as well as the proper development of adequate and inclusive risk and water governance schemes.

## Transformation

Given the seriousness of the discussed issues, the mainstreaming and linking of policy, planning and

programming frameworks for CCA and DRR within the broader context of poverty reduction and sustainable development represents an opportunity to overcome development policy and DRR gaps further. The proper allocations of such factors could allow the underlying of current and future causes of risk as well as possible timely identification of impacts as essential factors forging self-sustained climate-resilient pathways. These approaches could include DRR and CCA policies and planning at all levels (national, sectoral and sub-national); DRR programming and project design and implementation, as well as the design and development of local climate finance mechanisms to respond to disasters in particularly vulnerable areas.

More generally, the government in disaster-prone countries with a highly vulnerable population, such as Cabo Verde, have to be equally active about climate change adaptation strategies and social engagement. Political choices must translate into appropriate actions, strategies, and institutions highlighting cognitive benefits in front of the costs (Ferreira Costa and Da Silva, 2013) –since the perception of costs and benefits of mitigation (global) and adaptation (local) differ among actors (Denton *et al.*, 2014), and over time. Not only aimed at reducing disaster risk in rural and urban areas equally, but to avoid the creation of new risks by promoting better land use, stronger planning regulations, and building codes safeguarding, and protecting natural and human-made ecosystems. Actions to reduce poverty and active measures to reduce exposure to climate risks. Including, informed choices of accepting the challenge of fostering national synergies while avoiding negative feedbacks of local climate change responses may support the achievement of the Agenda 2030 in the country.

Despite all challenges, Cabo Verde seems to be working towards the development of a robust Disaster Risk Reduction Framework focused on the building of climate resilience. By approving a Post-Disaster Recovery Framework (OCHA, 2019), and a National Disaster Risk Reduction Strategy (UNDRR, 2019; 2019a) –which is support by International Organizations and the International Community, under the auspices of the Minister of Internal Affairs. The financing agreement between Cabo Verde, and the World Bank's International Bank for Reconstruction and Development (IBRD), and the International Development Association (IDA), also from the World Bank group, means a 40 million USD loan for budget support, additionally to the 10 million USD for the

DRR National Strategy, offering the Government the ways to implement its risk reduction policies and strategies.

The new alignment of the National Disaster Risk Reduction with the SFA (Sendai Framework for action) (GFDRR, 2017; UNDRR, 2019a), offered the first promising prospect to the mainstream DRR and CCA into the new Strategic Plan for Sustainable Development (2017-2021). Following similar orientation, the Drought Emergency Plan, advocating for long-term resilience and climate change adaptation programs. Can be read as a clear indication of a reinforced political will to design and implement better informed and funded policies to mitigate risks and strengthen the country's capacity to cope with disaster events and emergencies, having the SDGs as a North. The combination of these changes might represent the first steps of a shifting paradigm in Cabo Verde drought and overall disaster response.

### Channels for Improved Risk Communication

Furthermore, the design of participative channels for risk communication and awareness-raising among the populace has room to growth. Cabo Verde, as well as its counterparts in the Sahel and SIDS, can benefit from innovative approaches locally developed, boosting progress in resilience while promoting the needed adaptive capacity of communities, underlining the development of transformational actions from a reactive to a proactive people-centered approach to DRR and policy development.

Drought and overall disaster emergency assessments and plans might be designed and implemented to feed the development of National Disaster – especially Drought –Databases; to inform Plans; and, the integration of operational agriculture drought monitoring and early warning system in the region.

Although many countries face structural challenges and bottlenecks for its proper implementation, most of the solutions these countries need are already at hand. They demand support for proper public investment and financial mechanisms, such as contingency funds and crop insurance (Rojas, 2018; FAO/ECA, 2018).

In this regard, several challenges remain for the implementation of such schemes in the most vulner-

able agricultural areas, which is commonly hindered by poor political choices. In the case of the agricultural sectors, while the risks of climate variability on crop production are central to ensuring financially viable farming systems and sustainable food production as well as insurance mechanisms, they are neglected and, when used they often do not reflect local reality and needs. A further transformational change in local farming settings could offer efficient ways to manage, share, and transfer climate risks, and innovative approaches stimulated by the mainstreaming of CCA and DRR into development could be helpful to modify reality in Sahelian and archipelagic countries.

