



# SRI LANKA NAVY JOURNAL

December 2021  
Volume 07, Issue 1

NAVAL RESEARCH WING  
SRI LANKA



## **SRI LANKA NAVY JOURNAL**

Sri Lanka Navy Journal is a bi-annual publication which provides the opportunity to discuss matters relevant to Maritime, Strategic and global affairs. It serves as a potent medium for all serving members of the Navy to present ideas, express opinions and share insights on subjects of national and global importance whilst enabling them to improve writing skills and broaden the horizon of knowledge.

The journal publishes papers and articles of professional interest to the Sri Lanka Navy.

Articles published in this journal reflect only the opinions of the authors and not necessarily those of the Sri Lanka Navy.

Copyright of all published articles rests with the Editorial Board of the Sri Lanka Navy Journal.

Reproduction of the articles published, in whole or in part, may be done only with the written concurrence of the Chief Editor.

Sri Lanka Navy Journal is registered with the National Library and Documentation Services Board (NLDSB) under the International Standard Serial Number (ISSN) 2448-9409.

All Rights Reserved.





## **Editorial Board**

### **Chief Editor**

Captain(G) LC Vithanage, RSP, psn , MSc(WS) maritime

### **Editorial Committee**

Commander (C) DMS Jayathilake, RSP, psc, psn, MSc(D&SS), MSc(WS) maritime, BSc(DS)MTS

Lieutenant Commander (C) KJP Rohana , psc, MSc(D&SS), BSc(DS)MTS

Lieutenant (VNF) HMRG Herath, Sp.Trained. In English

### **Publication**

Sri Lanka Navy

Naval Research Wing

SLNS Gemunu

Welisara

Ragama

T:P - SSO (NRW)      011-7196502

E-mail: slnjournal@navy.lk

### **Printing**

Naval Printing Unit

SLNS Gemunu

Welisara

Ragama

Sri Lanka

All right reserved. No Material in this publication may be reproduced without the written permission from the publisher.

### **Disclaimer**

The views expressed and the informations contained in the papers included in this publication are the sole responsibility of the author/s, and do not bear any liability on the Sri Lanka Navy.

ISSN 2448 - 9409



## FOREWORD



It gives me an immense pleasure to introduce yet another issue of Sri Lanka Navy Journal, which brings new perspectives on matters pertaining to maritime domain, national security aspects and, more broadly of global affairs. This journal mirrors the level and quality of the work being performed by our officers as thriving researchers in multitude of disciplines. As the commander of the Sri Lanka Navy, I am proud and inspired by the way our officers have endeavoured to enrich existing knowledge in wide spectrum of subject matters.

By the very nature of our profession, critical thinking is an essential trait that every naval officer must possess which enables them effectively reaching critical decisions. Officers must learn and sharpen this trait through regular practice. This journal is a prodigious platform for our officers to enrich their thinking, researching and writing skills which are foremost essentials of a military leader. Thus, I encourage officers of all ranks and trades, to contribute high quality research papers which will be invariably helpful to elevate the acceptance of this journal.

I commend the editorial board for pulling together a timely and thought-provoking volume that brings together authors displaying a wide breadth of expertise not only with regard to the maritime context, but also with regard to much broader global affairs.

I congratulate all the authors whose manuscripts were published and extend special thanks for the contribution made by authors whose work were not published. I also underline my appreciation to two anonymous peer reviewers for their insightful remarks and suggestions.

While I hope this journal will raise interest among our regular readership of scholars and practioners elsewhere, I congratulate all those who contributed directly and indirectly to this effort. I convey my best wishes to all the members of this publication.

Thanks

DNS ULUGETENNE, RSP\*, VSV, USP, ndc, psc  
Vice Admiral  
Commander of the Navy



## Message from the Editor-In-Chief

It has been a great honour to forward this message to the 10<sup>th</sup> edition of Sri Lanka Navy Journal that publishes multidisciplinary, peer reviewed original research papers of Sri Lanka Navy personnel.

Sri Lanka Navy Journal provides a great platform for naval researchers to present and discuss various matters, issues and phenomena in wide range of disciplines whilst encouraging the aptitude for research. Without being limited by the traditional categorization of naval subjects, the journal encourages to present multidisciplinary research papers aiming to broaden mental faculties of naval personnel and readers of wider interests.

This edition of the SLNJ brings a collection of high quality research papers and two winning essays of annual Admiral Clancy Fernando essay competition conducted by Sri Lanka Navy. I am pleased to note that the number of manuscripts submissions is way up for this year compared to last year which is an indication of the growing interest of SLN personnel for research. The journal used double-blind review to ensure high level of transparency and bringing a wide collection of high quality research papers to the reader.

Finally, I wish to express my gratitude to the leadership of the Commander of the Navy for the guidance, and encouragement towards publication of this journal. In particular, I would like to send my best wishes to all authors including whose papers have been not published, reviewers, editorial board members, who have worked extremely hard to handle the reviews of submissions for this journal. Equally, I would like to thank the publication staff of Naval Printing Unit for their continued and substantial assistance with the successful launch of the journal in a timely manner.

The amazing support and continued efforts by everyone who contributed to ensure that the Sri Lanka Navy Journal is recognized as a leading journal is much appreciated.

While We always welcome Comments, suggestions and special issue proposals, I invite the fraternity of naval officers and interested academia to join us to work towards making the journal a truly influential publication.

Thank you.



## CONTENTS

### **ECONOMIC AND SOCIAL DEVELOPMENT IN SRI LANKA: THE WAY FORWARD**

01

Commodore (E) Hasantha Dassanaik, USP, psc, MDS, MPA(PIM-USJ), BSc(DS)Mar  
Eng(Hons), CEng(SL), CEng(I), MIE(SL), MIE(I), MCPM

### **PREPAREDNESS OF INDIAN OCEAN REGION FOR RESPONDING OIL SPILLS**

12

Captain(N) Buddhika Jayaweera, USP, psc, MDS, MSc in Maritime Affairs, PG Dip in IR,  
BSc(DS) Hons, MNI, MICS

### **UAVs IN MARITIME OPERATIONS, IT'S VIABILITY, CHALLENGES AND EFFECTIVE UTILIZATION ONBOARD SRI LANKAN NAVAL SHIPS**

19

Lieutenant Commander (N) Prashan Perera, psc, MCPS, MBM(UoC), BSc (DS) MTS,  
MIM (SL)

### **AMALGAMATION OF TECHNOLOGY WITH NAVAL WARFARE: THE EVOLUTION, EMERGING TRENDS AND PROSPECTS**

31

Lieutenant Commander (L) Rangana Bamunusinghe, MSc(Mgt), BSc (DS) EE Eng (Hons),  
CEng, MIE(SL), CEng(I), AMIE(I)

### **ROLE OF SRI LANKA NAVY IN FIGHTING PIRACY AND MARITIME TERRORISM**

42

Lieutenant Commander (ASW) Asanka Sanjeewa

### **SEA TURTLE PROJECT: WHAT WAS AND WHAT IS?**

56

Lieutenant Prageeth Sahan

### **FACTORS INFLUENCING GREEN HUMAN RESOURCE MANAGEMENT**

63

Lieutenant (S) Maduranga Nanayakkara

### **MARITIME SECURITY ISSUES IN THE INDIAN OCEAN REGION**

76

Lieutenant Pramod Liyanapathirana

**COMMANDER & ABOVE CATEGORY - 1<sup>ST</sup> PLACE**

**"READING MAKES A MAN PERFECT"- FRANCIS BACON. HOW CAN WE ACHIEVE THIS IN SLN WITH THE AIM OF BUILDING AN INTELLECTUALLY SOUND NAVY TO MEET THE GLOBAL STANDARDS**

84

Commander (G) Priyadarshana Udakumbura, RSP\*, USP, psc, Msc (D&SS), MA in DS (UK), BSc(DS)Hons

**LIEUTENANT COMMANDER & BELOW CATEGORY - 1<sup>ST</sup> PLACE**

**"READING MAKES A MAN PERFECT" - FRANCIS BACON. HOW CAN WE ACHIEVE THIS IN SLN WITH THE AIM OF BUILDING AN INTELLECTUALLY SOUND NAVY TO MEET THE GLOBAL STANDARDS**

94

Lieutenant Commander (MARINE) Sisira Kumara, psc







## ECONOMIC AND SOCIAL DEVELOPMENT IN SRI LANKA: THE WAY FORWARD



Commodore (E) Hasantha Dassanaik, USP, psc, MDS, MPA (PIM-USJ), BSc( DS) Mar Eng(Hons), CEng(SL), CEng (I), MIE (SL), MIE (I), MCPM

### Abstract

*Years 2019 and onwards had been a very crucial period for Sri Lanka due to the Easter Sunday terrorists attacks and the COVID-19 pandemic. As a result of the pandemic global activity is estimated to have contracted nearly 4.3% in 2020. The Sri Lankan economy was gradually recovering from the impact of the Easter Sunday terrorist attacks until we were affected from the global pandemic. Unavoidable declaration of holidays, restricted public services, curfew, shutdown of airports and seaports for a considerable period has affected several key economic sectors including much important tourism. The economic situation of the country is not conducive like most of other countries, with more and more Sri Lankan employees returning home from abroad understandably due to the pandemic situation, which has an immense impact on private remittances. Therefore, it is timely that we revisit and review our strategies and development plans to achieve satisfactory income and social progress for the people benefit of Sri Lanka.*

**Keywords:** Economy, Social Development, Governance, Policy, Challenges

### Introduction

Freedom of living anywhere in the Pearl of Indian Ocean was dawn again in May 2009 after defeating one of the most vicious and ruthless terrorist organisations in the world. This beautiful country suffered immeasurably under the jaws of brutal terrorism and started breathing a sigh of relief after the menace was defeated. Terrorism was the main obstacle for peace, economic and social progress for almost three decades in our beloved motherland, Sri Lanka.

However, aftermath, due to the Easter Sunday attack on 21<sup>st</sup> April 2019 targeting churches and luxury hotels killing more than 250 civilians including foreign nationals and injuring over 500 personnel by a local extremist group, and due to the outbreak of COVID-19 in late 2019 have had serious effects and substantial negative impact on economic activities in the country. While the containment measures adopted to curb the COVID-19 pandemic was satisfactory, the unavoidable declaration of holidays, restricted public services, curfew, shutdown of airports and seaports for a considerable period have affected several key economic sectors. Therefore, it is pertinent to review our strategies and development plans to achieve increasing income and social progress for the benefit of the people of Sri Lanka.

There was a satisfactory progress on post conflict transformation since May 2009, indeed due to the exemplary efforts on Reconstruction, Resettlement, Rehabilitation, Reintegration and Reconciliation (5R's) which laid the foundation for a prosperous future for all our citizens, irrespective of their diversity and differences. However, voice is continuously raised by segments of suffered communities, mainly to reassess and accelerate the process for the benefit of effected masses.

Over the last thirty years, at least a dozen of developing countries have experienced impressive economic growth. For many of the countries, especially in Asian region, the annual growth rate of Gross Domestic Product (GDP) is over 8%. Sri Lanka has not been able to sustain high growth over extended periods of time due to following main reasons; high revenue and expenditure deficits, high trade and current account deficits, disputes in land, labour and capital markets, traditional and bureaucratic institutions, cultural factors, governance structures, political instability in certain periods and corruption.

In this endeavour, considering globalization and challenges of the modern world, it is very much important to study the evolution of roles of governments in our country from post-independence; 1948 to 1977, 1977 to 2009, 2009 to 2019 and 2019 to date, to facilitate formulate the most prudent strategy for economic and social development in Sri Lanka.

## **Social Indexes**

Of issues covered by the Basic Human Needs Dimension, Sri Lanka does well in areas including nutrition and basic medical care and has the greatest opportunity to improve human wellbeing by focusing more on personal safety. Of issues covered by the foundations of Wellbeing Dimension, Sri Lanka excels at providing building blocks for people lives such as access to basic knowledge, however could benefit from greater investment in access to information and communications. Of issues covered by the Opportunity Dimensions, Sri Lanka outperforms in providing opportunities for people to improve their position in society and scores highly in personal freedom and choice yet falls short in personal rights. Sri Lanka's Social Progress Index is 73.20. That is 64<sup>th</sup> position out of 163 countries in year 2020 (Social Progress Imperative, 2020).

In 2020 Sri Lanka scored 38 points and is placed in the 94<sup>th</sup> position among 180 countries in the global Corruption Perception Index (CPI). Sri Lanka has remained in that position since 2017, which is a matter of serious concern (World Bank, 2020).

Further, as per economic and social statistics of Sri Lanka published by Central Bank of Sri Lanka (CBSL) 2020, Sri Lanka ranked 72 out of 189 counties with Human Development Index (HDI) value (2019) as 0.780. Our literacy rate (15 years and over) Male and Female is 93.4% and 91.6 % respectively.

Life Expectancy at birth 76.8% and Gender Inequality Index is 0.383. Sri Lanka's GDP at market prices is USD 84 billion (2019) with Per Capita GDP USD 3,852 (2019) and Growth of GDP 2.3% (2019). Since GDP growth was considered to be an inadequate indicator of development, United Nations system has finally settled on the Human Development Index (HDI) and it is based on Life Expectancy Index, Education Index, and GDP Index of a country.

Sri Lanka's position in 'Ease of Doing Business' index for year 2020 ranked to 99, up from 100<sup>th</sup> in year 2019, out of 190 economies across the globe (World Bank, 2020). However, to convince and empower investors require speedy approach for methodical formulation of flexible policies mainly to ease up paying taxes, getting electricity, registering property, and enforcing contracts. When we consider pattern of income distribution in the country as per the two basic indicators namely, the Lorenz Curve and Gini Coefficient, Sri Lanka's Gini Coefficients of household income, household expenditure and income receivers are 0.45, 0.41 and 0.51 respectively in year 2016 (The Government Budget and Fiscal Policy, 2020).

### **The Development Paradigm**

The phenomenal rise in living standards in countries like China, Singapore, Malaysia, and South Korea owes substantially to the rapid rates of economic growth in those countries. It is a fact that economic growth per se is not development. When we take the holistic view of development paradigm, economic growth is a necessary condition for development, and together with that there should be a symbiotic relationship with the state, civil society, private sector with the indispensable foundation i.e. Good Governance, namely, Vision, Transparency, Accountability, Equity, Productivity, Participation, and Predictability.

The post-independence era inherited the machinery of government that was utilized basically to satisfy needs of the metropolis. Studies reveal that there was an underlying perception that governance should focus more directly on providing economic and social services to the citizenry. Particularly, since 1956 the government has played an important role in promoting an indigenous industrial class. Nationalisation of the port, transport, plantations and the setting up of state owned enterprises, also meant that the government played an increased role as an entrepreneur.

Our motherland is privileged by its strategically important location in the midst of the ancient Maritime Silk Route. We have been in the spotlight of Western and Eastern merchants throughout history. With growing trade between Asia, Asia-Pacific and the rest of the world, island's geographic location has become even more important today, indicating its potential to develop as an international maritime and logistics hub.

The policy changes that occurred in 1978 contributed to further changes in the form of governance. A liberalized market economy emerged.

The private sector assumed the role of the main actor in economic activities. The nature of the responsibility of the government changed as a guide, facilitator, and a regulator.

### **National Policy Framework: Vistas of Prosperity and Splendour**

The present government which came into power in year 2019-2020 has forwarded the National Policy Framework (NPF) namely 'Vistas of Prosperity and Splendour'. It constitutes 10 key policies aimed at achieving the fourfold outcome of a productive citizenry, a contented family, a disciplined and just society and a prosperous nation. The 10 key policies as per the NPF are;

- Priority to the National Security.
- Friendly, Non-Aligned Foreign Policy.
- New Constitution that fulfills the People's Wishes.
- Productive Citizenry and a Vibrant Human Resource.
- People Centric Economic Development.
- Technology Based Society.
- Development of Physical Resources.
- Sustainable Environmental Management.
- Disciplined Law Abiding and Value Based Society.

As per NPF the 2020-2025 Macroeconomic targets are;

- To achieve an average rate of economic growth of 6.5 % or higher.
- Per capita income exceeding USD 6500.
- The rate of unemployment at less than 4 %.
- The rate of annual inflation not exceeding 5 %.
- Budget deficit at less than 4 % of GDP.
- A single digit rate of interest.
- To maintain the exchange value of the rupee at a stable level.

It is a fact that with huge political uncertainties, without the political confidence a government cannot go on or plan for progress. The creation of prosperity to the majority of people who cannot purely rely on market based solution, requires connectivity through roads, electricity, telecommunications, information technology, education and health services.

It is very much important to analyse social and economic indicators for last few years to date and reassess and review to achieve desired objectives. Main economic indicators obtained from Central Bank of Sri Lanka Annual Report (CBSLAR 2019) are tabled below;

**Table 1 : Key Economic Indicators**

Indicator/year	2013	2014	2015	2016	2017	2018	2019
Demography							
Labour Force Participation rate (%)	53.7	53.2	53.8	53.8	54.1	1.8	2.3
Unemployment rate (% of labour force)							
	4.4	4.3	4.7	4.4	4.2	4.4	4.8
Output							
GDP (bn USD)	74.3	79.4	80.6	82.4	87.4	88.4	84.0
Per Capita GDP (USD)	3609	3819	3841	3886	4077	4079	3852
Real Output (% change)							
GDP	3.4	5.0	5.0	4.5	3.6	3.3	2.3
Sectoral classification of GDP							
Agriculture	3.2	4.6	4.7	-3.7	-0.4	6.5	0.6
Industry	4.1	4.7	2.2	5.7	4.7	1.2	2.7
Services	3.8	4.8	6.0	4.8	3.6	4.6	2.3

**Source : CBSL Annual Report 2019**

On analysis above Table 1, despite the increment of labour force participation from 51.8% in year 2018 to 52.3% in year 2019, the unemployment rate has increased by 0.4% in year 2019 in contrast to 2018. Further, there is a considerable drop in GDP and per capita GDP in year 2019. Further, there are concerns on decline in agriculture and service sectors in year 2019 which need to be addressed early.

As per statistics, our economy rebounded satisfactorily in 2015 with an annual real GDP growth of 5%, however, due to the effects of the pandemic and other effects it has reduced to 2.3% in year 2019. While inflation which remained at single digit levels for considerable years has reached 4.4% in year 2019. The trade deficit contracted sharply in 2019 with the reduction in import expenditure. The significant reduction in import prices and a marginal increase in export prices resulted in an improvement in the terms of trade in 2019.

