



CLIMATE SECURITY IN THE WESTERN INDIAN OCEAN



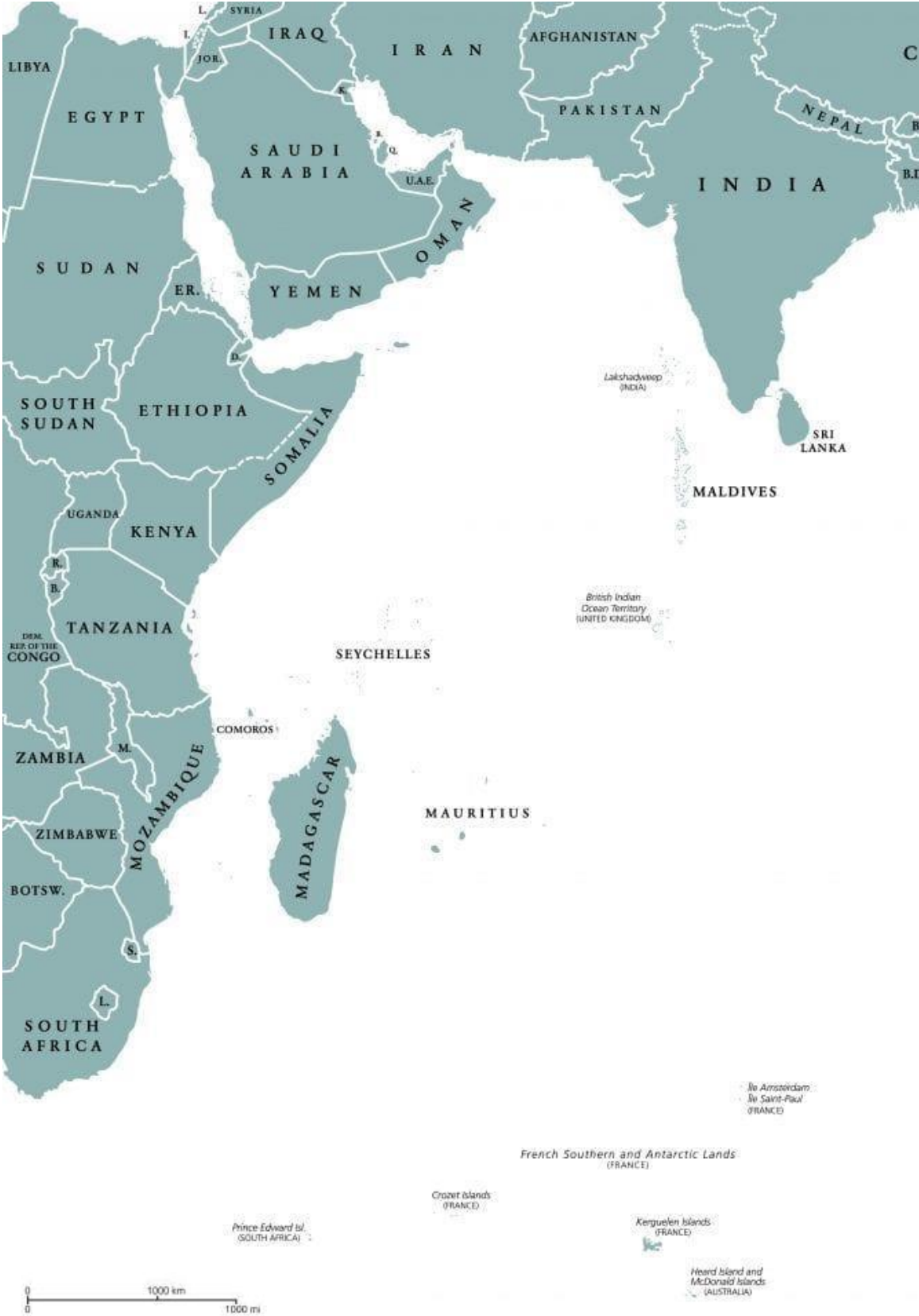
FOREWORD

The Ministry of Armed Forces regularly outsources studies to private research institutes, according to a geographical or sectoral approach, aimed to complement its internal expertise. These contractual relations are part of the development of the prospective approach to defence, which, as underlined by the latest White Paper on Defence and National Security, "must be able to draw on an independent, multidisciplinary, original strategic reflection, integrating academic research as well as the one of specialised institutes".

A large part of these studies was made public and available on the site of the Ministry of Armed Forces. In the case of a study published in a piecemeal manner, the Directorate General for International Relations and Strategy can be contacted for more information.