### Final Considerations

The cumulative impacts of the 2013-16 drought period, in combination with the extreme events of the 2017-18 agricultural years, and the delicate economic and fiscal situation of the country, pushed a paradigm shift in drought governmental intervention strategies. The government, with support of international partners, has been developing innovative drought and disasters response framework, structured around a national permanent Technical Steering Team (ETP, in Portuguese) – an Inter-Ministerial Task Force – responsible for the management and the implementation of articulated drought and disaster response in the country. The 2017-18 drought emergency plan innovated, mostly because it offered clear orientation regarding coordination and responsibilities to fill public risk governance gaps by exploring related society-stakeholders-government interactions for disaster reduction, emergency response, and climate resilience, with creation of the ETP, and receiving appropriate funding. Something that may seem simple to accomplish in many developed countries, but in the view of the peculiarities, level of territorial development, and political limitations experienced in Cabo Verde, demanded great political effort, political consensus, and funding –a paradigm shifting resulting from a steady awareness-raising, both among the elites and the affected populations themselves. It may forge a new development pathway where society and government have the power to define climate response strategies and not become merely spectators and victims of climate change.

## NOTES

- 1 MADRID methodology includes three components for analysis: (i) Mainstreaming DRR into Development Planning Processes at National and Local Level; (ii) Mainstreaming DRR into the Development Planning Processes of Sectors (Agriculture, Education, Health, Housing, Infrastructure, and Financial Services); and, (iii) Capacity Development for Mainstreaming DRR into Development Through Trainings UNISDR, (2013).
- 2 In the ranking of countries with Cape Verdean emigrants are the USA, Portugal (estimated to be

200,000, including those of Portuguese nationality), the Netherlands, Luxembourg, Switzerland, Sweden, Germany, Spain, other Portuguese Speaking African Countries (PALOP, in Portuguese) members, and Senegal; Brazil, Argentina, and China. The population of Santiago migrates to Portugal, France, to Europe; while the population of Fogo and Brava choose the United States – this is how Cape Verdean migratory lines are drawn (GoCV, 2014).