**Table 2 : Key Economic Indicators**

Indicator/Year	2013	2014	2015	2016	2017	2018	2019
External trade							
Trade Balance (mn USD)	- 7,609	-8,287	-8,388	-8,873	-9,619	-10,343	-7,997
Exports	10,394	11,130	10,546	10,310	11,360	11,890	11,940
Imports	18,003	19,417	18,935	19,183	20,980	22,233	19,937
Outstanding Gov- ernment Debt							
Government Debt/GDP %	24.5	10.3	22.5	12.1	10.0	16.1	9.9
Domestic Debt/ GDP %	41.0	42.2	46.2	45.3	42.5	42.3	44.1
Foreign Debt/ GDP %	30.9	30.0	32.4	33.7	35.4	41.5	42.6
Changes in Price Indices (annual % change)							
CCPI (2013=100) annual average			2.2	4.0	6.6	4.3	4.3
GDP Deflator (2013=100)	6.2	2.9	0.6	4.8	7.3	4.3	2.2

**Source : CBSL Annual Report 2019**

The trade deficit contracted sharply in 2019 with the reduction in import expenditure. The significant reduction in import prices and a marginal increase in export prices resulted in an improvement in the terms of trade in 2019 (Table 2).

Foreign and Domestic Debt to GDP percentage in 2018 is 83.8% and it has increased to 86.7% in 2019 (Table 2). Sri Lanka is no more a poor country since we surpassed USD 1000 per capita income and we are now a lower middle income country. So there is a tendency for more commercial borrowings since we are not eligible for concessionary funding. Further, there is a concern that both revenue account and overall budget are in considerably high deficits.



Sri Lanka's foreign debt issue, which will often, leads to serious Balance of Payment (BOP) issues.

**Table 3 – Provincial Gross Domestic Production 2019**

Year/province	West- ern	Central	South- ern	North- ern	East- ern	North- West ern	North Central	Uva	Sabrag- amu- wa
2018	39.6	11.7	10.1	4.1	5.6	10.5	5.6	5.5	7.3
2019	39.1	11.5	9.9	4.7	5.7	10.7	5.4	5.4	7.6

**Source : [www.cbsl.gov.lk](http://www.cbsl.gov.lk)**

Provincial GDP share (percentage) is presented in Table 3. It shows the unequal income distribution among provinces in our country. Almost half of the country's GDP is produced in the Western and Central provinces. There are slight changes in the last few years in Northern, Eastern, Northwestern and Sabaragamuwa provinces showing improvements with the expansion of economic activities in these provinces which are a positive sign.

As reported by both Central Bank and Ministry of Finance in their Annual Reports, the key public enterprises, mainly, Ceylon Petroleum Corporation (CPC), Ceylon Electricity Board (CEB), Sri Lankan Airlines, Sri Lanka Transport Board (SLTB), and Sri Lankan Railways (SLR) have to alter their courses to minimize losses and contribute to strengthen the national economy.

In addition, evidences suggest that the mega infrastructure projects which the subsequent governments have started recently out of foreign non concessional borrowings need to be put to the best commercial use to generate a regular and sufficient flow for repayment of such loans.

### **Millennium Development Goals and Sustainable Development Goals**

The Government and the people of Sri Lanka after pledging support to achieve 08 Millennium Development Goals (MDGs) in year 2000 had progressed commendably in achieving the targets by year 2015. Having successfully achieved MDGs in 2015, Sri Lanka reaffirmed its commitment by refining national policies and strategies, which have greatly facilitated the achievement of its 17 Sustainable Development Goals (SDGs) along with 192 other member states of the United Nations. Furthermore, Sri Lanka has already enforced the Sri Lanka Sustainable Development Act, No.19 of 2017, which provides for the development and implementation of a national policy and strategy on sustainable development. The 2030 SDGs agenda has facilitated Sri Lanka to enrich its path to sustainable development through an approach that complements economic, social, and environmental dimensions of development.

## The Way Forward

*“Good Governance is perhaps the single most important factor in eradicating poverty and promoting development.”*

Kofi Annan, former UN Secretary General

## Good Governance

The fundamental task of the public service is to promote development. Development is sustained with the support of four main pillars namely macroeconomics, infrastructure, production, and human resources. It is obvious that if one pillar breaks or not strong enough, ‘development’ will not sustain. Hence, the solid foundation for all these is largely based on the elements of ‘Good Governance’. Therefore, it is indispensable to respect and promote principles of Good Governance for economic and social progress in our country.

- **Vision.** Execute government vision for a new Sri Lanka by empowering all stake holders with concrete policies, plans, and programmes for implementation.
- **Equity.** Provide conducive environment with respect to, equal access to opportunities for all. Unequal income distribution among provinces should be minimized. Confidence should be built among communities to contribute for the development through participation and enjoy the dividends of development for all segments.
- **Ethics.** Promote culture to be proud of serving the nation as a whole and not individuals or group of people. Further it is essential to provide set stage for attitudinal change, moral behaviour, discipline and dedication on to duty.
- **Accountability.** The principal aim of accountability is to prevent corruption. Hence, strict adherence to formulated rules and regulations which exist for public officials to follow ethical standards and account for their actions are essential.
- **Transparency.** Mechanism should be formulated to make government rules, regulations, policies, and decision making processes accessible and visible to the people. Any government elected should recognize and respect the right of citizens to information.
- **Predictability.** Laws, rules, procedures and policy decisions, once adopted need to be followed diligently. To change these in midstream will discourage the investors as return on their investment cannot be predicted.

On the other hand, uncertainty regarding the application of regulations raises the cost of capital by the increasing the risk of investment.

- **Participation.** This is the very essence of good governance. The governance is the result of interaction among governments, private sectors, and civil societies. Hence, building internal, grass root, and macro level partnerships are essential to achieve desired economic and social aspirations of our country.
- **Productivity.** Local government should implement decisions and follow processes that make the best use of the available people, resources and time to ensure the best possible results for their community. Productivity is a combination of effectiveness and efficiency.

### **Fulfil Prerequisites Prior Investing**

Sri Lanka having turned to a lower middle income country no more enjoys the privilege of receiving grants and concessionary borrowings. The market borrowings we receive today on non-concessionary terms involve interest rates around 6.25% with shorter maturity period of 4 to 6 years. Repayment of these borrowings mostly in a single shot called 'bullet repayment' and practically insignificant grace periods, usually one year (Wijewardena, 2014).

Therefore, it is absolutely necessary to conduct sound feasibility studies, environmental assessments, and cost benefit assessments and use such market borrowings for projects that generate an adequate income in foreign exchange to repay these loans, while adding net wealth to the country. This golden rule should not be overlooked to prevent our country falling into a debt trap which is experienced by countries like Greece and Ireland recently.

### **Tax Reforms**

Tax system has not delivered the potential tax revenue as expected. Despite the economic growth and increase of GDP, revenue has declined from 13.4% of GDP in 2018 to 12.6% in year 2019 as per CBSL statistics. The key reasoning has been the non-broadening of the tax base when income has increased. The four main reasons for such decline could be multitude of tax exemptions, tax evasions, discretionary tax measures and weak tax administration.

Further, our direct to indirect tax ratio of around 20:80 at present has burdened low income people. The ideal ratio for countries like Sri Lanka is 60:40 as per the economic literature available. In addition there are about 25 different taxes in operation at present and suggest same be studied and reduced to a

manageable and affordable level.

Therefore, it is recommended to appoint a suitable Presidential Commission as done in year 2009, to reassess and propose best tax reforms for a sustainable economy.

## Conclusion

The main causes of the ongoing economic situation are found in structural weaknesses such as the contraction of trade, lack of foreign direct investment, and the low tax revenue. Delay in providing comprehensive and consistent, long-term solutions to address such weaknesses mainly have resulted in the country running into serious Balance of Payment crises.

The present government National Policy Framework (NPF) namely 'Vistas of Prosperity and Splendour', recognizes that Sri Lanka cannot rely on economic growth alone. The country also has to ensure that its people have equitable access to infrastructure, services and economic opportunities, so they can take full advantage of the fruits of public and private investments. The Government's aim in the NPF is to preserve Sri Lanka's cultural values and traditions while developing a knowledge-based economy with better living standards for everyone. The solid foundation required for all desired aspirations are to create culture based on principles of Good Governance.

It is timely that to reassess economic policies and chart a new course towards pragmatic policies to achieve sustainable economic and social development in our motherland Sri Lanka.

## REFERENCES

Annual Report 2019, Central Bank of Sri Lanka, Colombo, 2020.

Annual Report 2019, Ministry of Finance, 2020.

Corruption Progress Imperatives, available at <https://www.socialprogress.org/static> (Accessed on 19 April 2021). Corruption Perception Index, available at <http://www.transparency.org/en/cpi/2021> (Accessed on 19 April 2021).

Ease of Doing Business, available at <https://www.doingbusiness.org> (Accessed on 22 April 2021). Human Development Report, UNDP 2020, Sri Lanka, available at <http://www.hdr.undp.org> (Accessed on 22 April 2021).

Karunaratne, S.A., 2014, Macroeconomic Framework, Colombo, Post Graduate Institute of Management. Social Progress Imperative (2020) 'Social Progress Index', Choice Reviews Online, 53(03), pp. 53-1089-53-1089. doi: 10.5860/choice.192006.

Social Progress Imperatives, available at <https://www.socialprogress.org/static> (Accessed on 19 April 2021).

The Government Budget and Fiscal Policy (2020).

Vistas of Prosperity and Splendour, Ministry of Finance Sri Lanka 2019.

Wijewardana, W.A., 2014, The Government Budget and Fiscal Policy, Colombo, Post Graduate Institute of Management.

World Bank (2020) Sri Lanka - Transparency.org. Available at: <https://www.transparency.org/en/countries/sri-lanka> (Accessed: 22 April 2021).

## PREPAREDNESS OF INDIAN OCEAN REGION FOR RESPONDING OIL SPILLS



Captain (N) Buddhika Jayaweera, USP, psc, MDS, MSc in Maritime Affairs, PG Dip in IR, BSc(DS)Hons, MNI, MICS

### Abstract

*Indian Ocean is very vital not only for its littoral countries, but also to the whole world. The importance of trade and the sheer scope of its many sub-regions make the Indian Ocean critical in terms of economy, military and strategic engagement. It is a vital trading hub, connecting the Middle East to Southeast and East Asia, as well as Europe and the Americas. Any disruption along its trading routes which carry two thirds of the world's oil shipments will impact the entire globe's energy security. As far as regional countries are concerned, all of them are economically and socially highly connected and dependent on oceanic affairs and marine resources. Increase of shipping, particularly transport of petroleum products and oceanic activities poses a risk of marine pollution in the Indian Ocean. Therefore, regional countries should take greater care and commitment to keep Indian Ocean free from pollution and make sure sustainable management of its resources. This paper discusses the risk of marine pollution posed by oil spills in the Indian Ocean Region highlighting two recent maritime accidents of MT New Diamond and MV Wakashio, and regional preparedness in responding to oil spills.*

**keywords:** Oil Spills, Indian Ocean, Maritime Pollution, Maritime Resources

### Introduction

Indian Ocean is the third largest ocean woven together by trade routes; command and control of major sea-lanes carrying half of the world's container ships, one third of the world's bulk cargo traffic and two thirds of the world's oil shipments i.e. some 36 million barrels per day (U.S Energy Information Administration, 2014). Thus, the Indian Ocean remains an important life-line to international trade and transport. Also, it is the home to nearly 2.7 billion people, whose shores are washed by the ocean and also their economies are by and large based on maritime economic activities. Further, the Indian Ocean is rich in natural resources and diverse marine eco systems. Forty per cent of the world's offshore oil production takes place in the Indian Ocean basin (Central Intelligence Agency, 2021). Due to the high dependency on oceanic affairs, all Indian Ocean Rim Association (IORA) countries should be committed to keep Indian Ocean free from pollution and sustainable management of its resources.

The governance and security of the Indian Ocean are under constant threat of being undermined, whether by non-state actors such as pirates, smugglers, and terrorists, or by furtive naval competition between states (Dhruva Jaisankar, 2016). International Maritime Bureau continues to report the territorial states and offshore waters as high risk for piracy and armed robbery against

ships. On the other hand, the Indian Ocean Region (IOR) is sometimes called the “World’s Hazard Belt” as it is prone to disasters, both natural and man-made (IORA, 2021). With this very reason IORA has rightly identified Disaster Risk Management as a priority and focus area. In this context, occurrence of large scale maritime accidents cannot be ignored due to high density of shipping and other threats. This paper discusses about the preparedness of IOR for maritime disasters particularly oil spills from ships.

## **Threat of Oil Spills**

Nations of IOR face an existential and developmental threat from ship-source pollution endangering their vulnerable marine ecosystems and ocean economies. During last six month itself (IOR) has experienced one oil spillage from bulk carrier MV Wakashio off the coast of Mauritius and two narrow incidents of possible spills from MT New Diamond and MV Eurosun South-Eastern Coast off Sri Lanka.

The MV Wakashio, a Panamanian-flagged bulk-carrier, was sailing when it grounded on a coral reef on 25<sup>th</sup> July last year in an environmentally sensitive and bio- diverse area off the East coast of Mauritius. Thirteen days later, the ship began breaking apart, releasing fuel oil over an area of 27 km<sup>2</sup> and poisoning a major marine reserve and internationally recognized wetlands. According to the UNCTAD between 1,000 and 2,000 tons of fuel oil had reportedly leaked from a breached tank and drifted into the surrounding lagoon, including areas of mangrove. The government of Mauritius declared a state of environmental emergency, even though had little capability of its own to respond. The government, NGOs, fishermen and local volunteers sought to contain the spill using small tourist boats, fishing vessels and homemade oil booms made from clothing, plastic bottles and dried sugar-cane leaves. The spill is considered as the worst in the history of Mauritius. It has endangered coral, fish and other marine life, imperiling the economy, food security, health and the \$1.6 billion tourism industry in the country (LLOYD’S Maritime Academy, 2021).

MT New Diamond case is different. Although there was no significant oil spill, the threat of possible oil spill due to fire onboard is caused huge concern worldwide. MT New Diamond is a Very Large Crude Carrier (VLCC) which was transporting 270,000 metric tons of crude oil from the port of Mina Al Ahmadi in Kuwait to the Port of Paradip in India when a fire broke out aboard in the Eastern seas of Sri Lanka on 03<sup>rd</sup> September 2020 (MI News Network, 2020). It was also reported that 1,700 metric tonnes of diesel required for the use of the tanker is stored onboard. The fire erupted with an explosion in a boiler in the ship’s main engine room and it caused to abandon the ship. At the time of incident, MT New Diamond was operated by 23 crew members including 5-Greeks and 18 Philippine nationals. 19 crew members who were boarded



to lifeboat were rescued by the commercial vessel Helen M and three by Sri Lanka Navy ship which landed a rescue party aboard New Diamond. A Filipino crew member died in the fire and one person who sustained burn injuries was admitted to the Hospital.

A joint team from Sri Lanka and India managed to put out the fire by 11<sup>th</sup> September 2021, thanks to their prompt and strenuous firefighting effort, contain a leak of fuel oil, and secure the cargo of 270,000 tonnes of crude oil, averting a potentially catastrophic disaster. Rescue operations had grown to more than a dozen ships from Sri Lanka and India, while the Sri Lanka Air Force had carried out 176 missions to drop about 440,000 litres of water and 4,500 kilograms of fire suppressing chemicals. A 10 to 30 metres wide and about a nautical mile long fuel patch was spotted in the sea which had been caused by small leaks from the ship's fuel tanks. It has not caused considerable impact to the marine environment as it emulsified rapidly due rough seas.



**Figure 1 : Fighting Fire on the MT New Diamond**

**Source : Developed by Author**

The successful management of the incident, which also received special attention worldwide, paved the way to avert one of the worst marine environment disasters that could have occurred, had not it was mitigated in short period of time. Also this could have been second only to oil tanker Atlantic Empress incident in terms of amount of spill and the impact is not restricted to the Sri Lanka, but to many neighbouring nations.

Sri Lankan government took the legal action against the owner of MT New Diamond on grounds of violating its environmental protection laws. The captain of MT New Diamond, Stereo Sterio Ilias, was charged in the Colombo High Court by



the Sri Lankan Attorney General of causing an oil spill and violating the Marine Environment Protection Authority Act, with a fine of 1 million USD sought; the court decreased the fine to 65,000 USD and Ilias was released after paying. The ship owner was charged 2.4 million USD for the firefighting effort, which the company paid as a condition of towing MT New Diamond out of Sri Lankan waters (Wikipedia, 2021).

## **Lesson Learnt**

The fire onboard MT New Diamond, however was well handled, has exposed the need for an improved regional cooperation among nations in the Indian Ocean Rim to handle threats posed by man-made disasters particularly accidental oil spills from ships through a unified and coordinated response. Followings are the main areas that need attention of IORA.

- a. **Effectiveness of Regional Oil Spill Contingency Plans.** It is true that number of sub regional oil spill contingency plans exist to corporate in the field of oil and chemical pollution preparedness and response within the IOR, such as South Asia Contingency Plan, South East Asia, Western Indian Ocean and Western Indian Ocean Islands. The objective of these contingency plans are to organize a prompt and effective response to oil spills affecting or likely to affect the area of responsibility of one or more of the countries concerned and to facilitate their co-operation in the field of oil and chemical pollution preparedness and response (South Asian Cooperative Programme, 2016). However, the level of implementation of these plans is a question. It is to mention that more than 10 years took adopt South Asian Regional Contingency Plan and still it is not fully operational.
- b. **Responsibility of Shipping and Petroleum Industry.** When considering high density of shipping and amount of oil transporting through the IOR, the shipping and petroleum industry also should have responsibility to support the oil spill preparedness and response efforts of individual countries as well as sub regions in the IOR. In fact, the industry maintains a response system to ensure that full preparations have been made for oil spill incidents by stockpiling oil spill response equipment and lending when required upon request and providing consultancy services. One such example is Oil Spill Response Ltd. The question is whether industry engagement within IOR is sufficient particularly in South Asia, West Asia and Eastern and Southern Africa?

c. **International Conventions on Liability and Compensation Regimes.**

As mentioned earlier, the Mauritius oil spill is a tragic reminder of the environmental threats posed by maritime transport and there is an urgent need for all countries to adopt the international conventions that govern the sea. Also, complex natures of International rules on liability and compensation regimes are matter of concern. Although the same oil causes the environment damage, applicable international legal convention differs with the kinds of ship that spilled the oil. Compensation for spills of persistent oil carried in tankers are governed by the 1992 Civil Liability Convention (CLC), the 1992 Fund Convention and the 2003 Supplementary Fund Protocol which today represent the most advanced and modern legal instruments in the field (UNCTAD, 2012). These legal regimes did not apply in the case of the Mauritius spill, which was caused by a bulk-carrier rather than an oil tanker. In such cases, the International Convention on Civil Liability for Bunker Oil Pollution Damage (Bunkers Convention) applies, yet the level of overall compensation under this regime is relatively small and dependent on many as yet unanswered legal questions. According to the United Nations Conference on Trade and Development (UNCTAD), in the case of the MV Wakashio (101.932GT), the maximum compensation for economic losses and costs of reinstatement of the environment would be about \$65.17 million. If it were an oil tanker, the applicable International Oil Pollution Compensation Funds regime could have provided compensation of up to \$286 million. This is more than four times the Bunkers Convention provision and for Mauritius, could mean less financial aid to restore the environment and economic activity in the wake of the spill (UNCTAD,2020) Unfortunately, some of the littorals in the IORA have not become party to above mentioned conventions which deprive obtaining benefits associated with them.



