



ADAPTIVE MARITIME SECURITY

**Developing Resilient Strategies for Safeguarding
African Waters in a Dynamic Threat Environment**

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INTRODUCTION

- Africa's maritime sector contributes significantly to national and regional economies
- Threats in African waters have local, regional and global implications
- Traditional maritime security strategies are often inadequate for the complex, evolving and unpredictable challenges
- Need for adaptive strategies that can respond to dynamic threats

AGENDA

1. Maritime Security
Complexity in Africa
2. Maritime Security Strategy
3. Complex Adaptive Systems
4. Core principles for an
Adaptive MSS





COMPLEXITY OF MARITIME SECURITY IN AFRICA

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Key threats:

- 1.** Piracy and armed robbery at sea (Gulf of Guinea, Horn of Africa)
- 2.** Illegal, Unreported, and Unregulated (IUU) fishing
- 3.** Trafficking (drugs, arms, humans)
- 4.** Environmental degradation and climate change impacts
- 5.** Maritime terrorism

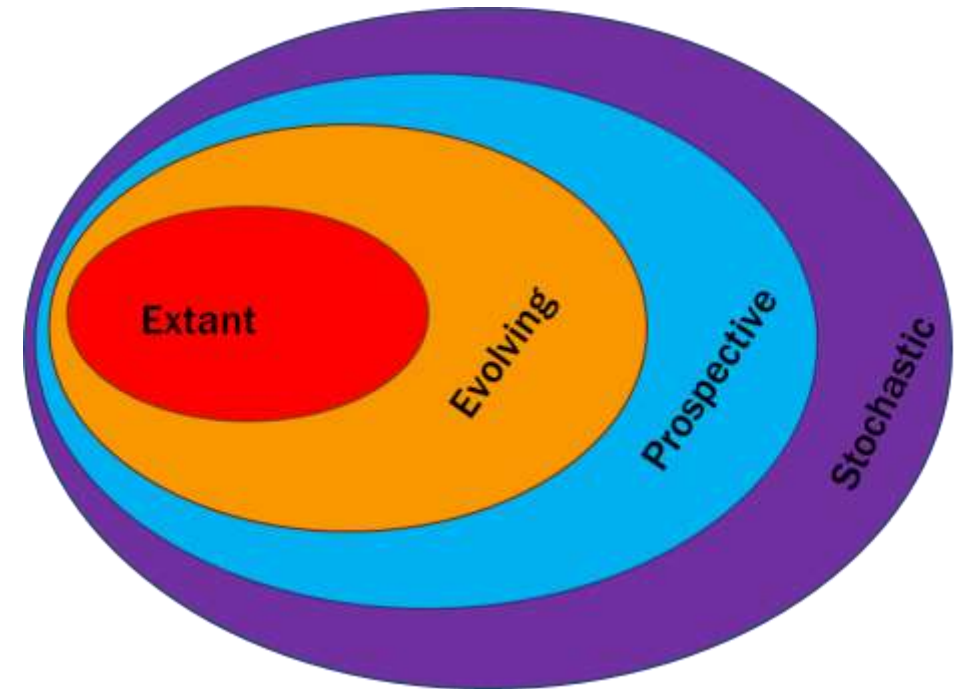
Unique Challenges

- Vast and diverse coastlines spanning multiple ecosystems
- Limited resources and capacity for maritime law enforcement
- Overlapping jurisdictions and sovereignty issues
- Rapid urbanization in coastal areas

TEMPORAL-PROBABILISTIC THREAT FRAMEWORK (MARITIME THREAT HORIZONS)

Each layer addresses a different level of certainty and immediacy, shaping a multi-dimensional approach to maritime security.

1. **Extant Threats:** Current, ongoing challenges (e.g. piracy)
2. **Evolving Phenomena:** Actively developing threats (e.g. use of advanced tech by criminal groups)
3. **Prospective Challenges:** Potential future threats (e.g. conflicts over marine resources due to climate change)
4. **Stochastic Disruptions:** Unpredictable, high-impact events (e.g. major oil spills, natural disasters)





MARITIME SECURITY STRATEGY

NATIONAL MARITIME SECURITY STRATEGY

The National Maritime Security Strategy is based on an analysis of our environment, reflects our maritime security interests and their vulnerabilities, establishes shared objectives and defines lines of action aimed at orienting the use of all available means to serving those objectives, both at the time of the response and in anticipation and forward planning.