## REFERENCES

- Abiodun, B., Adegoke, J., Abatan, A., Ibe, C., Egbebiyi, T., Engelbrecht, F., Pinto, I., (2017): "Potential Impacts of Climate Change on Extreme Precipitation over Four African Coastal Cities". *Climate Change*. Vol. 143. Issue 3-4. pp.399-413. Available at: <<https://doi.org/10.1007/s10584-017-2001-5>>. Accessed on January 30, 2019
- Adeyeri, O.E., Lawin, A.E., Laux, P., Ishola, K.A., Ige, S.O., (2019): "Analysis of Climate Extreme Indices Over the Komadugu-Yobe Basin, Lake Chad Region: Past and Future Occurrences". *Weather and Climate Extremes*. Available at: <<https://doi.org/10.1016/j.wace.2019.100194>>. Accessed on January 30, 2019.
- Adeyeri, O., Ishola, K., Okogbue, E., (2017): "Climate Change and Coastal Floods: the Susceptibility of Coastal Areas of Nigeria". *Journal of Coastal Zone Management*. Vol. 20. 443p. Available at: <[https://www.researchgate.net/publication/318351756\\_Climate\\_Change\\_and\\_Coastal\\_Floods\\_The\\_Susceptibility\\_of\\_Coastal\\_Areas\\_of\\_Nigeria](https://www.researchgate.net/publication/318351756_Climate_Change_and_Coastal_Floods_The_Susceptibility_of_Coastal_Areas_of_Nigeria)>. Accessed on January 30, 2019.
- Agnew, C.T., Chappell, A., (2000): Drought in the Sahel". *Geo Journal*. Vol. 48, Issue 4, pp-229-311. Available at: <<https://doi.org/10.1023/A:1007059403077>>. Accessed on January 30, 2019.
- Algamal, S.A., (2011): "An Assessment of Climate-Induced Conflict Risks Over Shared Water Resources in Africa". Filho, W.L. (Ed.) "The Economy, Social, and Political Elements of Climate Change". *Climate Change Management*. Available at: <[https://doi.org/10.1007/978-3-642-14776-0\\_2](https://doi.org/10.1007/978-3-642-14776-0_2)>. Accessed on January 30, 2019.
- Attoguinon, A., Lawin, A., M'Po, Y., Hougue, R., (2017): "Extreme Precipitation Indices Trend Assessment Over the Upper Oueme River Valley - (Benin)". *Hydrology*. Vol. 4. Issue 4. 36p. Available at: <<https://doi.org/10.3390/hydrology4030036>>. Accessed on January 30, 2019
- Bora, S., Ceccacci, I., Delgado, C., Townsend, R., (2011): "Food Security and Conflict. Agriculture and Rural Development". *World Development Report 2011*. Background Paper. World Bank. Available at: <<http://documents.worldbank.org/curated/en/622491468331234468/pdf/620340WP0Food00BOX0361475B00PUBLIC0.pdf>>. Accessed on January 16, 2019.
- Boratynska, K., Huseynov, R.T., (2017): "An Innovative Approach to Food Security Policy in Developing Countries". *Journal of Innovation & Knowledge*. Vol. 2. Issue 1. pp. 39-44. Available at: <<https://doi.org/10.1016/j.jik.2016.01.007>>. Accessed on February 02, 2019
- Caniato, M., Carliez, D., Thulstrup, A., (2017): "Challenges and Opportunities of New Energy Schemes for Food Security in Humanitarian Contexts: a Selective Review". *Sustainable Energy Technologies and Assessments*. Vol. 22. pp. 208-219. Available at: <<https://doi.org/10.1016/j.seta.2017.02.006>>. Accessed on January 30, 2019.
- Carabine, E., Lemma, A., Dupar, M., Jones, L., Mulugetta, Y., Ranger, N., Van Aalst, M., (2014): "The IPCC's Fifth Assessment Report: What is in It for Africa? "Overseas Development Institute and Climate and Development Knowledge Network. 79p. Available at: <<https://cdkn.org/wp-content/>