**Figure 2 : MT New Diamond Vs MV Wakashio**

**Source: Developed by Author**

Having identified different issues that are linked with ship source oil spills, regional bodies such as the IORA must take on a more proactive role in addressing and responding to these challenges that small and littoral states find very difficult to meet.

## **Recommendations**

Following recommendations are suggested to strengthen capabilities of Indian Ocean Region littorals to respond oil spills in order to protect rich and diverse marine environment, and their economic interests.

- The mechanism of Regional Oil Spill Contingency Plan is a very good tool for providing mutual support both in maintaining preparedness and response to any oil spills. It also ensures a common understanding and effective integration between affected and assisting member countries, in the event of incidents involving oil spills. Therefore, IORA should take a lead to push these regional contingency plans be more active and operationalize to meet ever increasing economic and environmental impacts due to spill risks.
- Lack of resources and technological expertise are challenges to the IOR in handling medium and large scale (Tier II and Tier III) spills. Therefore, this is the right time to force industry to establish more stockpiles in convenient locations of IOR; ideally in Sri Lanka considering the density of shipping traversing the IOR in close proximity to Sri Lanka.
- An effective international legal regime that could provide support with less complex legal proceedings when ship-source environmental disasters strike. Also encourage the IORA countries those have not ratified existing conventions to ratify them and put them into force to grab the benefits and to avoid creating murky waters when oil spills occurs.

## **Conclusion**

Risk of oil spills in the Indian Ocean region is relatively high due to the mere fact that two-third of global oil shipments are traversing and Forty per cent of the global offshore oil production takes place in the Indian Ocean basin. As the littorals are by and large dependents of the ocean for their economic interests, protection of it and keep free from pollution is crucial. Therefore, maintaining highest level of preparedness and having adequate response capabilities are utmost important to mitigate impact of oil spills. This inevitability requires more attention and priority of individual states and regional bodies such as IORA.

Finally, while appreciating the work of IORA, it is worth to highlight that there needs to be regionally organized efforts aimed at improving cooperation,

communication and response capabilities inclusive of a pool of resources and experts who are ready to respond in an emergency of an oil spill at national and regional levels. These measures could help the creation of 'home-grown' solutions appropriate for the region.

## REFERENCES

Central Intelligence Agency (2021) Indian Ocean - The World Factbook. Available at: <https://www.cia.gov/the-world-factbook/oceans/indian-ocean/> (Accessed: 5 May 2021).

Dhruva Jaishankar (2016) 'Indian Ocean region: A pivot for India's growth', Brookings. Available at: <https://www.brookings.edu/opinions/indian-ocean-region-a-pivot-for-indias-growth/> (Accessed: 25 October 2021).

IORA (2021) Indian Ocean Rim Association (IORA). Available at: <https://www.iora.int/en> (Accessed: 12 May 2021).

LLOYD'S Maritime Academy (2021) Wakashio Spill Shows Need for Indian Ocean Environmental Partnership, The Maritime Executive. Available at: <https://www.maritime-executive.com/editorials/wakashio-spill-shows-need-for-indian-ocean-environmental-partnership> (Accessed: 16 May 2021).

MI News Network (2020) MT New Diamond Not Permitted To Leave Sri Lankan Waters Before Settling Claim, Marine Insight. Available at: <https://www.marineinsight.com/shipping-news/mt-new-diamond-not-permitted-to-leave-sri-lankan-waters-before-settling-claim/> (Accessed: 15 May 2021).

South Asian Cooperative Programme (2016) 'SACEP REGIONAL OIL AND CHEMICAL POLLUTION CONTINGENCY PLAN FOR SOUTH ASIA', pp. 1-108.

U.S Energy Information Administration (2014) International - U.S. Energy Information Administration (EIA), World Oil Transit Chokepoints. Available at: [https://www.eia.gov/international/analysis/special-topics/World\\_Oil\\_Transit\\_Chokepoints](https://www.eia.gov/international/analysis/special-topics/World_Oil_Transit_Chokepoints) (Accessed: 10 May 2021).

UNCTAD (2012) 'Liability and Compensation for Ship-Source Oil Pollution', United Nations Conference on Trade and Development, p. 76.

UNCTAD (2020) 'Mauritius oil spill puts spotlight on ship pollution', 19th august. Available at: <https://unctad.org/news/mauritius-oil-spill-puts-spotlight-on-ship-pollution> (Accessed: 25 October 2021).

# UAVs IN MARITIME OPERATIONS, ITS VIABILITY, CHALLENGES AND EFFECTIVE UTILIZATION ONBOARD SRI LANKAN NAVAL SHIPS



Lieutenant Commander(N) Prashan Perera, psc, MCPS, MBM (UoC), BSc (DS) MTS,  
MIM (SL)

## Abstract

*Unmanned Aerial Vehicles (UAVs) are critical for Intelligence Surveillance and Reconnaissance (ISR) operations in the global maritime domain. In the current scenarios, it can be seen that regional and extra-regional navies have begun to establish, upgrade, and maintain shipborne UAVs to expand their ISR reach. The geostrategic location of Sri Lanka in the Indian Ocean has resulted in the evolution of maritime safety and security concerns such as chemical spills, on-board fires, marine pollution, marine accidents, Search and Rescue (SAR) operations, piracy, and transnational crimes such as illegal, unreported, and unregulated (IUU) fishing and drug/human smuggling. These challenges have had a significant negative impact on Sri Lanka's ability to develop as a maritime hub and lead to the blue economy. Due to financial constraints, the Sri Lanka Navy (SLN) faces setbacks in becoming a medium regional force projection Navy by 2025. However, due to various economic and maritime safety and security aspects, ISR requirements in the SL maritime domain have multiplied. As a result, this study focuses on the viability, challenges, and effective utilization of UAVs in available SLN seagoing platforms for maritime ISR operations, comparing effective experiences of regional and extra-regional navies by addressing its importance in maritime operations. The research data was gathered and analyzed qualitatively using published literature surveys. Purchasing maritime UAVs that can be operated from SLN ships, according to the findings, is the most cost effective and timely solution for imminent ISR operations in the maritime domain.*

**Keywords:** Unmanned Aerial Vehicle, Intelligence Surveillance and Reconnaissance, Effective Utilization, Viability

## Introduction

Sri Lanka (SL) holds an important place in maritime geography because it is straddled in the centre of the Indian Ocean, where major sea routes connect many major seaports from the East to the West of the world (Senaratne, B., 2016). Furthermore, the Indian Ocean Region (IOR) maritime trade accounted for more than half of the world's seaborne oil and two-thirds of containerized cargo (Kannangara, P. Collins, A. & Waidyatilake, B., 2018). The SLN and the Sri Lanka Coast Guard (SLCG) are tasked with ensuring maritime safety and security in the seas surrounding Sri Lanka. The threshold for maritime safety and security has risen dramatically, resulting in one of the world's major sea routes passing-

just 6 nautical miles South of Sri Lanka. According to SLN's Maritime Strategy (2025), Sri Lanka has been entrusted with 200nm of the seashore as an exclusive economic and pollution-prevention zone, which is eight times the landmass. Furthermore, Sri Lanka is responsible for safeguarding a search and rescue region of 1,738,062.24 km<sup>2</sup>, which is 27 times larger than its landmass. According to Daniel (2018), the SL search and rescue system is ineffective and requires significant improvement. Mohanty et al. (2015) identified key aspects of the Indian Ocean region's (IOR) 'Blue Economy,' including food security, tourism, maritime trade, and the challenges of exploiting shared ocean resources. Senaratne (2017) also stated that the country has begun to implement dynamic changes in economic activities to transform Sri Lanka into a regional hub in the Indian Ocean.

As a result, to overcome the aforementioned challenges, national security policies must prioritize the enhancement of maritime safety and security. Furthermore, the 'Sri Lanka Navy's Maritime Strategy 2025' has identified illegal, unreported, and unregulated fishing, chemical spills, marine pollutions, marine accidents and search and rescue operations, transnational crimes of drug/human smuggling as some of the challenges that the SLN is facing; as a result, the SLN strategy must focus on full-scale ISR. However, the ten large platforms available in SLN are insufficient to cover the vast sea area for surveillance and reconnaissance. The scarcity of bigger ships for continuous patrolling has caused weaker security in the maritime domain of Sri Lanka (Liyanagamage, 2018). On the other hand, the SLN goal of building '20 ships navy' by 2025 in the effort of making a medium regional force projection navy will not be able to accomplish as scheduled due to financial constraints. As a result, now is the time to investigate the viability of operating shipborne Unmanned Aerial Vehicles (UAVs) onboard SLN platforms to enhance the surveillance and reconnaissance reach and effective use of major sea assets based on the inputs received by the sensors of UAVs to fill the gaps in maritime safety and security aspects. Sri Lanka Army also has established its 15<sup>th</sup> drone regiment in Sri Lanka Artillery in November 2020 by understanding technological advances for its land operation (Army, 2020). Therefore, the right utilization of onboard UAVs would assist SLN to maintain effective ISR patrols in the vast sea area as a remedy to the challenges mentioned above.

## **Background and Evolution of UAV Technology**

The Italian city of Venice had been attacked by Austrians in 1849 by using 200 unmanned balloons loaded with bombs fitted with timer devices. It has considered the first unmanned combat air vehicle (Prisacariu, n.d) and (Tetrault, 2019). Thereafter, the concept of UAVs was used in the American Civil War from 1861 to 1865 and the first reconnaissance UAV the 'FIREBEE' has used in Vietnam War (1959-1975).



The modern UAV originated in the early 1970 and designers in the United States and Israel started experimenting with smaller, slower and cheaper UAVs (McKinnon, 2014).

During the period of the Second World War and throughout the Cold War, technological advancement of the UAV continued. It's regarded that both the United States and the USSR used UAVs to spy on each other during the Cold War (Martinez, 2019). However, modern UAV warfare began in early 1982, when Israel coordinated the use of battlefield UAVs alongside manned aircraft to wipe out the Syrian fleet with very minimal losses (IWM Staff, 2018). Since then, UAVs have been utilised by both military and civil missions at large (Martinez, 2019).

### **Effective Employment of UAVs by Extra-Regional and Regional Navies**

UAVs were successfully employed by the US Navy in early 1984 in the role of forwarding spotters for naval gunfire and artillery support to the US troops in Lebanon. Later US Naval UAVs performed a surveillance mission against narcotics in Latin America in 1987. Further, UAVs carried out a successful action in the Persian Gulf during the operation "Desert Storm" (Kurkcu, C. and Oveyik, K., 2008).

Regional navies in South and Eastern Asia has already taken measures to procure and also to develop autonomous UAVs not limited to intelligence surveillance and reconnaissance, but also for invasive missions with disruptive capabilities due to the tense situation in the IOR and the South China Sea. Further, the enhancement of asymmetric threats in the ocean and high tech weapon smuggling through the sea has led navies to improve maritime domain awareness by using artificial intelligence. It has been reported that China has invested approximately \$ 10.5 billion in acquiring 41,000 UAVs from 2014 to 2023 (Singh, 2016).

Singh (2016) further, enumerated the Indian Navy capabilities and its readiness for UAV operations as the country has established 3 land based UAV squadrons for coastal surveillance operations in Kochi, Porbander and Ramana-thapuram. In addition to that, Kulshreshtha, M. (2020) highlighted that the Indian Navy plan to establish at least two more squadrons of UAVs which is operated from ships to enhance the range of ISR. Therefore, the Indian Navy has had an ambition of operating 50 Shipborne UAVs for ISR. Furthermore, these land-based UAVs control has been planned to take over by the shipborne Datalink for ISR missions and UAVs control back to shore unit for recovery (Kulshreshtha, 2020). However, the Indian Navy has leased two Sea Guardian drones in November 2020 before ordering 10 shipborne unarmed UAVs before upgrading its existing UAVs to boost maritime surveillance and reconnaissance capabilities and these UAVs are deployed at larger warships (Writer, 2021).

According to the explanation (Dominguez, 2020), the Pakistan Navy was in the process of inducting "LUNA NG" unmanned aerial vehicles as their fleet's air arm in the year 2020. This effort aimed to improve the navy's ISR capabilities in the maritime domain, particularly along the coast. Malaysia, Indonesia, the Philippines, and Vietnam have signed a \$48 million contract with the US Department of Defence under the Maritime Security Initiative (MSI) to acquire 34 low-altitude, highendurance ScanEagle UAVs to patrol wide strategic routes along the Malacca Strait, the South China Sea, and the Sulu Sea. The Malaysian Navy purchased 12 Scan Eagle UAVs for the US \$ 19 million, and such unarmed 06 Scan Eagle UAVs were delivered in mid-November 2019 (Landau, 2019) & (Vavasseur, 2021). The following are some of the important roles and missions performed by ship-borne UAVs in other navies;

- Wide Area Surveillance.
- Provide Over the Horizon Targeting (OTHT) Data.
- Surveillance and Reconnaissance.
- Battle Damage Assessment.
- Obtain Real-Time Imagery of Area or Objects of Interest.
- Surveillance of EEZ, Fishery Protection.
- Maritime Patrol in the Coastal Area.
- Merchant Traffic Monitoring.
- Assistance in SAR Operations.
- Coastal and Maritime Installation Protection.

### **Importance of UAVs in ISR and Maritime Operations Around Sri Lanka**

Sri Lanka is an island nation that is strategically located in the IOR, where major powers rivalries have focused their attention and interest in the IOR in the upcoming Asian century (Jayathilake, 2017). Because of the aforementioned reasons, and because Sri Lanka will be developed as a maritime nation with vast responsibilities in sea areas, it should be more concerned with ensuring maritime safety and security around its ocean to build a peaceful and conducive environment. As a result, the SLN, along with the Sri Lanka Coast Guard (SLCG), must play a critical role in national and international security as the first line of defence. Thus, within the framework of naval warfare, effective intelligence gathering and air reconnaissance have always been important in ensuring peace. Therefore, the government of Sri Lanka have to have serious concerns on gathering information



more efficiently in the maritime domain to ensure the security aspects in the IOR.

In a war, non-traditional maritime security threats scenarios or peacetime naval operations, it is mandatory to have a real-time reconnaissance and intelligence gathering to enable the theatre commander to plan his operations. Due to the scarcity of larger seagoing platforms and problems of agility, UAVs have been developed to carry out multifarious functions. Therefore, undoubtedly UAV operations are significant and could be performed by operating through SLN platforms for real-time day and night reconnaissance and surveillance over the horizon, observation of foreign naval and commercial activities within SLN jurisdiction, monitoring of transnational crime activities around seas, real-time guidance to search and rescue operations, monitoring of busiest sea traffic areas, etc. Hence, the introduction of cost-effective and most ideal UAVs would provide the best answer to the requirement of timely intelligence.

### **Viability in Utilization of UAVs Onboard SLN Ships for ISR**

UAVs were used more towards ISR duties during its inception but, as of today its capabilities have steadily increased to provide greater endurance, larger coverage area and able to provide a recognized maritime picture with the shortest possible time via shared pictures or live video and more importantly, it has reduced greater risk and fatigue to the pilots. Hence, SLN can enhance its capacity to obtain real-time information by employing UAVs onboard available platforms.

### **Launch and Recovery Methods of Shipborne UAVs**

Key concerns to be catered in operating UAVs onboard ships are launching and the recovering procedure. Vertical takes off and landing (VTOL) UAVs create a very little impact on the helicopter deck either in launching or recovery after landing. Some larger UAVs of this category need a cradle (rail mounted on the deck) for recovery and the same will help to transfer the UAV from the helideck to the hanger. As elaborated by Eriksson, M. & Ringman, P. (2013) VTOL UAVs can be landed and launch under rough sea condition provided that it has an Aircraft Ship Integrated Secure and Traverse (ASIST) or Light Harpoon Landing Restraint System (LHLRS) and further, enumerated that fixed-wing UAVs have a lot of restrictions in both take off and landing. Since offshore patrol vessels, corvette and frigate are having very limited space, these UAVs uses assisted take-off mechanisms such as rocket-assisted take-off (RATO), bungee cord, hydraulic launchers and pneumatic launchers. Same as launching, recovery is also significant onboard ships due to limited space. Net recovery is one of the straight solutions and techniques in UAVs flying with a controlled speed onto a vertically mounted net for prompt landing. The skyhook recovery system is another option in which flying UAV into the vertical catching wire and hook on to leading

wingtips. Other than that, the parasail recovery method and recovery by landing in water is widely used (Eriksson, M. & Ringman, P. 2013).

SLN currently has 7 ships equipped with a helicopter deck. As a result, SLN might look into options like the Neptune UAV, which can be launched from these ships and recovered by landing on the water. The Neptune category storage container is being used for the launcher itself. Because its engine and avionics are located well above the waterline and the airframe is sealed for flotation as well as corrosion/water intrusion protection, it could be one of the best options for SLN ships (Pearson, F.C 2006). Another small fixed-wing UAV, the Boeing Scan Eagle, which is currently used by the US, Malaysian, and many other navies, is a viable option for use in SLN ships because it is launched from a pneumatic catapult and recovered by flying into a protected net above the waterline. Tilt Rotor UAVs with Vertical Take-off and Vertical Landing (VTOL) are also suitable for existing naval platforms.