DISCLAIMER: The statements made in studies and observatories do not engage the responsibility of the Directorate-General for International Relations and Strategy nor the one of the lead agency for this study, nor do they reflect an official position of the Ministry of the Armed Forces.

GEOGRAPHICAL SCOPE OF THE REPORT



EXECUTIVE SUMMARY

PART 1: A CHANGING STRATEGIC ENVIRONMENT

1) Main strategic trends in the Indian Ocean region

The Indian Ocean (IO) is a strategic area, whose importance significantly grew since the Cold War.

Crucial maritime crossroad

Rich in natural resources, the IO is the busiest trade route worldwide. The trade flow concentration gives to maritime openings and straights a critical importance (oil and gas trade playing a major role). China's vigorous economic growth contributed to the rapid development of littoral countries.

Growing competition between India, China and the United States in the Indian Ocean

The United States (US) became IO's hegemonic power in the aftermath of WWII. However, its influence tends to decrease while India and China strengthen their military capabilities and expand their presence. China developed the Belt and Road Initiative (BRI) since 2013, which aims to increase trade flows to and from China through a series of trade partnerships and massive investments in foreign transport infrastructures. This growing influence generates concerns and counter-balancing attempts. The US and India, seeking to maintain their presence over the IO, reinforced their cooperation. **The competition between India and China leads to a race for access to overseas military bases, civil facilities and market shares in transport infrastructures.**

Parallel middle powers' influence strategies

In this context, **regional middle powers such as France and Australia also reinforced their involvement in the region. Both countries** seek to fortify multilateralism, cooperation and dialogue, especially with 'like-minded' countries, such as India. This also includes strengthening and empowering regional organisations and institutional mechanisms competent on security issues.

National and international fragmentation dynamics

The security architecture in the region is very fragile, with numerous organisations covering specific topics. This situation leads to simultaneous regional integration and fragmentation dynamics. The shortcomings of the regional security context encourage countries to develop *hedging strategies* and strengthen their own military capabilities. The resulting fragile balance is put at risk by traditional points of tension such as border disputes, but also by national crises. The latter tend to spread across borders, as it is the case in the Horn of Africa. International and national tensions seem to be multiplying, due to significant

and exacerbating divisions between and inside countries political, cultural, ethnic, religious, economic and ideological issues.

II) Specific issues in the Western Indian Ocean

Weak states, fragile states and crises internationalisation

Whereas some Indian Ocean littoral states are among the richest, the Western Indian Ocean (WIO) is mainly composed of “least developed countries”. Many are considered as fragile states and experience humanitarian crisis and civil war. Several terrorist groups emerged in the area and expanded their presence, especially in East Africa.

Increasing influence of non-state actors

State weakness jeopardizes economic development and contributes to the emergence of a power vacuum, at risk of being filled by non-state actors. Criminal activities endanger traditional economic sectors and affect livelihoods, driving population to migrate. **The growth of criminal activities contributes to weaken states’ capacity over their territory and population.** It also favours the establishment of international criminal and terrorist networks, such as the ‘smack track’ from Afghanistan to Mozambique.

Significant human insecurity

As a result, important human insecurity issues, worsened by armed conflicts and public services weaknesses, affect most WIO countries. These sources of insecurity impact economic growth, coupled with remaining structural deficiencies and vulnerabilities - such as low levels of industrialisation and dependency on primary commodities exports. Population growth, significant migratory flows and urbanisation add up to existing tensions, whereas the region already experience regular hunger crisis and water scarcity. While numerous WIO countries heavily depend on ecosystems for food, water and jobs, these are increasingly degraded by ever growing human pressures, natural resources depletion and climate change impacts.

III) Climate change impacts in the Western Indian Ocean

Rising atmospheric temperatures and changing rainfall patterns

Various climate change impacts threaten livelihoods in the region. Atmospheric temperatures are expected to rise - feeding in increasing drought trends - and monsoon will become increasingly difficult to forecast. All these trends endanger livelihoods and especially food security. Heat waves might also affect productivity, while thermal shocks will reduce working hours span. **Overall, heat waves and water scarcity will trigger stress for both humans and crops, potentially leading to food systems destabilisation.**

Disrupted precipitation regimes and extreme weather events

The convergence of different climate phenomena (El Nino Southern Oscillation, Indian Ocean Dipole) leads to high forecast uncertainty. Growing sea surface temperature, both a cause and a result of these phenomena, will affect precipitations: **droughts and heavy rainfalls alternation might result in water scarcity, landslides and booming vector-borne diseases.**

Warmer sea surface temperature will facilitate cyclones formation, in the world's most prolific ocean for tropical cyclones. Increased tropical storms size and lifetime will lead to more (+8 % per decade) cyclones - which are very intense storms. **As a result, HADR operations are expected to become more frequent and will require the involvement of military means in new territories,** where extreme weather events occurrence was relatively low before. Additional threats such as the underwater volcano emerging off the coasts of Mayotte might also mobilise defence forces capacities.