- uploads/2014/04/AR5\_IPCC\_Whats\_in\_it\_for\_Africa.pdf>. Accessed on January 10, 2019
- Couttenier, M., Soubeyran, R., (2013): “Drought and Civil War in Sub-Saharan Africa”. *The Economic Journal*. Vol. 24. pp. 201–244. Available at: <<https://doi.org/10.1111/ecoj.12042>>. Accessed on January 30, 2019.
- Chatzopoulos, T., Domínguez, I.P., Zampieri, M., Toreti, A., (2019): “Climate Extremes and Agricultural Commodity Markets: a Global Economic Analysis of Regionally Simulated Events”. *Weather and Climate Extremes*. Available at: <<https://doi.org/10.1016/j.wace.2019.100193>>. Accessed on January 11, 2019.
- Dai, A., (2011): “Drought Under Global Warming: A Review”. *Wiley Interdisciplinary Reviews: Climate Change*. Vol., 2. Issue 1. pp. 45–65. Available at: <<https://doi.org/10.1002/wcc.81>>. Accessed on January 10, 2019.
- Denton, F., T.J. Wilbanks, A.C. Abeysinghe, I. Burton, Q. Gao, M.C. Lemos, T. Masui, K.L. O’Brien, Warner, K., (2014): “Climate-Resilient Pathways: Adaptation, Mitigation, and Sustainable Development”. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom, and New York, NY, USA, pp. 1101-1131.
- Escudero, O.A.I.; Reid, R.C.J., (2018): “Concept Program Information Document (PID) - Cabo Verde Disaster Risk Management Development Policy Credit and Loan with Cat DDO”. *P160628 (English)*. Washington, D.C.: World Bank Group. Available at: <<http://documents.worldbank.org/curated/en/125621531480106694/pdf/Concept-Program-Information-Documents-PID-Cabo-Verde-Disaster-Risk-Management-Development-Policy-Credit-and-Loan-with-Cat-DDO-P160628.pdf>>. Accessed on January 14, 2019.
- Ferreira Costa, C., Da Silva, E., (2013): “Normative Models in the Construction and Evaluation of Public Policies”. *Revista Gestão & Políticas Públicas*. Vol. 3. Issue. 1. pp433-442. Available at: <<http://www.revistas.usp.br/rgpp/article/view/98583/97252>>. Accessed on January 19, 2019.
- Hall, J.W., Grey, D., Garrick, D., Fung, F., Brown, C., Dadson, S.G., Sadoff, C.W., (2014): “Coping with the Curse of Freshwater Variability: Institutions, Infrastructure, and Information for Adaptation”. *Science*. Vol. 346. N 6.208. pp. 429-430. Available at: <<https://doi.org/10.1126/Science.1257890>>. Accessed on February 02, 2019
- Hendrix, G.S., (2014): “Water and Security in Niger and the Sahel”. *Climate Change and African Political Stability*. Research Brief No 24. The Robert S. Strauss Center for International Security and Law. The University of Texas. 8p.
- Kummu, M., Guillaume, J.H.A., Moel, H., Eisner, S., Florke, M., Porkka, M., Siebert, S., Veldkamp, Ward, P.J., (2016): “The World’s Road to Water Scarcity: Shortage and Stress in the 20th Century and Pathways Towards Sustainability”. *Scientific Reports*. Vol. 6. 38495. Available at: <<https://doi.org/10.1038/srep38495>>. Accessed on January 12, 2019.
- Masih, I., Maskey, S., Mussá, F.E.F., Trambauer, P., (2014): “A review of droughts on the African continent: a geospatial and long-term perspective”. *Science*. Vol. 18, pp. 3635-3649. Available at: <<https://doi.org/10.5194/hess-18-3635-2014>>. Accessed on February 02, 2019.
- Miyan, M.A., (2015): “Droughts in Asian Least Developed Countries: Vulnerability and Sustainability”. *Weather and Climate Extremes*. Vol. 7, pp. 8-23. Available at: <<https://doi.org/10.1016/j.wace.2014.06.003>>. Accessed on February 02, 2019
- Porkka, M., Gerten, D., Schaphoff, S., Siebert, S., Kummu, M., (2016): “Causes and Trends of Water Scarcity in Food Production”. *Environmental Research Letters*. Vol. 11. N. 1. Available at: <<https://doi.org/10.1088/1748-9326/11/1/015001>>. Accessed on January 14, 2019
- Rojas, O, (2018): “Agricultural Extreme Drought Assessment at Global Level Using the FAO-Agricultural Stress Index System (ASIS)”. *Weather and Climate Extremes*. Elsevier. Available at: <<https://doi.org/10.1016/j.wace.2018.09.001>>. Accessed on January 30, 2019
- Sheffield, J., Wood, E. F., and Roderick, M. L., (2012): “Little Change in Global Drought Over the Past 60 Years”. *Nature*. Vol. 491. pp. 435–438. Availa-

ble at: <<http://www.nature.com/nature/journal/v491/n7424/abs/nature11575.html#supplementary-information>>. Accessed on January 16, 2019.

Simon, L., Mattelaer, A., Hadfield, A., Morin, M.A., (2012): "A Coherent EU Strategy for the Sahel". *Directorate-General for External Policies of The Union*. Directorate B. Policy Department. Europe-

an Parliament's Committee on Development. Available at: <[https://www.europarl.europa.eu/thinktank/en/document.html?reference=EXPO-DEVE\\_ET\(2012\)433778](https://www.europarl.europa.eu/thinktank/en/document.html?reference=EXPO-DEVE_ET(2012)433778)>. Accessed on February 02, 2019

## SOURCES

CILSS, (2017): *Situation de la Sécurité Alimentaire et Nutritionnelle au Sahel et en Afrique de L'ouest - Courance (Octobre-Décembre 2017) et Projeteé (Juin-Août 2018)*. Cadre Harmonisé Manual. Permanent Interstate Committee for Drought Control in the Sahel (CILSS). 4p. Available at: <<https://reliefweb.int/report/cabo-verde/situation-de-la-scurit-alimentaire-et-nutritionnelle-au-sahel-en-afrique-de-l>>. Accessed on February 17, 2019

EM-DAT, (2018): *The Emergency Events Database*. Université Catholique de Louvain (UCL) – CRED, Brussels, Belgium. Available at: <<https://www.emdat.be/index.php#letterd>>. Accessed on January 2, 2019.