### **Ship Control Stations and Resource Personnel**

Then, the next important aspect is whether SLN is in a position to fulfil command and control consoles (Ships Control Station) and human capital which is mandatory for the above operation. When considering the ship control stations, it is a matter of transferring technology after careful study (pre-survey) in the available ship's spaces and fixing reliable equipment through the diplomatic acquisition process. Then, another most essential part is the human capability to operate and maintain UAVs. But currently, SLN does not have knowledgeable personnel with skills. Thus, it is very much essential to conceptualize a talent management system to adapt and bridge the gap of practical utilization and theoretical aspects firstly selecting, technical crew and operational crew as two sets of teams appropriate to platforms available in the year 2025 thereafter, one set of a team is to be sent for a fully customized UAV operation course in foreign (Preferably UAV acquiring country) following a diplomatic channelling. Until then, the remaining team could attach to Sri Lanka Air Force (SLAF) to undergo UAV training since the only local experienced stakeholder is SLAF. Once a foreign team has completed their training, the two teams can be swapped, and a budgetary allocation can be made to purchase at least six UAVs to form the first air surveillance and reconnaissance squadron to cover shipborne assets distributed in the Western, Southern, and Eastern naval areas.

### **Budgetary Requirement for UAVs as Compared SLN Latest Acquisitions**

The acquisition cost of Sindurala and Sayurala Advanced Offshore Patrol Vessels (AOPV) was 66.55 million USD per vessel, with spares costing 5.13 million USD and additions and alterations costing 1.27 million USD each. Furthermore, the cost of SLNS Gajabahu's operationalization was approximately 15 mil-

lion USD. A tactical unarmed shipborne latest UAV with default payload, on the other hand, would cost around 1-3 million USD, for example, Fire Scout, Neptune, Scan Eagle, Picador, Skeldar, and so on. As a result, when compared to ships, the cost of a reasonably modern UAV is quite low. Therefore, policymakers must be carefully convinced of those UAVs' capabilities in maritime operations and their advantages over ships with the experience of regional and extra-regional navies. As a result, the acquisition of UAVs on a much lower budget will ease the ISR role entrusted to ships proposed to be acquired by 2025 as part of the SLN maritime strategy.

### **Upgrading and Modifications for Larger Ships and Organization**

Existing SLN platforms must be modified to begin UAV operations, and the following are some of the key changes that must be implemented.

- For the ships which are having a helicopter hanger, a separate area can be allotted in the hanger to store a UAV whereas, ships that are not having a helicopter hanger must design a safe area to store a UAV onboard.
- Modifications for storing fuel for the usage of UAVs.
- Fire fighting arrangements must be systematized as to the emergencies that are likely to face during the launching and recovery of a UAV.
- Familiarisation of ship's crew with flight operations.
- Establishment of Command and Control System (CCS).
- Establish necessary arrangement for UAV launching and recovery procedures.

### **Why and How does Sri Lanka Navy Utilize UAVs**

SLN and SLCG are the major government agencies responsible for maritime safety and security in Sri Lanka. Even though enormous roles and tasks are entrusted to the shoulders of both organizations, they both lack sea-going assets and technologically advanced equipment. The Sri Lankan Search and Rescue region is 27 times the landmass of the United States. However, there are about 10 such capable platforms that are available for SAR operations. Once such distress information is received by the Navy's Maritime Rescue Coordinating Centre (MRCC), it will direct one of its vessels to the general area, but locating the distressed boat or raft will be difficult. Therefore, according to Karpowicz (2018), if SLN were equipped with shipborne UAVs with Visual Detection and Ranging (VIDAR), it would be much easier to spot with agility and large-area sensing.

Other than that, in other naval operations such as IUU fishing, illegal poaching, drug trafficking, etc., only a few large vessels can be kept on patrol, allowing shipborne tactical UAVs to carry out surveillance and reconnaissance operations based on the initial intelligence or demarcated areas. Therefore, other vessels and craft can be kept ready in the harbour whilst UAVs are engaged in dull operations, which will prevent unnecessary fatigue for seagoing vessels. Once the reconnaissance pictures are analyzed by the mother ship, other ships can be directed for special missions. UAVs would ease up another difficult task of providing evidence with greater accuracy and legally accepted ways for law enforcement agencies. Then again, UAVs can be utilized more effectively in maritime safety operations such as oil spill monitoring, against maritime pollution and observation of ship fires. Further, more systematic ship monitoring can be performed by interlink with the AIS system in the Sea Lines of Communications (SLOCs). Hence, UAVs can act as a force multiplier, managing the very limited sea-going assets optimally.

Acquisition of UAVs initially for ISR duties would ease the huge workload entrusted on SLN and SLCG further; this would enable to have better awareness about other maritime operators' intentions as information warfare. In summary, the requirement for the utilization of UAVs by the Sri Lanka Navy is to achieve the following cost-effective utilization since the existing surface fleet does not suffice to meet the demanded requirements.

- To protect maritime borders to avoid smuggling and illegal immigration.
- To provide immediate assistance to ships in distress.
- To minimize fuel consumption of SLN ships and craft.
- To monitor transnational crimes around vast seas.
- It can be utilized as an intelligence resource.
- As early warning air observatory craft in utilizing most suitable units as SLOCs protection naval units.
- To augment harbour and maritime installation protection operations.

### Challenges for UAV Deployment

- **Weather.** Because UAVs are very sensitive to adverse weather conditions, they might experience many problems. Water leaking into the system can cause damage or failure in command and control guidance, with payload sensory issues being the inability to operate in heavy rain. Other than that, UAVs are likely to face considerable restrictions during take-off

and recovery owing to a lack of wind envelope or due to crosswind conditions.

- **Vulnerability.** Even though UAVs are small in size, after the first detection they could be more vulnerable than manned aircraft because ISR UAVs operate at low speeds with steady courses for maximum effective. Further, it will not be able to react to the situation as a pilot in the situation. So it has more vulnerability against more sophisticated counterattacks, mechanical failures, and also losing control to more powerful control consoles/jamming.
- **Shipborne UAV Restrictions.** Limited take-off and recovery procedures and related problems such as the likelihood of damages may be causing to UAVs at the time of launching and recovery are considerable except VTOL, UAVs.

### **Collision Avoidance and Satellite Communication System**

The lack of a proficient collision avoidance system onboard SLN ships will impact the safe operation of UAVs. Therefore, a vertical height ceiling can be adopted to mitigate the above collision issue. Developed countries are using dedicated military satellite communication data links with much higher bandwidth to establish precise connectivity from a very long distance. However, SLN will be facing rudimentary issues relating to VHF communication, bandwidth, and its range limitations, and therefore, that has to be carefully investigated in detail before acquisition when compared with the communication facilities of shipborne UAVs that are available in regional and extra-regional navies. Apart from the above-mentioned challenges, there are numerous limitations embedded in UAV operations. Some of the key limitations are enumerated below;

- Restricted payloads.
- Speed.
- Endurance.
- Reliance on ground stations for data-link reception.
- A restricted ability to react for tactical situations in the air.
- As UAVs become more reliable, they may be allowed to fly in the same airspace as civilian aircraft, which they cannot do it currently.

## Conclusion

It can be seen that many regional and extra-regional well-developed navies have recently entered into shipborne UAV operations owing to many reasons such as cost-effectiveness, agility, free of risk and real-time imagery of the multisensoring UAV platforms. When compared to other nations, Sri Lanka's maritime role in terms of maritime safety and security are significant in the IOR because several traditional and non-traditional threats can endanger Sri Lanka and its national interests. Furthermore, there are significant maritime safety concerns with the recent maritime accidents and fires onboard. Therefore, it demands the vigilance of SLN. There are several ways and means to carry out effective ISR. However, being a third-world developing country, Sri Lanka cannot afford a huge amount of money from its security budget to purchase large seagoing platforms. Whatsoever, the requirement for effective maritime ISR has become an urgent and compelling issue considering SL blue economic interests, SAR responsibilities, maritime safety and security concerns, and the power rivalries of global actors in the IOR.

UAVs have become more agile, risk-free, multisensory and the most economical information communicable platform with the latest technology at present. Meanwhile, it could reduce the workload of people in manifolds. Therefore, understanding a few challenges and the best utilization of UAVs at available larger platforms would be a mandatory requirement to address the nourishing maritime safety and security issues in the maritime domain of Sri Lanka. Therefore, Sri Lanka should uplift its ISR capabilities with the right acquisition of suggested UAVs by establishing a shipborne UAV surveillance squadron. Therefore, SLN is at the right time to venture into shipborne UAVs by correct purchasing to ensure maritime safety and security more precisely, reliably, and effectively to achieve the country's maritime strategy.

## Recommendations

As per the analysis, recommendations are as follows;

- Carry out a comprehensive survey to check the most feasible launching and recovery mechanism of UAVs mentioned in the paper for onboard SLN platforms.
- Procuring at least 06 tactical UAVs to form a UAV squadron as per the budgetary allocation which can be facilitated on board ships for its operations and included same into Sri Lankan naval strategy.
- Select aviation crew and provide comprehensive training regarding UAVs operations and maintenance in a foreign country through diplomatic channelling.

- Obtain specialized advice to create required facilities for UAV operations onboard such as command and control stations with all required equipment for effective communication.

## REFERENCES

Army, S. L. (2020, November 12). New 15<sup>th</sup> Drone Regiment of the Sri Lanka Artillery Inaugurated to Meet with Future Challenges. Retrieved April 24, 2021, from Army.lk: <https://www.army.lk/news/new-15th-drone-regiment-sri-lanka-artillery-inaugurated-meet-future-challenges>.

Asian Development Bank. (2011). Asia 2050: Realizing the Asian Century. Mandaluyong City: Asian Development Bank.

Dewan, J. P., and Deawn, J. P. (2005) How Will the Indian Military's Upgrade and Modernization of Its ISR, Precision Strike, and Missile Defense Affect the Stability in South Asia.

Daniel, R. (2018). Moving Towards a More Successful Maritime Search and Rescue (Sar) System in Sri Lanka: Learning from Japan SAR Model. Academia.Edu.

Dominguez, G. (2020, January 10). Pakistan Navy inducts LUNA NG UAVs and second ATR-72 MPA. Retrieved May 08, 2021, from Janes.com: <https://www.janes.com/defence-new/news-detail/pakistan-navy-inducts-luna-ng-uavs-and-second-atr72-mpa> II, C. P. (2006). The Way Ahead For Maritime UAVs. Newport: Joint Military Operations Department, Naval War College, USA.

Indian Navy (2020)'Customer: Indian Navy. Available: at <https://www.indiannavy.nic.in/content/uav> (Accessed: 22 May 2021).

IWM Staff (2018) A Brief History of Drones | Imperial War Museums, IWM. Available at: <https://www.iwm.org.uk/history/a-brief-history-of-drones> (Accessed: 12 May 2021).

Karpowicz, J. (2018, AUGUST 09). Commercial UAV News. Retrieved May 18, 2021, from 4 Ways Drones are Being Used in Maritime and Offshore Services: <https://www.commercialuavnews.com/security/4-ways-drotime-offshore-services>.

Kulshreshtha, M. (2020, March 20). Evolution of UAV Squadrons of Indian Navy to Combat Ready Force in the Indo-Pacific. Retrieved May 04, 2021, from FinancialExpress: [https://www.financialexpress.com/defence/evoution-of UAV Squadrons of Indian Navy to Combat Ready Force in the Indo Pacific](https://www.financialexpress.com/defence/evoution-of-UAV-Squadrons-of-Indian-Navy-to-Combat-Ready-Force-in-the-Indo-Pacific).



Kurkcu, Coskun & Oveyik, Kaan. (2008). U.S. Unmanned Aerial Vehicles (UAVs) and Network Centric Warfare (NCW): Impacts on Combat Aviation Tactics from Gulf War I Through 2007 Iraq. 159.

Landau, E. (2019) 'US gives 12 maritime surveillance drones to royal Malaysian navy', News Strait Times. Available at: <https://www.nst.com.my/news/nation/2019/06/494531/us-gives-12-maritime-surveillance-drones-royal-malaysian-navy> (Accessed: 22 May 2021).

Marcus Eriksson, Patrick Ringman. (2013). Launch and recovery systems for unmanned vehicles onboard ships. A study and initial concepts. Centre for Naval Architecture.

Martinez, K. (2019) The History Of Drones (Drone History Timeline From 1849 To 2019), Dronethusiast. Available at: <https://www.dronethusiast.com/history-of-drones/> (Accessed: 18 May 2021).

McKinnon, G. D. (2014). The Birth of a Drone Nation: American Unmanned Aerial Vehicles Since 1917. Louisiana State University and Agricultural and Mechanical College.

Kannangara, P. Collins, A. & Waidyatilake, B. (2018) The Importance of the Indian Ocean: Trade, Security and Norms. Retrieved May 05, 2021, from Lakshman Kadiragamar Institute of International Relation and Strategic Studies: <https://lki.lk/publication/the-importance-of-the-indian-ocean-trade-security>.

Pearson, F.C, (2006). The Way Ahead For Maritime UAVs. Newport: Joint Military Operations Department, Naval War College, USA.

Prisacariu, V. (N.D.). The History And The Evolution Of Uavs From The Beginning Till The 70s . Dresmara.Ro, 9.

Save the Royal Navy (2015) Unmanned Platforms & the Royal Navy – Part 1 Aerial

Systems | Save the Royal Navy, Save the Royal Navy. Available at: <https://www.savetheroyalnavy.org/unmanned-platforms-the-royal-navy-part-1-aerial-systems/> (Accessed: 22 May 2021).

Senaratne, Bhagya. (2016). Maritime Safety and Security Challenges: A Sri Lankan Perspective.

Senaratne, A. (2017, 07 21). Oceans and Sri Lanka's future: Towards a blue economy. Retrieved 04 27, 2021, from [www.ft.lk](https://www.ft.lk): [https://www.ips.lk/wp-content/uploads/2017/03/FT\\_07June\\_Oceans-and-Sri-Lanka-future.pdf](https://www.ips.lk/wp-content/uploads/2017/03/FT_07June_Oceans-and-Sri-Lanka-future.pdf).



## AMALGAMATION OF TECHNOLOGY WITH NAVAL WARFARE: THE EVOLUTION, EMERGING TRENDS AND PROSPECTS



Lieutenant Commander (L) Rangana Bamunusinghe, MSc (Mgt), BSc (DS) EE Eng (Hons), CEng, MIE (SL), CEng (I), AMIE (I)

### Abstract

*Conflicts at sea or large water bodies were irrupted as soon as human being began to use them. The earliest recorded confrontation has occurred between Cyprus seafarers and the King of Hittites in ancient Anatola in 1210 BC. Since then, such conflicts were developed all over the world including the Mediterranean Sea, Europe and the Asian region. Due to the necessity of maintaining stability while floating and protection of own forces while countering enemy attacks, technology was highly integrated with naval shipbuilding and related activities. Hence, the evolution of naval warfare was highly amalgamated with the evolution of technology throughout history. The invention of gunpowder, torpedo, steel hull system, submarines, steam and nuclear-propelled turbine are significant milestones that impact the strategies used in naval warfare. A drastic change and development of technologies have been observed in the late modern era in history due to the Industrial Revolution, Colonization, World War I and II and in Cold War era. At present, instead of conventional warfare with moreover symmetric legitimate navies, threats from asymmetric opponents have become more vital and common. Responding to natural and manmade calamities also has become one of the important tasks frequently assigned to navies. Other than the traditional concern on domination of air, surface and subsurface, at present, the command over the cyber domain, space and comprehensive control over information warfare have become emerging trends yet necessities in naval warfare. Being an island nation located at a pivotal point in the Indian Ocean with considerably large sea areas under her jurisdiction, Sri Lanka's concern over emerging trends and prospects relevant to technological development and its integration into naval warfare is paramount important to be analyzed in-depth to avoid pitfalls in future.*

**Keywords:** Naval Warfare, Technology, Emerging Trends, Evolution

### Introduction

Human conflict and combat have occurred since the beginning of human beings for various reasons. Those were mainly on land whereas limited access they had to the sea or large water bodies. As soon as they began to use the water mass, conflicts were irrupted at sea. The earliest recorded confrontation has occurred at the Mediterranean Sea in 1210 BC with Cyprus seafarers and Suppiluliuma II, the king of the Hittites in ancient Anatola (Beckman, 2010). Since then, naval warfare was a more dynamic element mainly due to the inherent difficulties and complexity of the medium and the greater integration

of technology which developed rapidly.

Despite of limited survived written documents on strategic and technological involvement and evolution of naval warfare at the early stage, a fair assessment and understanding can be taken by available historical remains all over the world during early modern and succeeding eras. The evolution of naval warfare in the recent past mostly depends on technological evolution such as the development of platforms, weapons, machineries and other equipment. Hence, it is essential to closely understand, monitor, and evaluate naval technological development to anticipate or foresee the shape of the evolution of naval warfare in the future. Accordingly, this article will apprehend the influence and impact of technological development on naval warfare and its futuristic formation with due concern on its relevance to Sri Lanka.

## **History and Evolution of Naval Warfare**

Many scholars have amply discussed the history of naval warfare, its evolution, and technological integration during ancient, medieval, early and late modern eras in following different geographical areas (Lautenschlager, 1984) (Warming, 2019).

- The Mediterranean Sea.
- Europe (including West Asia and North Africa).
- Asia (East South and SouthEast Asia including China).

Due to the complexity and highly dynamic nature, the late modern era can be further explained as per the centuries. Despite the era or the geographical zone, the cruelty of the naval battle remains high whereas men on-board perish by the water and by fire. Hence, the concern to build advantageous platforms, devastating arms and ammunition than the enemy created an unceasing rivalry. An aristocratic Roman adviser Publius Flavius Vegetius Renatus has adequately described the above nature long ago in the late 4th and early 5<sup>th</sup> century AD in his book *Epitoma rei militaris* (or *De re military*).

The history of Persian sea campaigns began in the 5<sup>th</sup> Century BC with their Greek opponents. The Spartans' victory of the Peloponnesian War in 431 BC fought with Athens was mainly due to the Spartans' strategy to encircle Athens by cutting off the supply chain via sea with Greece. The naval warfare was greatly engaged in this battle and subsequent battles were fought in the same region between Athens and Spartans (Thucydides, 1893). The Battle of Actium (31 BC) was another prominent confrontation and considered the last naval battle in the Roman Civil War and used mounting catapults and fighting towers (Lange, 2011).

The Byzantine-Arab Wars in 7<sup>th</sup> Century BC recorded the first involvement of the Arab fleet in naval warfare and since then, they dominated the Mediterranean Sea and developed their strategies more favour with distance fighting.

The torpedoes with rocket systems having three firing points and filled with explosive gunpowder were enhanced their fighting capabilities at sea in the 13<sup>th</sup> Century (Wilkin, 2020).