- Mariano Rajoy (Spanish Prime Minister, 2011 -2018)



LIMITATIONS OF CONVENTIONAL APPROACHES

- Static in nature and unable to adapt to rapidly changing threats
- Siloed approach lacking cross-sector coordination (inter-agency coordination)
- Reactive rather than proactive
- Often focused on short-term political gains rather than long-term security



CHALLENGES IN THE AFRICAN CONTEXT

- Resource constraints limiting implementation
- Jurisdictional complexities within and between nations and agencies
- Difficulty in addressing transnational threat

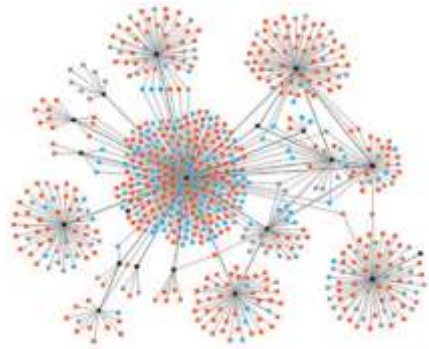




COMPLEX ADAPTIVE SYSTEMS

COMPLEX ADAPTIVE SYSTEMS THEORY

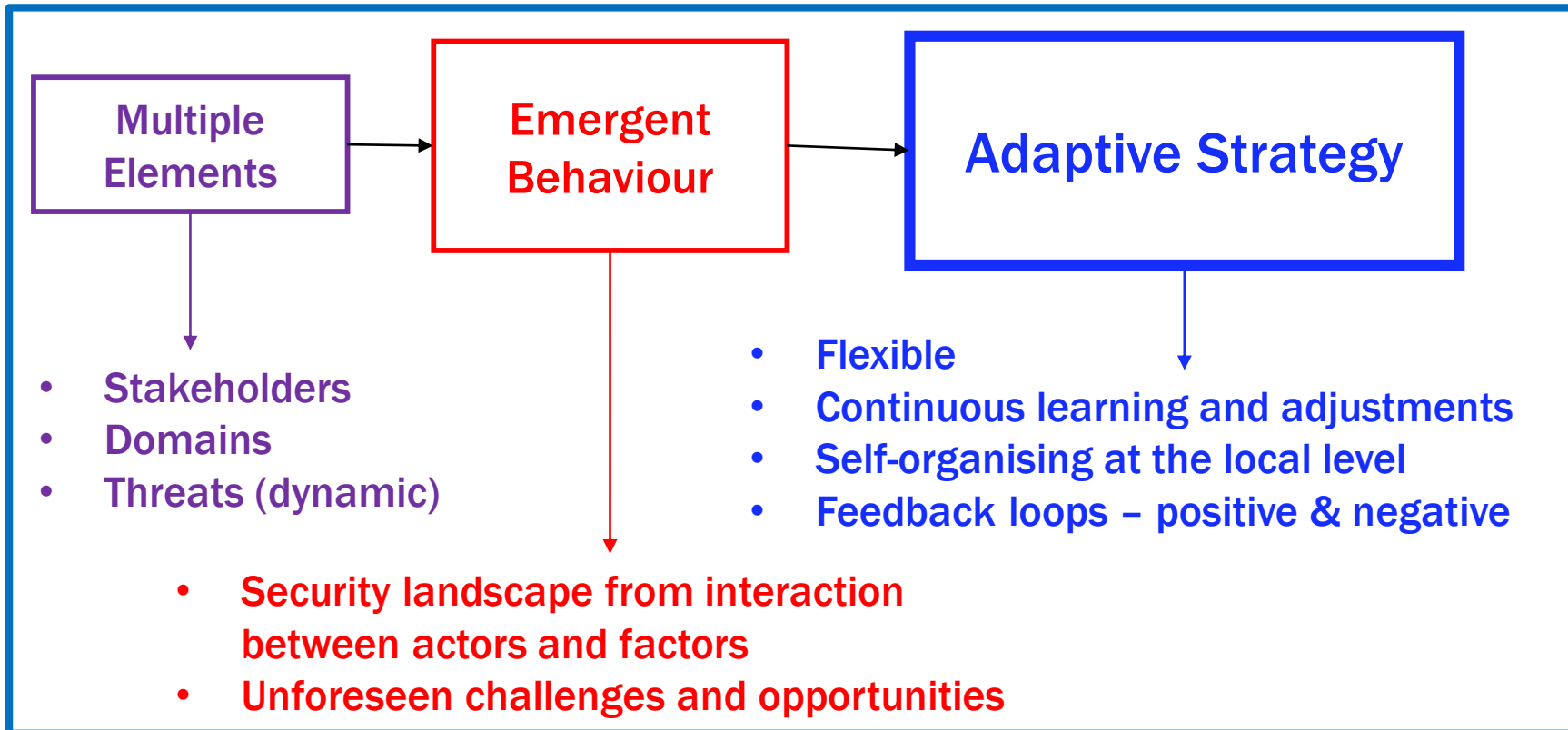
Systems made up of many interconnected and interdependent parts that adapt and evolve in response to changes in their environment.