FAO/ECA, (2018): *Regional Overview of Food Security and Nutrition. Addressing the Threat from Climate Variability and Extremes for Food Security and Nutrition*. Food and Agriculture Organization of the United Nations/United Nations Economic Commission for Africa. Accra. 116 pp. Available at: <<http://www.fao.org/3/CA2710EN/ca2710en.pdf>>. Accessed on February 19, 2019

FAO/IFAD/UNICEF/WFP/WHO, (2017): *The State of Food Security and Nutrition in the World 2017: Building Resilience for Peace and Food Security*. Rome. FAO. 132p. Available at: <<http://www.fao.org/3/a-I7695e.pdf>>. Accessed on January 16, 2019.

FAO, (2018): *Press Release on the Final Results of the 2017-2018 Agro-pastoral Season and the Food and Nutrition Situation in the Sahel and West Africa*. Cadre Harmonisé Analysis June-August 2018. Food and Agriculture Organization. Documents. April 2018. Available at: <<http://www.fao.org/emergencies/resources/documents/resources-detail/en/c/1114249/>>. Accessed on January 22, 2019.

GFDRR, (2017): *Focus Day on Post Disaster Response and Recovery Frameworks*. ACP-EU: Natural Disaster Risk Reduction Program. Global Facility for Disaster Risk Reduction. ACP House – Brussels, June 9, 2017. Available at: <<https://www.gfdr.org/sites/default/files/publication/CABO%20VERDE%20-%20ACP-EU%20NDRR%20Focus%20Day%20presentation%20-%2009%20June%202017.pdf>>. Accessed on: February 13, 2019.

GoCV/FAO/CILSS, (2017): *Mision Conjunta Gobierno/CILSS/FAO D'Évaluation Prélimaire des Recoltes de la Campagne 2017/2018*. Ministry of Agriculture and Environment/Food and Agriculture Organization of the United Nations/ Permanent Interstate Committee for Drought Control in the Sahel. 33p. Praia, November, 2017.

GoCV, (2017/2018): *Emergency Program for Mitigating Drought and the Bad Agricultural Year of 2017/2018 Campaign (EPM-DA) in Cabo Verde*. Ministry of Agriculture and Environment. 13p. Praia, October 3, 2017.

GoCV, (2017): *National Disaster Risk Reduction Strategy of Cabo Verde (ENRRD-CV)*. Republic of Cabo Verde/UNDP Cabo Verde. 120p. Available at: <[https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/enrrd\\_estrategia\\_nacional\\_de\\_reducao\\_de\\_riscos\\_de\\_desastres\\_cabo\\_verde.pdf](https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/enrrd_estrategia_nacional_de_reducao_de_riscos_de_desastres_cabo_verde.pdf)>. Accessed on: February 13, 2019.

GoCV, (2016): *Resolution nº 77/2016, October 21, 2016: Declaration of Public Calamity on the Island of Santo Antão, due to the Damages Caused by the Rains that Occurred between September 12 and 20, 2016*. Imprensa Nacional de Cabo Verde. Boletim official. I Série. no 60, October 21, 2019.

GoCV, (2014/2015): *Post-Disaster Needs Assessment (PDNA): Fogo Volcanic Eruption*. The Republic of