Naval confrontations in the Asian region were limited mainly to nullify the resistance arise from opponents to their trades and diplomatic voyages. They were commenced in the 6<sup>th</sup> century AD with Chinese Sui and Tang dynasties and reached to West Asia and East Africa regions. Chinese were more powerful yet peaceful by the mid-15<sup>th</sup> Century under the leadership of well-known Chinese seafarer Admiral Zhen He who was involved in a conflict, defeated and abducted the Sri Lankan King (Wei, 2014).

Some of the significant naval expeditions and maritime affairs recorded in the history of Sri Lanka are as follows;

- The arrival of Thapassu Balluka traders in 6<sup>th</sup> century BC.
- The arrival of Indo-Aryan Prince Vijaya with 700 of his men in 6<sup>th</sup> Century BC.
- The arrival of Sangamittha Thero to Dambakolapatuna in the 3<sup>rd</sup> Century BC.
- Egyptian writer Plini's records on Sri Lankan shipbuilding capability of carrying 75 tons (3000 amphora) and beyond in 1<sup>st</sup> BC (Cassim, 2018).
- The records of Arabian geographer Al Idris (1115 AD) on large ships produced by Sri Lanka.
- Records in chronicles such as Mahavamsa, ship symbols and word 'navika'(Sailors) depicted in Duwegala, Paramankada and Maligatenna inscriptions (Cassim, 2018).
- Invasion of Indian rulers and establishing their control in Anuradapura, Polonnaruwa and subsequent kingdoms in Sri Lanka.
- Invasion of Chola territory, the liberation of the 12,000 Sinhala prisoners detained during his father's reign by King Gajabahu I (113 – 135 AD) and seized Chola prisoners in return (Ratnatunga, n.d.).
- Successful military campaigns of King Parakramabahu I (1123 – 1186 AD) via sea against South Indian Pandyans and the King of Ramanna in lower Burma.

The ship design technology was developed with much larger ships with safety measures and protections to crew and attack capabilities to enemy targets during the medieval era in the Asian region. Further, they were equipped

with much better navigational equipment. The naval power of the Chinese Ming Dynasty defeated the Portuguese Navy which was the powerful Navy by the early 16<sup>th</sup> century in the Indian and the Pacific Oceans and has commenced to colonize Sri Lanka and India by that time (Hao, 2011).

Instead of domestic wars mainly in internal wars and fighting between neighbours at littoral waters using Cogs in the early modern era, naval warfare was transferred to high seas with larger ships and more sophisticated weapons during the late modern era. Most of the Western countries were involved with sea expeditions and continuous conflicts occurred among them at sea. President George Washington's Naval Armament Act of 1794 to construct 6 frigates, enhanced fighting capabilities and human resources of the US Navy was a significant attempt in naval history and warfare (Naval History and Heritage Command, 2019).

The views of naval classical thinkers, strategists and historians including American strategist Alfred Thayer Mahan (1840-1914), British Naval historian Sir Julian Corbett (1854-1922), French General Antoine Henri De Jomini (1779-1869) and Prussian General Carl Von Clausewitz (1780-1831) on sea power and its influence to the world order were greatly affected to evolve the naval warfare in the late modern era (Geisler, 2015) (Vego, 2009).

### **Amalgamation of Technology with Naval Warfare**

Floatable constructions with proper stability and the ability to withstand adverse weather conditions itself a marvel of technology in an era before thousands of years. Other than the transportation of hundreds of men to the battlefield away from their own country, these voyages preserved the surprise and became a burden to the opponent. Subsequently, the confrontations at sea were commenced. At the initial stage, such battles were limited to boarding and anti-boarding activities with close-quarter combats using infantry arms and later with the amalgamation of technology they were developed further.

### **Technologies Used before Common Era**

The complexity of the naval warfare was further enhanced, when it reached the full-scale battle at sea due to the use of exceptional seaborne equipment and arms which were superior and furious to the armaments used in land warfare (Warming, 2019). The remains of Pharaoh Ramesses III highlight the use of manned fighting tops probably as observation points, grappnels to capsize the enemy vessels during the Battle of the Delta in 1175 BC between Egyptians and the Sea Peoples (Drews, 2020).

## **Developments in Early Middle Age**

New warship designs with high freeboards and highly elevated fighting platforms to get the advantage for men onboard in close-quarter combat were introduced. The cog (a type of ship) can be considered as an important technological design with a high freeboard, crow's nest (constructed in the upper part of the mainmast and used as a lookout point), large forecastle and aftercastle with a boarding facility as well as capability to repel the attacks. In the late 9<sup>th</sup> century rowing by manpower was replaced with sailing propulsion systems. The caravel and carrack ships were designed subsequently and they were more stable than cog with better speed (Konstam, 2002).

## **Impact of Invention of Gunpowder**

Naval warfare was drastically changed from the Bronze Age to the Early Middle Age due to the extensive use of fire. The aftermath of the invention of gunpowder in the 9<sup>th</sup> century in China, by 14<sup>th</sup> century they were spread in Eurasia and were sooner used in naval warfare with English Royal Ship the All Hallows Cog by 1338 AD (Friel, 1995). However, the use of gunpowder was extensively increased only in the 15<sup>th</sup> century as anti-personal weapons but not for the sinking of ships. The incident of sinking ships using guns was recorded during the Anglo-French sea confrontation in 1513 AD and during the Battle of St Mathieu between English and France fleets (Warming, 2019). Since then, the use of this technology was widely developed.

The investigation done in the year 2019 at the wreck of Swedish warship Mars sunk during the Battle of Oland (1564) between Swedish and Danish-Dutch allied forces confirmed the use of handheld weaponry including grenades (Glete, 2002). Accordingly, the naval warfare strategy was transferred from boarding techniques to heavy ordnance fire by the 17<sup>th</sup> century. Therefore, ships were constructed from high castles to bear the backfire and weight of the guns ensuring stability and their protection. The requirement of transferring a large number of men onboard caused to design of much larger ships.

## **Change of Propulsion Systems**

As per Parker (1998) approximately 160,000 men have engaged in the Battle of Lepanto in the year 1571 between the fleet of Holy League (coalition of Catholic Spain and Italy) and Ottoman Empire in the Gulf of Patras using 400 ships which each carried 400 men (Parker, 1998). This battle is again significant whereas this was the last recorded major battle that navies fought entirely using rowing vessels. These galleys and galleasses used human effort and favourable winds and used since ancient Mediterranean civilization including Greeks and Romans.

Heavy battle damages to the own men and assets in hand-to-hand combat and boarding tactics used in naval warfare psychologically affected on recruitment of men and their fighting capabilities. This has caused concern on

distance fighting at sea. Steam-powered ships and explosive shells have entered the battlefield in the early 19<sup>th</sup> century aftermath of the Napoleonic wars. By this time, ramming technology was faded away and German Light Cruiser SMS Emden was the last known warship deployed with a ram (Olson, 2018).

### **Late Modern Era**

The 20<sup>th</sup> century was a decisive era in naval warfare. Western colonial power together with the USA began to confront Germany and their allies at the beginning of the 20<sup>th</sup> century. Hence, naval confrontations predominantly became a decisive factor whereas offensive and defensive naval warfighting tactics were mainly hinged on the technology used by individuals.

Due to the excessive use of explosives, wooden hulls were replaced with steel armour. Steam propulsion systems were continued with more powerful engines to carry not only the men and weaponry but also onboard aircraft to engage three-dimensional warfare. During World War I, the quicker and larger guns onboard dreadnought battleships were encountered by better optical equipment, range finding technologies of the German Navy (Fobes, 2013). The introduction of turbines, torpedo boats, U boat technology, replacement of coal with oil, naval mines, radio, sonar and development of naval aviation technology were significant during this period. The Battle of Heligoland Bight (in 1914 and 1917), Dogger Bank (in 1915) and Jutland (in 1916), fought between British Royal Navy Grand Fleet with the Imperial German Navy's High Sea Fleet were a pivotal naval battle in World War I (Fobes, 2013).

Naval power became the most prominent arm in World War II. All kinds of operations in the books were employed during this period including joint operations, combined operations, psychological operations, electronic and information warfare and deceptions. The use of technology in Command and Control (C2), Communication, Intelligence, Surveillance and Reconnaissance (ISR), Electronic Warfare, Operation Security (OPSEC), and all other fields enhance the complexity of naval warfare in WW II.

The Battle of Toronto, Coral Sea, Midway, Eastern Solomon, Santa Cruz Island were notable in World War II. The Battle of Guadalcanal was recorded as one of the largest Amphibious Operations conducted by the Allied Pacific fleet against the Japanese Empire (Lundgren, 2020). By this time Battleships, Destroyers, Frigates, Corvettes and Carriers equipped with torpedoes, guided and cruise missiles and many other sophisticated weapon systems, sensors and enemy counterattack techniques were developed. During WW II other than naval aviation, the submarines were developed drastically with nuclear-powered propulsion systems.

World War II was concluded by the total annihilation of the naval power of the Allies. Sooner, US naval power dominated the sea all over the world. Notable developments were taken place aftermath of WW II and during the



cold war era including Korean War and Vietnam War are related to naval warfare. The Indo-Pakistan Naval War in 1971, Iraq War, Afghanistan War and Falklands War in 1982 are important sea confrontations in the 20<sup>th</sup> century.

The conflict in Sri Lanka reveals the use of asymmetric threat in maritime domain by the well-established sea wing of LTTE terrorist organization and countering it by successful sea confrontations at littoral and international waters by Sri Lanka Navy. The impacts of defeating LTTE at sea to terminate the 30 years-long conflicts in Sri Lanka and the level of integration of available technology with indigenous developments are worthy lessons to be learned by scholars.

### **Emerging Trends and Prospects**

From the ancient time to the 21<sup>st</sup> century, most of the navies were engaged in conventional naval warfare at sea. However, the emerging threats are moreover asymmetric and their requisites are beyond conventional war-fighting. That was mainly due to the inequality or incapability of rivals.

### **Reach Beyond Three Dimension**

The capability of operating in three dimensions (Sea, land and air) was an important aspect of the navy. However, most of the countries have already engaged with the fourth dimension, the cyber domain which is considered an essential and unavoidable aspect mostly related to threats in asymmetric nature. An individual can harm a powerful navy through a cyber-domain and paralyze their systems. Hence, this has become a much-needed area to be concerned even by smaller navies.

After a decade that US Navy SEALs completed their mission of killing Osama Bin Laden, have understood the necessity of shifting their naval troops' focus from counterterrorism to global threats. This is to be done by reducing their troops while enhancing their skills with modern sophisticated technological aids. Accordingly, they have explained their plan to return to the sea from the desert considering the global threat perception (Bolder, 2021). This emphasized the necessity of the use of technology for a Navy while changing their assigned mission as per the requirement emerged.

### **Countering Asymmetric Threats**

The extensive use of the maritime domain for illegal activities has become a burden to all legitimate navies in the world. Illegal drug trafficking, human trafficking and weapon smuggling have threatened the national security of countries all over the world. Incapability to control such illegal activities may invite foreign powerful navies to interfere in security matters of sovereign countries. Such interference of one foreign nation to a sovereign state located in a pivotal place where geopolitically important may cause to irrupt power game within powerful nations. Hence, despite having

less possibility to engage with full-scale conventional war with legitimate navy or terror groups, it is essential to maintain a strong navy with sophisticated technological aids to detect, identify and nullify asymmetric threats.

### **Naval Role in Disaster Management**

Other than the illegal activities, navies are frequently engaged in the disaster management process during natural calamities and manmade disasters. Modern equipment with advanced technologies is essentially required to enhance the efficiency and effectiveness during all the steps in the disaster management process. Inability to control such within oneself may again allow foreign interferences. The series of incidents that occurred aftermath of MT New Diamond and X-Press Pearl caught fire in Sri Lankan waters taught a good lesson to the Sri Lanka Navy and all other maritime organizations. Other than the cooperation among the relevant organizations, the necessity of a high level of readiness and possession of essential technologies to handle such situations were highlighted during these incidents.

### **Managing External Influences**

National security is of utmost importance and cannot be compromised by any sovereign state. Equip the Navy with modern weaponry and with available cutting-edge technologies to engage with threats in conventional and asymmetric nature would be a better option to ensure the national security of a country being the first line of defence. Inability to fulfil that may endanger the security of the state and the territorial integrity while inviting unnecessary interferences of foreign nations.

### **Human Resource and Automation**

Management of manpower is another important aspect of future naval warfare. Automated Systems and Artificial Intelligence have replaced the physical presence of men in engine rooms, diesel alternator rooms and many other compartments. These replacements reduce the cost incurred on human resources. However, capital expenditures to introduce such advanced automated systems may be considerably high and difficult to bear up by small economies. However, due to the success of the indigenous system design and development process in SLN during the recent past with locally manufactured fire alarm systems, main engine and propulsion control systems for FACs, more concern over research and development would ease up the financial constraints. The establishment of comprehensive surveillance and remote sensing mechanism to identify the threat that comes from the air, surface and sub-surface through Anti Air Warfare, Anti Surface Warfare and Anti-Submarine Warfare mechanisms are important in this process.



## **Information Warfare**

Surveillance and Reconnaissance mechanism. To ensure the special capabilities which surface ships should have such as survivability, mobility, fire-power and connectivity, acquiring and maintenance of equipment and sensors with modern cutting edge technologies are important (Freidman, 1999). For an example, a satellite communication facility available onboard a ship will ensure limitless connectivity while she is at a distance. Further, information warfare is connected or assisted to the success of many other security aspects.

## **Managing the Space Domain**

The world has moved to the space tourism era with vibrant competition between the SpaceX team and the Virgin Galactic team. Accordingly, space has become another important domain to which future militaries including the Navy must concern. The US Navy very recently announced the establishment of the Maritime Space Officer designator to streamline the joint warfighting effort and to ensure proper integration of technical knowledge and tactical acumen in the full range of joint space capability (US Space Command Public Affairs Office, 2021).

Many countries with small economies may not be able to engage fully actively in this domain. However, awareness and alertness through cooperation and collaborations with powerful nations may seek possible solutions for the time being. Being a maritime nation responsible for considerably large Exclusive Economic Zone, Pollution Prevention Zone, Maritime Search and Rescue Region and Flight Information Region, Sri Lanka Navy must concern to gain at least technical knowhow on space domain and its activities in this juncture.

## **Conclusion and Recommendations**

Naval warfare has evolved since its beginning and keeps on changing the dimensions and formations as per the internal and external environments. The development of technology had a significant impact on shaping up naval warfare throughout history. Ships designs, weaponry, counterattack techniques including active and passive detection systems were developed during these eras. The evolution of naval warfare and technologies can be described systematically by categorizing them as per the geographical zones or time. The acquaintance of the technological evolution process and its impact on naval warfare may assist to understand the gradual development of ships, their equipment and counter mechanisms throughout history. More than all, such understanding may assist to forecast the nature of naval warfare in the future.

Emerging trends magnified with the assistance of cutting edge technologies in surface, subsurface, air, cyber and space domains are equally important to evaluate with due concern on possible conventional and asymmetric threats. To meet these newer threats and influences, it is essential to associate with available new technologies by the Navy to a greater extent. However, financial

constraints and knowledge gaps which are inherent issues with small states are the main bottlenecks to acquire such high-end technologies.

Other than the acquisition of technology to the Navy, productive cooperation with local institutions and foreign navies would immensely assist to fill the technology gap. However, in the contemporary world, the safeguarding of sovereignty and territorial integrity has become a challenge to small states. Hence, such integrations have to be done vigilantly with extra care.

Being a comparatively small with the assets yet well-established victorious Navy in her maritime domain in the recent past, Sri Lanka Navy also has a good opportunity to excel the capabilities through her experience and with due concern on emerging trends in technology. Proper analysis of own capabilities, limitations, and sensible use of opportunities while countering threats is the best way to achieve that aim in the future for Sri Lanka Navy and any legitimate Navy of this nature.

## REFERENCES

Beckman, G., 2010. Hittite Chronology. *Akkadica*, Volume 119-20.

Bolder, L. C., 2021. Navy Times. [Online] Available at: <https://www.navytimes.com/news/your-navy/2021/04/28/navy-seals-to-shift-from-counterterrorism-to-global-threats/> [Accessed 2 May 2021].

Cassim, A. M., 2018. Exploring Sri Lanka's maritime history and heritage, s.l.: Daily FT.

Drews, R., 2020. The End of the Bronze Age: Changes in Warfare and the Catastrophe ca. 1200 B.C. Third ed. s.l.: Princeton University Press.

Edition, 7. A. ed., 2017. Battle of Guadalcanal.

Fobes, A. R. ed., 2013. The War at Sea: 1914-18. Canberra, National Library of Australia.

Freidman, N., 1999. New Technology and Medium Navies. [Online] Available at: <https://fas.org/man/dod-101/sys/ship/docs/working1.htm> [Accessed 30 April 2021].

Friel, I., 1995. The Good Ship: Ships, Shipbuilding and Technology in England, 1200-1520. s.l.: John Hopkins University Press.

Geisler, S., 2015. God and Sea Power: The Influence of Religion on Alfred Thayer Mahan. 1 ed. s.l.: Annapolis Naval Institute Press.

Glete, J., 2002. War and the state in Early Modern Europe: Spain, the Dutch Republic and Sweden as Fiscal-Military State. London: Taylor and Francis. Hao, Z., 2011. Illustrated ed ed. Hong Kong: Hong Kong University Press.

- Konstam, A., 2002. *The History of Shipwrecks*. New York: Lyons Press .
- Lange, C. H., 2011. The Battle of Actium: A Recommendation. *The Classical Quarterly* , 61(2), pp. 608-623.
- Lautenschlager, K., 1984. Technology and the evolution of Naval Warfare. *International Security* , 8(3).
- Lundgren, R., 2020 . *The Naval Battle of Guadalcanal*. s.l.:s.n.
- Naval History and Heritage Command, 2019. *Naval History and Heritage Command*. [Online]  
Available at: <https://www.history.navy.mil/browse-by-topic/communities/surface/sail.html>  
[Accessed 27 April 2021].
- Olson, W., 2018. *The Last Cruise of a German Raider: The Destruction of the SMS Emden*. Illustrated Edition ed. s.l.:Naval Institute Press .
- Parker, G., 1998. *The Military Revolution*. 2 ed. s.l.:s.n.
- Ratnatunga, R., n.d. *Dutta Gamini to Kassapa of Sigiriya: Third Century BC - Sixth Century AD*. In: s.l.:lakdiva Books .
- Thucydides, 1893. *The History of the Peloponnesian War*. New York: George Bell & Sons.
- USSpace Command Public Affairs Office, 2021. *USSpace Command*. [Online] Available at: <https://www.spacecom.mil/News/Article-Display/Article/2783251/navy-establishes-maritime-space-officer-designator-for-joint-warfighting-effort/> [Accessed 23 September 2021].
- Vego, M., 2009. *Naval classical thinkers and operational art*, s.l.: The United State Navl War College: Joint Military Department .
- Warming, R., 2019. An Introduction to Hand-to-Hand Combat at Sea: General Characteristics and Shipborne Technologies from c. 1210 BCE to 1600 CE. In: J. Ronnby, ed. *On wae on board: Archaeological and Historical Perspectives on Early Modern Maritime Violence and Warfare*. Stockholm: Sodertorns Hogskola, pp. 73-99.
- Wei, Y., 2014. Maritime Asia Admiral Zheng He's Voyages to the "West Oceans". In: *Education About Asia*. s.l.:Associaiton of Asian Studies, pp. 26-30.
- Wilkin, S., 2020. *Arab Islam War on Byzantium*. [Online] Available at: [https://www.researchgate.net/publication/344750489\\_Arab\\_Islam\\_War\\_on\\_Byzantium/citations](https://www.researchgate.net/publication/344750489_Arab_Islam_War_on_Byzantium/citations) [Accessed 02 May 2021].