Key principles:

- **Non-linearity:** Small changes can have disproportionate effects
- **Emergence:** New patterns arise from interactions within the system
- **Self-organization:** System components adapt without central control
- **Feedback loops:** Actions influence future system behaviour

COMPLEX ADAPTIVE SYSTEMS THROUGH THE LENS OF MARITIME SECURITY STRATEGY



MARITIME SECURITY (NESTED SYSTEM)

- Part of a larger system (national security)
- Contains subsystems – port, naval, maritime surveillance

- * No final state of security
- * Continuous process of adaptation and improvement

CAS & MARITIME SECURITY STRATEGY

How can CAS principles be applied to maritime security strategy?

1. Viewing the maritime domain as an interconnected system
2. Recognizing the adaptive nature of threats and security responses
3. Emphasizing flexibility and continuous learning in strategy development
4. Focusing on system-wide resilience rather than just threat prevention



ADAPTIVE MSS CORE PRINCIPLES

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1. Decentralized Decision-Making with Centralized Coordination

- Empower local actors to make rapid decisions based on their specific contexts within a broader strategic framework
- Maintain centralized oversight to ensure coherence and share best practices

ADAPTIVE MSS CORE PRINCIPLES

2. Iterative Strategy Development

- View strategy as an evolving document rather than a fixed plan
- Implement regular review and revision cycles including trigger points for strategy reassessment (e.g., after major incidents or significant changes in the threat landscape)
- Maintain core strategic objectives while allowing tactical flexibility

ADAPTIVE MSS CORE PRINCIPLES

3. Stratified Threat Assessment

- Conduct multi-layered assessments considering different threat horizons
- Regularly re/evaluate the threat landscape across all horizons
- Implement robust feedback mechanisms for continuous improvement
- Create "learning networks" across all stakeholders in the maritime security community

ADAPTIVE MSS CORE PRINCIPLES

4. Flexible Response Capabilities

- Develop modular and scalable response protocols
- Design threat category-specific response protocols
- Maintain a diverse set of tools and tactics to address various threat types
- Emphasize cross-training of personnel for multi-threat response

ADAPTIVE MSS CORE PRINCIPLES

5. Adaptive Resource Allocation

- Implement flexible budgeting mechanisms to quickly reallocate resources
- Invest in multi-purpose capabilities that can address various threat types
- Regularly reassess and adjust resource allocation based on evolving priorities

ADAPTIVE MSS

TECHNOLOGY-BASED ACTIVITIES

- 1. Development of a Real-Time Data Integration Platform**
- 2. Develop redundancy in key maritime infrastructure such as backup communication systems, alternative fuel supplies, etc**
- 3. Invest in research and innovation**

ADAPTIVE MSS FRAMEWORK

OPERATIONAL AND STRATEGIC ACTIVITIES

- 1. Pilot Programmes - Testing and refining strategies in smaller-scale settings.**
- 2. Regular drills and scenario-based simulations to test and improve the strategy (for each category of threat).**
- 3. Continuous Strategy Review Mechanism: reviews of operational performance, lessons learned from recent incidents, and any new intelligence or trends (quarterly or biannually).**

ADAPTIVE MSS FRAMEWORK

COLLABORATIVE AND COMMUNITY- FOCUSED ACTIVITIES

- 1. Partnerships: Building regional and international alliances.**
- 2. Regular Policy Forums and Conferences that bring together maritime stakeholders to discuss current challenges, share best practices, and explore emerging trends.**
- 3. Engage local communities, fishermen, and other stakeholders directly affected by maritime security.**

CASE STUDY:

SINGAPORE'S NATIONAL MARITIME SECURITY SYSTEM (NMSS)

- Established NMSS to provide a framework to facilitate the detection and monitoring of maritime security threats and the coordination of operational responses.
- Singapore perceives maritime security to include both traditional and non-traditional maritime threats.

Adaptive Elements

- National Maritime Sense-making Group uses AI and data analytics collected from multiple sources to generate unique signatures and build profiles for the close to a thousand commercial shipping vessels that pass-through Singapore's waters daily.

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Outcomes:

- A possible ISIS supporter was flagged on board a tanker in 2015 and barred from disembarking in Singapore.
- In 2016, a crew member was arrested on a merchant vessel that was flagged as suspicious and subsequently found to contain contraband goods.

CONCLUSIONS

Recap of key points

1. Evolving nature of maritime security in African waters.
2. Complexity in stakeholders, maritime domain and interactions.
3. Need for MSS's that are constantly evolving

Call to action:

- Invest in adaptive systems
- Enhance resilience through proactive measures capable of withstanding unforeseen events
- Foster cooperation at all levels (local, national, regional, international)
- Support research and innovation to build capabilities



**THANK
YOU**

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