Ocean warming: sea level rise and fish migration

Ocean warming prompts sea-level rise, both due to Antarctic ice melting and dilatation. **The significant but disparate sea-level rise in the WIO threatens coastal populations' physical and food security.** This raises concern in a zone where crucial marine biodiversity faces destruction due to urban development and pollution, thus weakening ecosystem services of mangroves, beaches and coral reefs. **Ocean warming will also affect fish stocks in the region: migrating poleward and towards deeper zones of the ocean, fish schools will get unreachable to local and industrial fishing fleets.** The projected threefold decrease in catch potential could threaten coastal populations' livelihoods and fuel tensions in the fishing sector. Fish depletion could significantly impact island countries' economy and push populations to look for alternative revenue streams or migrate.

PART 2: RISK ASSESSMENT MATRIX

The following matrix aims to describe interactions between all aforementioned changes and well-known, more established risks.

RISK PROFILE

military HADR missions related risks (low intensity)

defence forces surveillance missions related risks (low intensity)

area geopolitical situation related risks (low intensity)

counter-terrorism efforts related risks (high intensity)

TABLE 1: Climate-related risks in the WIO region that would require a military involvement (i.e. requiring military involvement).

		SERIOUSNESS				
		No disruptive effects; 'business as usual'	Tensions temporarily increase ; situation is manageable within existing processes	Conflict is temporary and generally constrained by existing arrangements	Significant disruption; limited to areas	Significant widespread disruptions
LIKELIHOOD		NEGLIGIBLE	MINOR	SIGNIFICANT	MAJOR	CATASTROPHIC
Most unlikely but might occur in exceptional circumstances	RARE	-	-	-	-	-
Unlikely to occur without significant change in current circumstances	UNLIKELY	-		-	-	-
Can occur in most circumstances in the foreseeable future	POTENTIAL	-	Rejection of a foreign presence or private assets	Growing influence of major powers in the region	Strategic infrastructure degradation or destruction	-
			Political instability and social tension due to economic/food insecurity		Terrorist attack on public or private assets	
Will occur in current circumstances	LIKELY	-	Mis-development and mis-adaptation to climate change	Pressure on HADR capacities	Sanitary crisis	-
			Significant planned displacements			
Already occurs regularly	ALMOST CERTAIN	-	Criminal activity increase	More frequent incursions in EEZ	-	Fish stock depletion
				Irregular migrations		

PART 3: RECOMMENDATIONS

I. General regional cooperation (diplomatic, scientific, political)

Greater regional cooperation in different domains is needed to tackle the security impacts of climate change in the IO. France, Australia and India can lead such regional cooperation, which should also include island states and territories. Such cooperation should include diplomatic, scientific and political dimensions. We provide here recommendations to foster the implementation of such initiatives:

- Reinforce scientific cooperation
- Support the extension of the Pacific Environmental Security Forum towards the West of the Indian Ocean
- Support regional organisations
- Build capabilities in maritime domain awareness
- Provide training in port state control enforcement

II. Vulnerability of key infrastructures (prevention)

Sea-level rise and other climate change impacts will put significant military and civilian facilities at risk. Yet data on key infrastructures remain scarce as urbanisation expanded quickly in the region, sometimes in the absence of adequate regulatory frameworks.

- Identify key infrastructures and assess their vulnerability to climate change impacts
- Address gaps in the international regulatory regime for undersea cables

III. Human security challenges (intervention)

The absence of coordinated relief structure remains a significant problem, despite the presence of the PIROI, a regional structure from the Red Cross/Red Crescent.

- Strengthen maritime safety capacity building
- Implement cooperation in disaster risk reduction and relief

IV. Maritime surveillance

Maritime surveillance is another domain that could benefit from greater cooperation, and for which an extension of the Pacific Environmental Security Forum towards the West of the Indian Ocean could play a pivotal role.

- Foster cooperative responses to IUU fishing
- Build dialogue among coastguard agencies.