# ROLE OF SRI LANKA NAVY IN FIGHTING PIRACY AND MARITIME TERRORISM



Lieutenant Commander (ASW) Asanka Sanjeewa

## Abstract

*Piracy and maritime terrorism have become an imminent threat to the Indian Ocean Region (IOR) which hinders the peaceful development in the regional countries. Being the centre of the Indian Ocean, Sri Lanka has a greater responsibility to have significant control over maritime security. Any disruption in the area would devastate trade and heavily impact on politics, security, and economy of the world. This paper assumes the disruption caused by piracy and maritime terrorism in the IOR and discusses the roles of the Sri Lanka Navy (SLN) in fighting against piracy and maritime terrorism. In the present scenario, conducting effective Maritime Domain Awareness (MDA) and ensuring the freedom of Sea Lines of Communication (SLOCs) are the vital role of SLN. Discussing opportunities, capabilities and intend of SLN are important to make guidance to upgrade the capabilities on a macro scale to counter piracy and maritime terrorism.*

**Keywords:** Piracy and Maritime Terrorism, Maritime Domain Awareness, Sea Lines of Communication, Indian Ocean Region, Maritime Security

## Introduction

Oceans are the lifeblood of the interconnected global community. Ninety percent of trade is done by volume travels across the oceans since it is the safest, cheapest, effective and economically popular means of transportation in the world (United Nations Conference on Trade and Development, 2018).

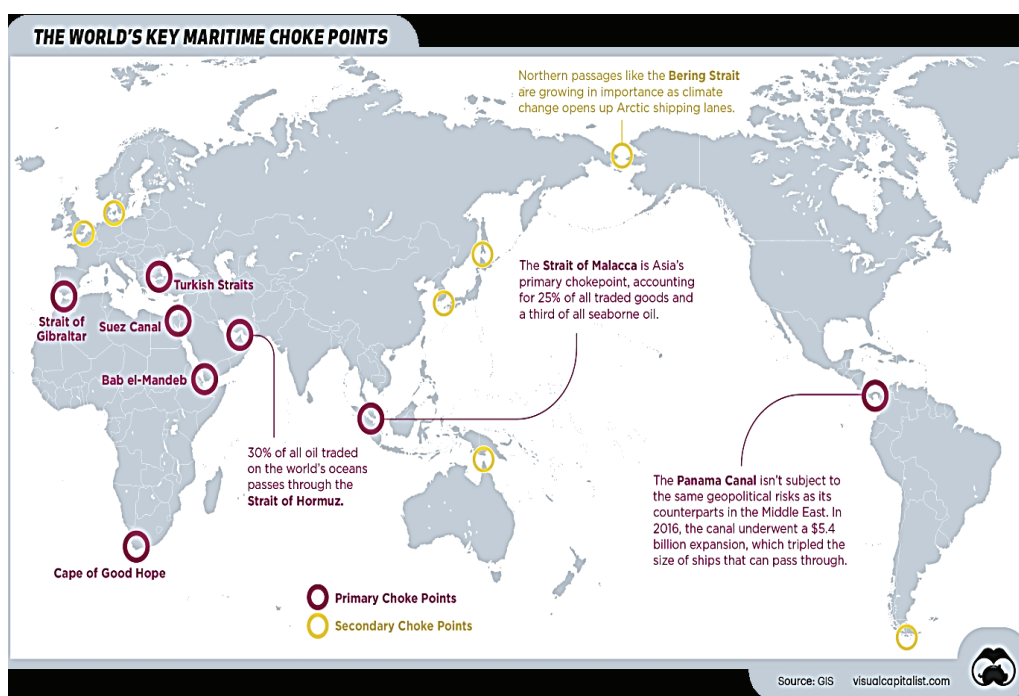
The big volumes of world trade and oil are transiting through the Straits of Malacca and Singapore. Major economies such as the United States, China, Japan, and India have ensured the safe passage of shipping through the region. Any interruption in shipping would heavily impact on their economies by disrupting port operations and the smooth flow of raw materials and finished products (Gilmartin, 2008).

The geographical location of the Indian Ocean Region (IOR) is a major factor influencing maritime terrorism and piracy. Narrow channels which slow down traffic, thousands of Islands that provide shelter and thousands of miles of coastline are the advantages of pirates, and terrorists during the attacks. Maritime terrorism can be defined as only one operation of terrorist organizations. Both maritime terrorism and piracy are having different objectives with limited

Cooperation between these groups is doubtful and both are dangerous specially in vulnerable areas such as the coast of Somalia, the Red Sea and the Gulf of Aden (Wikipedia Contributors ,2020).

## Strategic Importance of the Indian Ocean Region (IOR)

The Indian Ocean is the third largest sea in the world which covers twenty percent of the Earth (Anon, 2019). The other sea areas of the world are joined the IOR as major chokepoints via Suez Canal, Bab-El-Mandeb, Mozambique Canal, Cape of Good Hope, Ombai and Wetar Straits, Strait of Hormuz, Strait of Malacca and Singapore, Lombok and Sunda Straits. The IOR is encompassed with the seas mainly in the Gulf of Aiden, Arabian Sea, Andaman Sea, Bay of Bengal, Great Australian Bight, Gulf of Mannar, Laccadive Sea, Gulf of Oman, Mozambique Canal, Persian Gulf and the Red Sea. Therefore, any disruption to the Sea Lines of Communication (SLOC) in this region can directly affect the economy of the entire world (Villar and Hamilton, 2017).



**Figure 1 : The world's key maritime chokepoints**

Source: Editorial Team of Safety 4 sea, 2021

## Security Challenges in the IOR

All countries in the region are responsible to establish security in every aspect to maintain the smooth functioning of the Sea Lines of Communication (SLOCs). Following are the security challenges in the IOR.

- Maritime Terrorism.
- Maritime Piracy.
- Drug Trafficking and Arms Smuggling.
- Human Trafficking.
- Illegal ,Unreported and Unregulated Fishing (IUU).
- Illegal Exploitation of Marine Resources.
- Maritime Pollution (Oil spill risk).
- Disruption of Sea Lines of Communication (SLOCs).

### Maritime Terrorism

As per the definition given by the Council for Security Cooperation in the Asia Pacific (CSCAP), maritime terrorism can be defined as the undertaking of terrorist acts and activities within the maritime environment using or against vessels or fixed platforms at sea or in port, or against any one of their passengers or personnel, against coastal facilities or settlements, including tourist resorts, port areas and port towns or cities ( Yau and Wee, 2010).

Six types of possible terrorist attacks can be described in the maritime sphere.

- a. **Ship as a Barrier.** Hijacking and sinking a large vessel in the Strait of Hormuz or Malacca Strait, thus blocking /disturbing all traffic.
- b. **Ship as a Weapon.** Detonation of high-risk load such as liquified natural gas carrier in harbours.
- c. **Sea Mining.** Mining would be an effective strategy for terrorists to close narrow straits.
- d. **Small Boat Attack.** Ramming of high explosive suicide craft on a larger vessel can be used to block the shipping lanes and harbours.

e. **Sea to Shore Covert Attacks.** The terrorists may attack to a port or any other shore- based target by disguising as a merchant or fishing vessel from the sea.

f. **Use of One or More Containers to Transfer/Detonate a Weapon.** Even with the presence of the International ships and port Facility Security (ISPS) code there is still a possibility of attempting such an attack or transfer of a weapon load.

The Following are the organizations which have been identified as the maritime terrorist groups in the world (Nincic, 2012).

- Al-Qaeda.
- Abu Nidal Organization.
- Abu Sayyaf Group.
- Basque Fatherland and Liberty.
- Hamas.
- Hizbollah.
- Jemaah Islamiya.
- Lashkar e-Tayyiba.
- Liberation Tigers of Tamil Eelam (currently defunct).
- Palestine Liberation Front – Abu Abbas Faction.

## **Maritime Piracy**

Piracy is an act of robbery or criminal violence by ship or boat- borne attackers upon another ship or coastal area typically to steal cargo and other valuable items or properties. Those who engage in acts of piracy are called pirates (Wikipedia Contributors, 2019).

There are five main types of piracy currently occurring in waters around the globe.

a. **Thefts and Attacks on Vessels at Anchor or Pier Side.** The common type of attack is low-level armed robbery that occurs while ships are docked or moored. Pirates normally armed with small arms or knives approach via small, high- speed boats, seeking cash or other high-value personal items loots valuable items or properties.



b. **Robbery of Vessels at Sea.** Piracy at sea typically involves in more violence because crews are detained while the attackers ransack the vessel. These types of attackers are usually well-armed and well-organized.

c. **Hijacking of Vessels.** Most hijacked vessels are converted for illegal trade. The hijacked vessel's cargo is offloaded and sold or used by the pirates themselves. The vessel is then falsely re-registered and issued fraudulent documents, enabling the load of new cargo which in turn is usually sold on the black market. This type of phantom ship operation is typically perpetrated by highly trained and heavily armed pirate groups.

d. **Yacht Piracy.** Yacht hijacking is an attack against a private vessel targeting cash and marketable merchandise. This type of piracy is most common in the Caribbean seas where numerous private and well-stocked yachts sail for instance.

e. **Kidnap for Ransom.** Pirates board on a vessel for robbery,SS but also kidnap senior crew members. Later, the ransom is demanded from ship owners in exchange for the safe return of the crew members. This type of piracy is normally conducted by well-organized groups such as pirate gangs, criminal syndicates or terrorist groups.

The Piracy out at sea has become a considerable impediment to the maritime trade of the world. In 2020, International Maritime Bureau's (IMB) Piracy Reporting Centre (PRC) received 195 incidents of piracy and armed robbery against ships worldwide in comparison to 162 in 2019. The incidents included three hijacked vessels, 11 vessels fired upon, 20 attempted attacks and 161 vessels boarded. The rise is attributed to an increase of piracy and armed robbery reported within the Gulf of Guinea as well as increased armed robbery activity in the Singapore Straits and received zero incidents of piracy and armed robbery in 2020 for Somalia. While there were no recorded incidents, the IMB PRC warns that Somali pirates continue to possess the capacity to carry out attacks in the Somali basin and wider Indian Ocean(Commercial Crime Services,2021).

## Maritime Security Countermeasures

With the eradication of one of the world's menacing terrorist groups which is called the Liberation Tigers of Tamil Eelam (LTTE), Sri Lanka Navy was able to show its outstanding capabilities and professionalism to the world. The floating warehouse ships which were belonging to the LTTE were destroyed by Sri Lanka Navy and it was the turning point of the Humanitarian war. Thereafter, Sri Lanka Navy became the most experienced Navy in the region to fight against the terrorist. Each attack of LTTE was successfully encountered by Sri Lanka Navy by using their fleet. The Navy always adheres to the proper Rules of Engagement (ROE),



United Nations Convention on Law of the Sea (UNCLOS) and International Ships and Port Facility Security code (ISPS) during the humanitarian operations.

### **Maritime Intelligence**

The success of any military operation is based on a reliable intelligence source. Therefore, it is required to establish effective procedures to gather intelligence in the IOR more effectively than the present. Maritime terrorism and piracy may take different modes when they are operating. The intelligence has to be capable enough to find any form of activities timely without prejudicing maritime security in the region. The intelligence units can be operated as fishermen in Merchant Vessels (MVs) or through the information received from a reliable third party. In addition to that, the gathered information can be shared among the regional navies rather than waiting for personal achievements.

### **Threat Recognition**

Correct targets or units are required to identify well in advance for better planning of an operation. The form of incoming threat has to be recognized correctly to have a proper and effective engagement as per the internationally accepted rules. A large number of ships can be detected out at sea engaging in innocent passages, but few of them may undergo irregular or suspicious movements. The advanced technologies can be used to distinguish about the vessels, their identity and their voyage. But it is difficult to correctly identify the small boats and their nature of operation and manoeuvring.

### **Maritime Surveillance**

Continuation and thorough surveillance will give better detection, identification, monitoring and control of the territorial sea, economic zone and other important areas. Surveillance can be done through surface ships, submarines or Maritime Patrol Aircraft. The surveillance equipment can be used in passive or active modes. Radars, satellite and optical devices are the best-suited equipment for effective surveillance. The Sri Lanka Navy must possess sophisticated technology to carry out better surveillance in the region to overcome the threat of maritime terrorism and piracy.

### **Providing Security**

Due to the geographic location of Sri Lanka in the Indian Ocean, Sri Lanka should provide an effective security to all the ships which are transiting from West to East and East to West in the world, closer to Sri Lankan territory, especially ships which are passing through the Southern part of the country. The Sri Lanka Navy being the authorized body to establish continuous Sea Lines of Communication must ensure the safety of all other ships during their passage

to convince them, that they are free from any form of terrorist attacks or acts of piracy when they are in the IOR.

Further, it is required to increase the number of patrol vessels of the Sri Lanka Navy around the country along the most congested sea routes to strengthen the security of sea lines. Armed security sentries and escort ships can also be provided when the merchant vessels are moving alone in the most vulnerable areas.

### **Coordination with Other Regional Navies**

The Indian Ocean is considered as the third largest ocean in the world. No littoral state in IOR is capable to ensure the safety of the region alone. Therefore, it is required to establish diplomatic relationships among states within the region to uplift the standard and effectiveness of the security of the region to counter maritime security challenges. Sharing of real-time intelligence and available technologies among the states will help to identify the hotspots and vulnerable areas to maritime terrorism and piracy. The Indian Ocean Rim Association for Regional Co-operation (IOR-ARC) also concerns about the maritime safety and security as a priority area. Because all the states have identified the importance of the collaborated effort towards the maritime domain. In addition to this, all other regional organizations are also much concerned about maritime security in the region since it determines the future of the IOR and the entire economy of the world.

## **CAPABILITIES OF THE SRI LANKA NAVY**

### **Offshore Surveillance Squadron**

The needs of offshore control are radically different from those of land-based policing. This may not be as simple as it sounds. The agencies and authorities involved in offshore activities would be undertaken to assess the facilities already available such as means of command and control, surveillance, communications and data handling.

### **Fast Attack Craft Squadron**

In the recent past, Fast Attack Craft (FAC) were mainly responsible for most of the enemy craft destruction and they will remain as the vanguard of the Navy. History shows us naval battles are hard-fought and destructive, but high morale and courage in combat always depend on superior machines. Therefore, SLN should possess well fitted FAC Squadron for outwitting or outfighting an unequalled enemy.

## **Auxiliary Squadron**

Although Sri Lanka has an extensive road network, sea transportation remain the cheapest means of transportation of cargo for various destinations. The amphibious capabilities of the Sri Lanka Navy will remain an important element of the fleet when transporting troops and equipment. Further, this squadron plays a vital role in providing fuel, water and other to units to boost up their endurance.

## **Inshore Patrol Craft Squadron**

Owing to continuous harbour security and inshore patrol requirements, demands for Inshore Patrol Craft (IPC) will remain unchanged. Recently Sri Lanka Navy has started a new project to build IPCs locally. The local builders should be encouraged to build IPCs with lesser length to achieve high speed. The weapons outfit for the IPCs need to be reviewed considering the threat perception of the enemy.

## **Concepts of Asymmetric Tactics**

The humanitarian war in Sri Lanka encompassed all aspects of asymmetric warfare. In the case of the LTTE, initially, they were much smaller and weaker against the formidable force levels of Sri Lankan armed forces. The LTTE always had a grand objective that is to achieve a separate state for Tamils and they did everything possible for attaining it. The LTTE Sea Tigers posed a serious threat to the SLN's dominance at sea or in harbour and they were able to use the oceans for their advantage whenever they needed to do so. They engaged in asymmetric tactics such as suicide boats, suicide underwater saboteurs, swarming tactics, underwater limpet mines and submersibles against the much superior Sri Lanka Navy and threatened the very survival of it. At the end, Sri Lanka Navy was able to show its outstanding capabilities of asymmetric warfare to the world.

## **Discussion**

### **Possible Improvement to Upgrade the Capacity of SLN**

Following are recommended to upgrade the capacity of the Sri Lanka Navy.

- Deploy Sri Lanka Navy fleet to carry out various tasks within Exclusive Economic Zone (EEZ) with more endurance and capabilities.
- Manipulate Sri Lanka Coast Guard (SLCG) to safeguard the coastal area of Sri Lanka.
- Standardize the weapon outfits and sensors of Sri Lanka Navy fighting ships and craft with enhanced ranges and Fire Control Systems.

- Uplift maritime surveillance capability in liaison with the Sri Lanka AirForce.
- Develop a combined operating picture using network-centric operations.
- Improve intelligence gathering mechanism by obtaining assistance from foreign countries and satellites along with other high-tech sensors.
- Modify training methods and contents based on lessons learned and to be in balance with the latest development in science and technology.
- Well-organized Naval Doctrine to be published.
- Acquire additional Offshore Patrol Vessels (OPVs) and Frigates to strengthen the security of EEZ.
- All the vessels including Fast Attack Craft (FAC) to be fitted with Advanced Maritime Surveillance capabilities with Automatic Identification Systems (AIS).
- Shore bases around the island have to be equipped with advanced surveillance capabilities with facilities to direct a vessel towards a suspicious location within a short period and keep connecting with other navies who are having strong surveillance capabilities.
- Inaugurate a Maritime Air Wing and acquiring Maritime Patrol Air Craft and Helicopters.
- Establish fully equipped Visit Board Search and Seizure (VBSS) team on-board ships.
- Introduce anti-piracy weapons to the Sri Lanka Navy.
- Enhance capabilities of shore base security station with modern Radars, AIS, modern Communication Sets, high-powered Binoculars and infrared and colour Cameras.
- Request economic, diplomatic and military assistance from the US, China, Japan or other regional countries.
- SLN should build good inter-relationships between neighbouring countries by sharing information and resources, collaborative methods, joint exercises and training to secure the maritime environment in the region. s
- Acquire the facility of Indian Long Range Identification and Tracking(LRIT) data center to monitor and track merchant vessels.