- Cabo Verde. 128 p. Available at: <<https://www.gfdrr.org/sites/default/files/publication/pda-2015-fogo-en.pdf>>. Accessed on February 13, 2019.
- GoCV, (2014). *Estratégia Nacional de Emigração e Desenvolvimento: Linhas de Orientação para Ação*. Ministério das Comunidades. 104p. Accessed on August 19, 2018.
- GoCV/MAHOT, (2013): *Systematic Inventory Evaluation for Risk Assessment (SIERA)*. Republic of Cabo Verde/Ministry of Environment, Housing, and Territory, Final Report. December 2013. Available at: <[https://www.preventionweb.net/files/Relatorio%20SIERA\\_Cabo%20Verde.pdf](https://www.preventionweb.net/files/Relatorio%20SIERA_Cabo%20Verde.pdf)>. Accessed on: February 13, 2019.
- GoCV, (2007): *National Adaptation Programme of Action on Climate Change (NAPA-Cabo Verde)*. The Republic of Cabo Verde. Ministry of Environment and Agriculture. National Meteorology and Geophysics Institute. 40p.
- IPCC, (2018): *Summary for Policymakers. In: Global warming of 1.5°C*. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp. Available at: <<https://www.ipcc.ch/sr15/chapter/spm/>>. Accessed on January 16, 2019.
- IPCC, (2014): *Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- IPCC, (2014a): *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- IPCC, (2013): *Climate Change 2013: the Physical Science Basis*. T.F. Stocker, D. Qin, G.K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, P.M. Midgley (Eds.). Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA (2013), 1535P. Available at: <<https://www.ipcc.ch/report/ar5/wg1/>>. Accessed on January 30, 2019.
- OCHA, (2019): *Quadro de Recuperação Pós-Desastre –Cabo Verde*. Government of Cabo Verde. Humanitarian Response. 189p. Available at: <[https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/quadro\\_de\\_recuperacao\\_pos-desastre\\_-\\_cabo\\_verde.pdf](https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/quadro_de_recuperacao_pos-desastre_-_cabo_verde.pdf)>. Accessed on August 15, 2019.
- OCHA, (2018): *World Humanitarian Data and Trends*. OCHA's Policy Branch. Analysis and Innovation Section United Nations. 38p. Available at: <[https://reliefweb.int/sites/reliefweb.int/files/resources/WHDT2018\\_web\\_final\\_spread.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/WHDT2018_web_final_spread.pdf)>. Accessed on January 11, 2019.
- OCHA, (2017): *Sahel 2014-2016 Regional Humanitarian Response Strategy Reviewed*. 60p. Available at: <<https://reliefweb.int/sites/reliefweb.int/files/resources/Sahel-EYReport-2016-LowRes.pdf>>. Accessed on January 11, 2019.
- OCHA, (2013): *Sahel Regional Strategy*. United Nations. 41p. Available at: <[https://reliefweb.int/sites/reliefweb.int/files/resources/SahelStrategy2013\\_Dec2012.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/SahelStrategy2013_Dec2012.pdf)>. Accessed on January 11, 2019.
- OCHA/ReliefWeb, (2013): *Cabo Verde's Location Map*. UN Office for the Coordination of Humanitarian Affairs. PNG (117 Kb). Available at: <<https://reliefweb.int/map/cabo-verde/cape-verde-location-map-2013>>. Accessed on January 14, 2019.
- QGIS, (2019). QGIS Software, Version 3.3.4-Madeira. Elaboration of Maps. Coordinates System: Geo-