- Organize conferences, seminars, webinars and symposiums to share knowledge and experience on maritime security among the nations.

## **Proposals to Mitigate the Maritime Threats**

Following proposals are brought forward to overcome piracy terrorism threats;

- Existing regulations and laws should be improved according to the International legal framework by granting more powers to the SLN and the SLCG and raise legal awareness of national agencies and local authorities.
- Empower tripartite maritime security pact (Sri Lanka, India and Maldives) to uplift the join cooperation on Exclusive Economic Zone (EEZ) on surveillance, Search and Rescue (SAR) operations and working on anti-piracy efforts and sharing and tracking of merchant vessels using new technologies.
- Carry out joint naval anti-piracy operations in the IOR and host maritime security exercises among the neighboring countries.
- Build up cooperative regional approach between states by joining regional, sub-regional and multinational cooperation (Southern African Development Community (SADC), The South Asian Association for Regional Cooperation (SAARC), The Association of South-East Asian Nations (ASEAN), The ASEAN Regional Forum (ARF), The Five Power Defence Arrangements (FPDA), Indian Ocean Commission (COI), The Indian Ocean Rim Association for Regional Co-operation (IOR-ARC), The Gulf Cooperation Council (GCC), etc..
- Provide defence aid to Mauritius, Seychelles and Maldives to build capacity to address non-traditional security threats such as Maritime terrorism and piracy.
- Utilize Sri Lanka Navy Off-Shore Patrol Vessel (OPV) to escort Merchant Vessels (MVs) through the Internationally Recommended Transit Corridor (IRTC).
- Formulate suitable Standard Operating Procedures (SOPs) for coordinating Sri Lanka Navy's activities in the Gulf of Aden with the navies of friendly foreign countries.
- Coordinate exercise among the navies for sharing best practices and activities of nations involve in counter-piracy operations in the region.

- Establish Command Control Centers of SLN in Galle and Hambanthota which include assets and Special Forces designed to respond rapidly to hijackings and “hit and run” piracy.
- Install Radar and communication towers along the South and East coast of Sri Lanka. The system will facilitate tracking and reporting of pirate and terrorist activity.
- Offer escort services to high-risk commercial vessels entering from the Sri Lankan waters.
- Streamline the Maritime Enforcement Coordination Center (MECC) by authorizing the MECC to coordinate all enforcement activities of the SLN, AirForce, Coast Guard, Fisheries Department and Customs and Excise Department. The MECC coordination effort will benefit from the use of new satellite monitoring and communications technology.
- Integrate a surveillance and information network for tracking and investigating suspicious activity for each boat.
- Improve the Navy and Coast Guard patrols and institute random escort of high-value merchant vessels.
- Strengthen detachment’s mission in major sea routes and assist with ship surveillance in the area currently being performed by land Radar seeking assistance and training to improve the quality of SLN.
- Sustain a strong intelligence network. Despite efforts to strengthen the National Intelligence Coordinating Agency, military authorities cite none sharing of intelligence as hampering the anti-terrorism campaign.
- Initiate Maritime Domain Awareness (MDA) training and step in information sharing and training to scrutinize reported incidents and share relevant information with responsible organizations in the region.
- Provision of SLOCs security. Supply chain dynamics are the key to maritime security issues and include ships, ports and choke points.
- Ameliorate defences and development of ports.
- Develop a tactical picture around our country combining all sensors such as ships, aircraft, satellites, fishing vessels, merchant ships and shore-based radar stations.
- Advanced container scanning system has to be established in every port for the functioning of ISPS code properly.

- To minimize insecure ingressions, increasing guards, security cameras and installation of radiation detectors and X-scanners with biometric access to critical port infrastructure are mandatory.
- Being a Designated Authority (DA) of GoSL, SLN should initiate action to review and update Port Facility Security Assessment (PFSA) of all major ports in Sri Lanka (Colombo, Hambantota, Galle and Trincomalee) to identify possible threats to the assets and infrastructures in order to establish and prioritize security measures to mitigate vulnerabilities.
- Most of the port facility providers have a lack of interest in security concern and they are reluctant to invest money for security aspect. Hence, SLN should strictly conduct audit/inspection quarterly on the port facility security arrangements and readiness of Port Facility Security Plan (PFSP) when awarding/verification of Statement of Compliance of a Port Facility (SCPF).
- Piracy and maritime terrorism will not fade until effective deterrents mainly prosecution and punishment are in place. Hence, international legal frame work should be rigid enough to eradicate this menace.

## Conclusion

The substantial role of the Sri Lanka Navy in abolishing the empowerment of Maritime terrorism and pirates' dictatorship is admirable in Sri Lanka. Furthermore, the continuity of potential of the Sri Lanka Navy is an important task. Exercising to uplift the capabilities will lead to ensure the stability of the country affiliated with oceanic affairs. Maritime intelligence, threat recognition, maritime surveillance, provision of security and coordination with other regional navies are available maritime security countermeasures of the Sri Lanka Navy. Further, these countermeasures are taken by the Sri Lanka Navy utilizing its capabilities of Off-Shore Surveillance Squadron, Fast Attack Craft Squadron, Auxiliary Squadron, Inshore Patrol Craft Squadron and Concepts of Asymmetric Tactics as well. A combination of real-time maritime intelligence, shore-based surveillance, strong maritime patrol and the prerequisite of sophisticated technology to carry out better surveillance within the Indian Ocean Region (IOR) is mandatory to unfold the security prevalence of the country.

Admitting the recommendations of this paper will diminish the risks of maritime terrorisms and piracy. The preventives associated with advanced technology will demonstrate the gradual predominance of SLN in declining terrorist and pirate powers. Punctual access to information will pave the path to destroy the roots of an unfavorable controversy. Updating the data combined with departures and reaching outs to naval routes will be beneficiary



to identify illegal entries to a predetermined sea area. The ISPS code is a set of measures to enhance the security of ships and port facilities, in the present scenario, the significant role of the ISPS code is also praiseworthy.

Moreover, the authentic contribution of the naval power of other countries to subjugate these menaces, piracy, and maritime terrorism is requisitioned in considerable proportions. Interrelated naval affairs and uninterrupted operations via sea will lead to improving the standard of individual navies that would uplift the political, economic and social stability of the country. A collaborative solution is needed for tackling maritime threats.

## REFERENCES

Anon (2019) Ocean Geography ~ MarineBio Conservation Society. Available at: <https://www.marinebio.org/oceans/geography/> (Accessed: 19 April 2021).

Commercial Crime Services, I. C. of C. (2021) 'Gulf of Guinea records highest ever number of crew kidnapped in 2020, according to IMB's annual piracy report', Icc-Ccs.Org, pp. 4–7. Available at: <https://www.icc-ccs.org/index.php/1301-gulf-of-guinea-records-highest-ever-number-of-crew-kidnapped-in-2020-according-to-imb-s-annual-piracy-report> (Accessed: 18 September 2021).

Editorial Team of Safety4sea (2021) Which are the world's most important maritime choke points - SAFETY4SEA, safety4sea. Available at: <https://safety4sea.com/which-are-the-worlds-most-important-maritime-choke-points/> (Accessed: 29 August 2021).

Gilmartin, H. (2008) 'The Malacca Straits as Catalyst for Multilateral Security Cooperation', *Sicherheit & Frieden*, 26(4), pp. 220–226. doi: 10.5771/0175-274x-2008-4-220.

Nincic, D. (2012) Maritime Terrorism: How Real is the Threat? - Fair Observer, Fair Observer. Available at: [https://www.fairobserver.com/region/north\\_america/maritime-terrorism-how-real-threat/](https://www.fairobserver.com/region/north_america/maritime-terrorism-how-real-threat/) (Accessed: 19 May 2021).

United Nations Conference on Trade and Development (2018) Review of Maritime Transport 2018 | UNCTAD, Review of Maritime Transport 2018. Available at: <https://unctad.org/webflyer/review-maritime-transport-2018> (Accessed: 29 October 2021).



Villar, L. and Hamilton, M. (2017) Three important oil trade chokepoints are located around the Arabian Peninsula - Today in Energy - U.S. Energy Information Administration (EIA), U.S Energy Informations Administration. Available at: <https://www.eia.gov/todayinenergy/detail.php?id=32352>.

Wikipedia Condributors (2019) Piracy - Wikipedia, Wikipedia.com. Available at: <https://en.wikipedia.org/wiki/Piracy> (Accessed: 23 April 2021).

Wikipedia Condributors (2020) Counter piracy off the coast of Somalia, Wikipedia.com. Available at: [https://en.wikipedia.org/wiki/Piracy\\_off\\_the\\_coast\\_of\\_Somalia](https://en.wikipedia.org/wiki/Piracy_off_the_coast_of_Somalia) (Accessed: 29 October 2021).

Yau, J. and Wee, M. (2010) 'Maritime Terrorism Threat in Southeast', 43(2).

## SEA TURTLE PROJECT : WHAT WAS AND WHAT IS ?

Lieutenant Prageeth Sahan



### Abstract

*The focus of this research was on the sea turtle protection initiative, its evolution, and future suggestions. Despite the fact that there are various initiatives connected to the protection of sea turtles in different countries, this study is confined to the Sri Lankan environment in terms of the sea turtle project and conservation. Sea turtles have been present for almost 100 million years, yet their continued existence is in doubt in today's world. Human effects such as bycatch in fisheries, coastal development, plastic trash, and the consumption of sea turtles and their eggs have put six of the seven sea turtle populations on the edge of extinction. If sea turtles go extinct, marine life habitats may suffer in ways we do not even realize. Dune and beach habitats, as well as coral and ocean ecosystems, benefit from sea turtles and their eggs. It is anticipated to examine the current state of sea turtle conservation, uncover flaws, and provide more effective efforts and recommendations. The primary sources were obtained through the scholar's online articles, research papers, blogs and journal articles since the research study is driven in the qualitative method. Finally, the findings highlight the importance of continues conservation and monitoring effort to protect these globally conserved creatures.*

**keywords:** Sea turtle project, conservation, extinction, eco system

### Introduction

Sea turtles play a crucial role in the marine ecosystems. Seagrass, like grass lawns, has to be trimmed short. Sea turtles play an important role in preserving the marine ecosystem's sustainability, especially the health of grass beds and coral reefs. It benefits other high-demand aquatic animals (such as shrimp and tuna) because their habitat is now more conducive to growth and reproduction. Without stable seagrass beds, these animals' reproduction will be disrupted, and the entire food chain will suffer, ultimately allowing the availability of food supplies for humans to deteriorate. The nests of sea turtles provide nutrition to the beach and its vegetation (dune vegetation). Stronger dune vegetation helps the roots and plants to help hold the soil and avoid soil erosion, helping the landscape as a whole. These habitats are home to many species and foster environmental safety; without sea turtles, the ecosystems will be in grave danger. Sea turtles have a favorable impact both in and out of the sea. Nesting sea turtles add to the health of beaches by depositing their eggs in the sand. Eggshells and unhatched eggs left behind provide essential nutrients to dune plants

such as beach grasses, which help to stabilize dunes and deter coastal erosion (World Wildlife Fund, 2000).

Since all aspects of the world are interconnected, if one species' population is disturbed, the majority of the species, including humans, will suffer. As a result, sea turtle restoration should be promoted so that we do not miss a significant population in the environment. Turtles play important roles as scavengers, herbivores, and carnivores, and they often contribute a significant amount of nutrients to the ecosystem. They degrade the energy in plant materials and turn it to protein. Beaches have a very poor ecology and they do not have enough food supplies, so there is very little vegetation. When sea turtles' nests, they continue to sustain this habitat. The reason for this is that not all of the tens of thousands of eggs laid by turtles can hatch. Those that do not hatch will decompose and feed the beaches. With a dwindling turtle population, less eggs are laid, resulting in less vegetation, which causes beach erosion (Wilson et al.,2010).

## **Discussion**

The Indian Ocean is a popular location for sea turtles to live and breed, but the turtle population in popular coastal areas is struggling to deal with the impact of climate change and human population growth. Sea turtles are known as a national treasure in Sri Lanka. The five sea turtle species present in Sri Lankan waters, the Green, Leatherback, Olive Ridley, Loggerhead, and Hawksbill, all visit the island's Southern beaches. Sea turtles spend the rest of their lives in the ocean, but they come ashore to lay their eggs on occasion. In Sri Lanka, their local breeding areas extend from Mount Lavinia down the West coast, across the South coast, and up to Arugam Bay on the East coast. Female nesting green turtles, the most common species in Sri Lanka, are often killed for their meat, which is considered a delicacy in much of Asia (Jayathilaka,2017). It is an offense in Sri Lanka under the Fauna and Flora Protection Ordinance to catch, destroy, harm, or possess sea turtles or their eggs. The export trading in sea turtle goods has been prohibited in Sri Lanka by FFPO 1938 which was amended in 1972 (GoSL,1972).

Sri Lanka has been a signatory to the CITES (Convention on International Trade in Endangered Species) convention since 1979, which bans the import or sale of sea turtles and their products. Numerous wide-ranging conservation programmes have been initiated in order for turtles to survive in Sri Lanka.

The Turtle Conservation Project (TCP) was established in Sri Lanka in 1993 with the goal of developing and facilitating the adoption of long-term marine turtle conservation strategies through education, science, and community involvement. To accomplish its vision, the TCP conduct research, surveys, information and awareness campaigns, community-based conservation and management programmes, and community-based conservation and management programmes. To promote the continuity of the initiated operations, TCP maintains

field stations and offices in Rekawa, Tangalle, Panadura, Kandakkuliya, and Kosgoda (Turtle Conservation Project (TCP) of Sri Lanka, 2021).

Six of the seven sea turtle species are listed as vulnerable or endangered globally as a result of human activity, and five of them are present in the waters around Sri Lanka. Under the visionary concept of former Commander of the Sri Lanka Navy, Vice Admiral Piyal De Silva's 'Neela Haritha Sangramaya,' which is aimed to create a sustainable environment for future generations while leading and setting a precedent in protecting, conserving, and developing the green and blue environment throughout the country. In addition to this commendable effort, the Sri Lanka Navy has initiated a turtle conservation project in Galle Face beach area. As a result, over 7000 baby turtles have been successfully released into their natural habitat directly from the Navy's hatcheries. The Sri Lanka Navy is carrying out a turtle restoration Programme with the primary aim of conserving endangered sea turtles in order to better preserve the biodiversity of the marine environment.



**Figure 1 : Navy's passion for turtle conservation**

**Source : Sri Lanka Navy (2020)**

On 5<sup>th</sup> February 2020, a bale of sea turtle hatchlings appeared from the turtle conservation site at the Galle Face, ushering in a new chapter in the Sri Lanka Navy's turtle conservation Programme. The Navy protected this site after turtle eggs were discovered in the area. Several sea turtle eggs were discovered at the Galle Face beach as an eloquent testament to the effectiveness of beach cleaning programmes carried out as part of the 'Green and Blue' project initiative. Meanwhile, the Navy has been conducting turtle conservation initiatives in the Panama, Mirissa, and Wellawatta region, and naval staff participating in these projects ensure that the whole operation, from the conservation of sea turtle eggs to the release of turtle hatchlings into the ocean, is carried out properly. Meanwhile, the SLN, which has a significant number of productive staff, have been performing a number of conservation exercises along the island's coastal belt, persuaded that the conservation of marine resources is important. . Presently, to secure aquatic resources, the SLN conducts regular patrols. Furthermore, the Navy conducts daily patrols in the waters off the island and along the coastal belt, keeping a close eye out for illegal fishers. The Navy has saved and released to the sea a huge number of turtles captured by fishermen and stuck in madal fishing nets.



**Figure 2 : Navy's passion for turtle conservation pays rich dividends**

**Source : Sri Lanka Navy (2020)**

Orange turtles, leatherbacks, olive ridleys, hawksbills, and loggerheads are among the seven sea turtle species that nest on Sri Lankan beaches (Deraniyagala, 1953). Sea turtles use the South and Southeast coasts, which have large fields of sea grass beds and coral reefs, as valuable breeding and foraging sites (Deraniyagala, 1939; Amarasooriya, 2000). In 1994, the turtle Conservation Project (TCP) conducted a survey that found 112 shops publicly selling tortoiseshell items made from hawksbill shell in six towns in traditional tourist areas (Kapurusinghe, 2006). A second study, conducted in 1996, discovered 83 shops selling tortoiseshell in 14 cities (Richardson, 1997). However, according to a new poll, the majority of these stores no longer purchase tortoiseshell goods from retailers, despite the fact that a few stores do sell some of the previously stocked unsold stocks (Rajakaruna et al., 2013).

According to a research study done on Sea turtle conservation in Sri Lanka: assessment of knowledge, attitude and prevalence of consumptive use of turtle products among coastal communities, the research was carried out in six villages along Sri Lanka's North Western, Western, Southwestern, and Southern coasts to determine villagers' knowledge of sea turtles, attitudes toward sea turtle conservation, and the prevalence of consumptive use (Rajakaruna et al, 2009).

Six coastal villages in four districts of Sri Lanka, Kandakuliya, Mattakuliya, Wedikanda, Kahandamodara, Kosgoda, and Rekawa, were chosen based on nesting frequency and turtle bycatch data. Long-term turtle awareness programs are being carried out in and around these high nesting villages by nongovernmental organizations such as TCP in coordination with Sri Lanka's Department of Wildlife (DWL). TCP organizes turtle awareness in kandakuliya. Each village had one hundred randomly chosen villagers interviewed, and the data was gathered over a four-month period from May to August. they were mainly questioned in regarding the knowledge about sea turtles, attitude towards sea

turtle conservation and Prevalence of consumptive use of sea turtle eggs, meat and other products (Rajakaruna et al, 2009).