- graphic (GCS). DATUM: 4326-WGS 84. Shapefiles: GADM/ESRI/GOOGLE. Available at: <<http://www.maplibrary.org/library/stacks/Africa/Cape%20Verde/index.htm>>, and Available at: <[https://gadm.org/download\\_country\\_v3.html](https://gadm.org/download_country_v3.html)>, and Available at: <[https://www.qgis.org/pt\\_BR/site/](https://www.qgis.org/pt_BR/site/)>. Accessed on January 05, 2019
- UNDRR, (2019): *Estratégia Nacional de Redução de Risco de Desastres Cabo Verde (ENRRD-CV)*. Government of Cabo Verde. 120p. Available at: <[https://www.preventionweb.net/files/64563\\_enrrdestrategianacionaldereducaoder.pdf](https://www.preventionweb.net/files/64563_enrrdestrategianacionaldereducaoder.pdf)>. Accessed on August 15, 2019.
- UNDRR, (2019a): *Cabo Verde Government DRR Policies and Strategies*. Platform. Available at: <<https://www.preventionweb.net/organizations/3866>>. Accessed on August 15, 2019.
- UNCV, (2014): *Apresentação Pública da Estratégia Nacional de Emigração e Desenvolvimento*. Biblioteca Nacional. United Nations Cabo Verde. 4p. Accessed on August 19, 2019.
- UNESCO, (2018): *The United Nations World Water Development Report: Nature-Based Solutions for Water*. Paris. UNESCO. 154p. Available at: <<https://unesdoc.unesco.org/ark:/48223/pf0000261424>>. Accessed on January 16, 2019.
- UNISDR, (2019): *2018: Extreme Weather Events Affected 60m People*. United Nations Office for Disaster Risk Reduction. Geneva, 24 January 2019. Available at: <<https://www.undrr.org/news/2018extreme-weather-events-affected-60m-people>>. Accessed on January 29, 2019.
- UNISDR, (2013): *Mainstreaming Adaptation and Disaster Reduction into Development (MADRiD)*. Programme Overview. Available at: <[https://www.unisdr.org/files/35757\\_madridshortoverview2013.pdf](https://www.unisdr.org/files/35757_madridshortoverview2013.pdf)>. Accessed on January 02, 2019.
- UNISDR, (2013a): *Mainstreaming Disaster Risk Reduction into Development*. A Program of the Regional Consultative Committee on Disaster Management (RCC). 20p. Available at: <[https://www.adpc.net/igo/category/ID131/doc/2013-ptk7NA-ADPC-Brochure-Phase\\_III-RCC\\_MDRD-resized.pdf](https://www.adpc.net/igo/category/ID131/doc/2013-ptk7NA-ADPC-Brochure-Phase_III-RCC_MDRD-resized.pdf)>. Accessed on January 02, 2019.
- WORLD BANK, (2019). *World Development Indicators: Cabo Verde*. Databank. The World Bank. Available at: <<https://databank.worldbank.org>>. Accessed on August 19, 2019.
- WORLD BANK, (2010). *The Costs to Developing Countries of Adapting to Climate Change: New Methods and Estimates –The Global Report of the Economics of Adaptation to Climate Change Study*. Margulis, S.; Narain, U. Consultation Draft. The World Bank Group. 98p. Available at: <<http://documents.worldbank.org/curated/pt/667701468177537886/The-costs-to-developing-countries-of-adapting-to-climate-change-new-methods-and-estimates-the-global-report-of-the-economics-of-adaptation-to-climate-change-study>>.
- WORLDPOP, (2018). *Global High-Resolution Population Denominators Project - Funded by The Bill and Melinda Gates Foundation (OPP1134076)*. School of Geography and Environmental Science, University of Southampton; Department of Geography and Geosciences, University of Louisville; Departement de Géographie, Université de Namur) and Center for International Earth Science Information Network (CIESIN), Columbia University (2018). Available at: <https://dx.doi.org/10.5258/SOTON/WP00645>. Accessed on August 19, 2019

**UNDERSTANDING AND REDUCING RISKS: THE IMPACT OF INNOVATIVE POLICIES FOR SUSTAINABLE DROUGHT RESPONSE IN CABO VERDE**

**CCA** –Climate Change Adaptation

**CILSS** –Permanent Interstate Committee for Drought Control in the Sahel

**DRR** –Disaster Risk Reduction

**EU** –European Union

**FAO** –Food and Agriculture Organization

**FAO/ECA** –Food and Agriculture Organization/United Nations Economic Commission for Africa

**GFDRR** –Global Facility for Disaster Risk Reduction

**GoCV** –Government of Cabo Verde

**GoCV/MAHOT** –Government of Cabo Verde/ Ministry of Environment, Housing, and Territory of Cabo Verde

**HDI** –Human Development Index

**HEA** –Household Economy Approach

**IFAD** –The International Fund for Agricultural Development

**IPCC** –Intergovernmental Panel on Climate Change

**MADRiD** –Mainstreaming Adaptation and Disaster Reduction into Development

**OCHA** –The United Nations Office for the Coordination of Humanitarian Affairs

**PALOP** –Países Africanos de Língua Oficial Portuguesa (Portuguese Speaking African Countries)

**SDGs** –Sustainable Development Goals

**SFA** –The Sendai Framework for Action

**SIDS** –Small Island Development States

**UNESCO** –The United Nations Educational, Scientific and Cultural Organization

**UNDRR** –The United Nations Office for Disaster Risk Reduction

**UNICEF** –The United Nations Children’s Fund

**UNISDR** –The United Nations International Strategy for Disaster Reduction

**UN-OHRLS** –The United Nations Office of the High Representative for the Least Developed Countries

**WFP** –World Food Program

**WHO** –World Health Organization