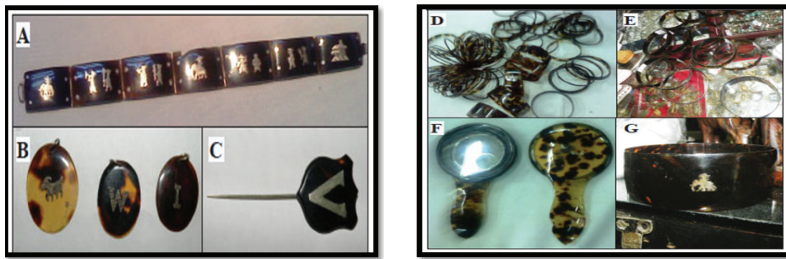
According to the interviewed survey (Rajakaruna et al, 2009), except in non-nesting areas, the majority of the villagers (more than 85 %) were well aware that only the female visits the beach to lay eggs at night. Although only a small percentage of respondents (27%) were aware that five species frequent Sri Lankan beaches. The majority of respondents (93%) were unaware that there is a nesting season and that a female may come ashore several times. On average, the majority of respondents (73 %) had a favourable outlook toward sea turtle survival, primarily that people had not sacrificed their sources of income as a result of the introduction of turtle conservation regulations. Overall, 22 percent of respondents in the six villages recorded high consumption, responding "yes" to two or more questions about feeding, purchasing, and selling turtle eggs, fruit, or other items. According to Shanker and Choudhury (2006), the economic question when attempting to cross the distance between intent and progress, the coastal environment is a critical topic to consider (Rajakaruna et al, 2009).

In the research study, sea turtle hatcheries in Sri Lanka: their activities and potential contribution to sea turtle conservation, Rajakaruna et al, (2013) depicted many nations, including the Southeastern coast of Sri Lanka, have sea turtle hatcheries as an ex-situ conservation mechanism (Shanker, 1994; Upm & Perhilitan, 1996; Chan, 2001; Shanker, 2003). The Wildlife and Environment Protection Society of Sri Lanka, a non-governmental organization dedicated to nature conservation, founded the first Sri Lankan sea turtle hatchery in 1956 at Yala National Park. In 1969, a second hatchery was built at Palatupana (Hewav- isenthi, 1993; Tisdell and Wilson, 2005). Both hatcheries were developed with the primary goal of conserving, restoring, and managing sea turtles and their ecosystems in Sri Lanka. However, there was considerable intervention in the life cycle of turtles born and bred in hatcheries, making their longevity in the wild very doubtful (Pilcher & Enderby, 2001). Turtles, like herbivorous adult green turtles, were fed with readily available fish at all Sri Lankan hatcheries. Any hatchery owners claimed to feed green tuatara a mixed diet of sea grass and fish (Rajakaruna et al, 2013).

In a study done on Tortoiseshell Trade in Sri Lanka, Tortoiseshell Trade in Sri Lanka: Is Centuries-old Trade Now History? (Rajakaruna et al, 2012). it depicted the fact that the tortoiseshell trade was prohibited by the CITES protection treaties in 1977 (Convention on International Trade in Endangered Species of Wild Fauna and Flora). The rate of trade started to decline when major exporting nations joined CITES. Sri Lanka joined the Convention on International Trade in Endangered Species (CITES) in 1979, banning the import or sale of sea turtles and their products. According to Curry and Mathew (1995), the bulk of



hawksbill scutes used in the tortoiseshell industry in Sri Lanka were smuggled in as dried fish consignments from the Maldives.



**Figure 3: Tortoiseshell Trade in Sri Lanka**

Source : Rajakaruna et al, (2012)

As a result, despite success in reducing the killing of local sea turtles for scutes in Sri Lanka, it is critical to investigate whether the shell trade is still active and important. However, with a significant rise in tourism after the end of the armed conflict, there may have been an increase in demand for tortoiseshell posts, so it was critical to examine whether tortoiseshell items were sold from secret stocks. As Witherington and Frazer (2003) point out, where an economically important ecological resource is subject to open access, environmental failures are unavoidable. Few retailers (14%) reported that some consumers, mostly international visitors, continue to request tortoiseshell items (Rajakaruna et al, 2012).



**Figure 4 : A sailor rescuing a juvenile green turtle from a shrimp net in the Gulf of Mannar, Northern Sri Lanka**

Source : Sri Lanka Navy (2019)

## Recommendations

Many different nations and communities must collaborate and share responsibilities in order to truly preserve sea turtles around the world. International treaties and arrangements, as well as study and the efforts of committed organizations and individuals, must all play a role. Long-term sea turtle conservation often entails designing strategies to minimize dependency on management practices that require direct human intervention, such as nest relocation or hatchling rearing in captivity sea turtles are doomed if they cannot live and

reproduce on their own without human assistance. Feeding and breeding areas must be protected, and a public wildlife management culture that can overcome loopholes in federal legislation, opposition from commercial interests, and changes in the political environment must be fostered. When it comes to the broader plan of SLN on turtle conservation, together with the national policy, it is expected to implement more turtle conservation projects around the country with the primary goal of preserving endangered sea turtles in order to help maintain the marine ecosystem's biodiversity. It has been also examined on the fact that, many of these sea turtles are being trapped on shrimp nets, bottom trawling and dynamite fishing. While entangled turtles may keep their heads above water to breathe, turtles stuck farther beneath are in grave danger of drowning. Even those that are rescued from the nets do not always emerge unscathed; many are injured by the nylon mesh of the fishing nets, sometimes severely enough to necessitate the amputation of their flippers. For this, turtle's excluder devices are recommended. Turtles and other bigger animals bump against the grid and escape through a gap in the mesh, while shrimp slide between its bars to the back of the net. Apart from that, it is necessary to introduce and enhance awareness and conservation programmes, as well as to improve enforcement of laws prohibiting consumptive usage along the coast, especially in villages in the Western and North Western regions where it is the most important areas for sea turtle protection. Hence, necessary actions and awareness programs must be implemented to protect these magical creatures.

## REFERENCES

Rajakaruna, Ekanayaka, Kapurusinghe and Ranawana (2009). Sea turtle conservation in Sri Lanka: assessment of knowledge, attitude and prevalence of consumptive use of turtle products among coastal communities. Iotn10-01

Rajakaruna, Ekanayaka, Kapurusinghe and Ranawana (2013). Sea turtle hatcheries in Sri Lanka: their activities and potential contribution to sea turtle conservation. Iotn13-

Rajakaruna, Ekanayaka, Kapurusinghe and Ranawana (2012), Tortoiseshell Trade in Sri Lanka: Is Centuries-old Trade Now History? Marine turtle newsletter, 134:9-1,

SLN Web unit (2019). Sri Lanka Navy - Home. [online] Navy.lk. Available at: <https://www.navy.lk/>. [Accessed 5 Apr. 2021]

World Wildlife Fund. (2000). Sea Turtle | Species | WWF. [online] Available at: <https://www.worldwildlife.org/species/sea-turtle>. [Accessed 5 Apr. 2021]



## FACTORS INFLUENCING GREEN HUMAN RESOURCE MANAGEMENT

Lieutenant (S) Maduranga Nanayakkara



### Abstract

*The study aims to find the factors influencing Green Human Resource Management. The study provides a better understanding of Green Human Resource Management (GHRM) by aiming on meaningfulness through HRM practices in organizations as a crucial factor. Green HRM has become a leading business strategy where the Human Resource Management department plays an active role for greening whole the organization. The research is conducted to find out what are the influencing factors on Green Human Resource Management and the objective of the study to identify the factors influencing Green Human Resource Management, is aligned with main research question. As an Empirical study, the findings of previous researches are discussed through this study and answering research question. The systematic literature is searched through different topics related to the GHRM from different journal articles. The theoretical review presents details regarding Environmental Accountancy Theory and Environmental Adaptation Theory. The word GHRM was defined by the several ways by different scholars in their studies. Green HRM is a strategy of Human resource management as Human Resource Management practices which aims on environmental sustainability by developing environmental sustainability oriented workforce and company background. According to the findings of previous studies, there are several factors influencing on Green HRM. There are government rules, regulations, commitment of management, employee engagement, organizational environment, organizational culture and green information system. And also there are GHRM indicators as green selective staffing, green training, green empowerment, green rewards, green career opportunities, green teamwork, green work life balance and green participation in decision making. The study provides recommendations based on these influencing factors of Green HRM. The study provides guidelines for organizational internal parties and external parties to reach sustainable development through Green Human Resource Management.*

**Keywords:** Green Human Resource Management, Human Resource Management Practices, Influencing factors of GHRM

## Introduction

Our Common Future, the report of the United Nations is a lighthouse for Green Human Resource Management (GHRM). The report is contributed to guide the vital role of Human Resource Management in strategically greening the organization (United Nations Environment Programme, 2019).

The climate change and environmental degradation change have become the most influencing problem in current century resulting in economic losses from climate and weather-related disasters like droughts, floods, wildfires, hurricanes etc. This programme discovered that approximately 1.8 Celsius of global warming before pre-industrial levels impacted by human activities (United Nations Environment Programme, 2019). The main reasons of ecological harms at local, regional and global scales are occurred and it has been at the center point for all sustainability discussions (Moscardo, et al., 2013).

Sustainability is defined as all business activities are focused to improve the ecological and social performance while reaching the financial bottom line (Brockhaus, et al., 2013).

Business operations are required and changes for achieving environmental sustainability. The important point is employees are the main change agents. The improvement of environmental performance and change in general processes mainly depend on employees (Nejati, et al., 2017). Green Human Resource Management (GHRM) plays a giant role in creating organizations more sustainable (Brockhaus, et al., 2013). The importance of GHRM is contributed to achieve environmental sustainability (Nejati, et al., 2017) (Dumont, et al., 2017) (Donohue & Torugsa, 2016) (Renwick, et al., 2016). The GHRM is named as the 'environmental' human resource management that is an important tool for implementing the organizational sustainable development strategy successfully (Renwick, D. W. S., Redman, T., & Maguire, S., 2013).

## Research Question

What are the factors influencing Green Human Resource Management?

## Research Objective

The main objective of this study is "To identify the factors influencing Green Human Resource Management".

## Methodology

This study is an Empirical study which uses secondary data from previous studies of scholars. This extant literature is going through topics relating to the Green HRM from different databases and journals. The systematic review of

collected literature was done in detail.

## **Literature Review**

The literature review is conducted for achieving research objective. The literature review consists of with main two sections as “Theoretical Framework” and “Empirical Review”. Theoretical framework presents the theoretical background for study and empirical review presents findings and details of previous studies.

### **Theoretical Review**

The theoretical framework for the study was started by mentioning definitions of GHRM, practices of GHRM and indicators of GHRM and secondly mentioning theories relating to GHRM.

### **Green Human Resource Management**

According to Renwick, et al. (2013), Green Human Resource Management is the HRM persuasion of environmental management. Yusoff, et al (2018) had defined Green Human Resource Management as human resource management practices that focuses on environment sustainability by creating green employees who have capability to influence on company’s environmental approach. GHRM adverts to the practices, policies and systems that create employees of the company green for the benefit of society, individual and natural environment and the company (Opatha & Arulrajah, 2014).

Additionally, to these, Green HRM is defined as a group of people oriented practices for improving and maintaining the organizational motivation, abilities and opportunities to organisation’s financial and economic sustainability (Martinez-del-Rio, et al., 2012 ; Renwick, et al., 2013).

## **OPERATIONAL DEFINITIONS FOR TERMS**

### **Green Human Resource Practices**

The Green HRM is able to conceive as a group of best HRM practices oriented for increasing the environmental sustainability orientation of the dimensions and functions of an organization. The best Green HRM practices are consisted with green recruitment and selection, green employee empowerment in environmental problems, green teamwork, green communication, green training, green appraisal and green reward management (Jabbour, et al., 2010).

## **Commitment of Management**

The ways that management establishes and launches policies, make decisions, allocate resources and motivate employees to achieve goals. Managerial commitment is defined as engaging in and maintaining behaviours that guide others to achieve a goal (Cooper, 2006).

## **Business Environment**

Business environment consists with factors around the organization which are influenced on managers' and employees' decision making process. Business environment is defined as the combination of internal and external factors that impact on organization's operating situation (Hans, 2018).

## **Organizational Culture**

The set of values, norms, and believes of people in workplace and own subculture in workplace. Organizational culture is the characteristic and the tangible personality originated inside organization (Morcos, 2018).

## **Leadership Style**

The ways and patterns that managers guide and provide directions to subordinates and handle people management. Leadership style impacts organizational performance (Nanjundeswaraswamy & Swamy, 2014).

## **Information System**

It is the infrastructure for communication among internal parties and external parties of the organization. Through this process, organizations process data and distribute information. Information systems consist with a variety of information technologies to perform specific tasks, interact with different organizational contexts (Boell & Kecmanovic, 2015).

## **THEORIES RELATING TO GREEN HUMAN RESOURCE MANAGEMENT**

### **Environmental Accountancy Theory**

Environmental Accountancy Theory was developed by Bertalanffy in 1950, who contested that entities are with continuous interaction with environment where the company is operated. Behavior and activities of organizations influence the environment and thus company must be accountable for their activities.

There is an argument that, Environmental Accountancy Theory is concerned with capturing and identifying cost of environment with focus to mitigate them (Bertalanffy, 1950).

According to well defined “Triple Bottom Line”, through economic, social and environment approaches, environmental management is considered as a result of a wider accounting agenda (Sakwa, 2018).

Environmental Accountancy Theory argues that environmental contribution enhances the company's returns. It emphasizes the cost related environmental programme such as pollution controls, waste disposal and cleans up. These approaches may result in cost reduction annually by investing on GHRM practices.

According to Boselie, et al.(2005), Environmental Accountancy Theory argues that HRM practices are able to guide organization to foresee the cost reducing ways without losing skillful employees. The establishments of green economy have distinctive opportunities for development by following green practices and improving newer environment which are able to protect environment by reduction of carbon emission.

There are two main weaknesses in this theory. Firstly this theory focus entirely internal environment and does not focus the impacts from external environment. The second weakness is the theory does not provide the means by which green HRM approached despite the value of environmental sustainability being the basic/ primary objective (Sakwa, 2018).

## **Environmental Adaptation Theory**

Environmental Adaptation Theory was improved by the Hart in 1995, who emphasized that companies that adopt environmental strategies without environmental aptitudes are less influence to achieve company's strategic goals. The members of work force should have clear knowledge about the environment which they are working and adapt to changes of business environment. Moreover Environmental Adaptation Theory asserts the skillful and powerful employees who play a critical role to reaching at effective environmental strategies to be conducted as well as protect the natural resources for environmental sustainability. It means that Environmental Adaptation Theory promotes environmental sustainability and organizational sustainability. Implementation of Green HRM practices entail executing environmental friendly initiatives which lead to increase efficiency, better employee engagement and lead to lower costs (Sakwa, 2018).

Human activities often disrupt the environment. It means identifying and changing the casual human behaviour which is the best approaches in disruption and mitigating them (Jabbour, et al., 2010).

The importance of Environmental Adaptation Theory is the provision of the a basis for deciding conclusions on the employees' behaviour which are influenced for implementing Green Human Resource Management (Sakwa, 2018).

However the main limitation of Environmental Adaptation Theory, is that employees' behaviours are observed throughout a long period which is not possible considering the limited time period (Sakwa, 2018).

### **Factors Influencing Green Human Resource Management**

The implementation of Green Human Resource Management is impacted by different factors both internal and external to the organization such as government policy, top management commitment, leadership style and organizational culture (Sakwa, 2018).

Entities' green human capital is expanded through green selection and recruitment, green training and development and green performance management and green appraisal and green reward management system (Yusoff, Y.M., et al., 2018).

### **Government and Other organizations' Rules and Regulations**

Shrivastava & Berger (2010), mentions that the GHRM practices should comply with environmental laws and regulations of the country. According to that study, there are many regulations governing areas like environmental protection, pollution, practices which are certify the safe, healthy and clean environment. Organizations are obligated to comply with rules and regulations which are established by the government on the main environmental conditions which must exist to protect the members of company workforce. It means the implementation of GHRM practices should be complied with the government policies for environment (Sakwa, 2018).

There are agglomeration of rules, practices, policies and regulations from different parties which are influenced on green activities of an organization. GHRM practices refer to the aggregation of regulations, practices and policies that have the interests of green activities by different parties (Owino & Kwasira, 2016).

## **Supportive Commitment of Management**

There are previous research findings which mentioned that Managers' commitment, support and guiding are influenced on create, develop and success of green environment in a company. According to that, Daily & Huang (2001), mentions that, the process of Green HRM implementation is enriched with four criteria as managers, commitment, training, empowerment and rewards.

The company management including HR department expects to work on participative work environment that all employees have independence to think along solutions for green issues, because that is very important for success of GHRM (Ahmad, 2015).

The study conducted by the Renwick, et al. (2013), the Green HRM in USA, shows that the success of green HRM practices are mainly depended on the support, commitment and participation from top managers of the organization. These supports and commitments are from different ways such as financial allocations, establish policies and strategy, arrange training opportunities etc. Especially HRM must certify that they are applied in the green HR practices from initiation stages of their processes. The successful green HRM practices implementation based on the ownership and guide, support from senior management in public sector. The company top management should provide consent on greening the HRM and organization for the HR manager's to engage for green revolution within. Both top management and HR department must work together to introduce and implement green HRM.

## **Employee Engagement**

As per Tang, et al.(2018),complicated research study on Green HRM, According to his findings, employee participation for Green HRM from green practices like establishing green teams, give opportunities to write a green newsletter and contribute in decision making activities relating to environmental decision.

Perez, et al. (2009), argues that employees' green attitudes can be strong by developing environmental management systems. Furthermore Perez, et al. (2009), emphasizes that employees should change their values, norms and mindsets to set with organizations' Green Human Resource Management goals and culture.

As per Pinzone, et al. (2016), impact for growing green competence guide on collective green contribution of employees. There is a relationship between employee rewards and environmental behaviour with employee commitment



for Green HRM (Luu, 2018).

The top management develops systems for employee training, performance appraisals and reward management and offer green policies and behaviors to attract employees with ecological orientation. And also it gives positive changes to employees' green awareness, green knowledge, green attitudes to adopt GHRM at the workplace (Fernandaz, et al., 2003 ; Pham, et al., 2018).

There is an interactive impact GHRM practices on employee commitment to the environment framework (Blumberg & Pringle, 1982).

Promote employees to pay more attention on environmental protection, green values and green HRM by implementing the concept of green environmental protection (Zibarras & Coan, 2014). Green Selective Staffing, Green Training, Green Empowerment, Green Rewards, Green Career Opportunities, Green Teamwork, Green Work-Life Balance, Green Participation in Decision Making is indicators of GHRM (Ari, et al., 2020).

## **Organizational Environment**

According to the previous study on employee engagement, organizational environment impacts on implementation of Green HRM practices (Frank, et al., 2004).

The environment is a highly vital impediment facing the green HRM practice implementation in the current and future of the organizations. Both internal and external factors which are considered by the top management including company directors are affected on GHRM implementation (Sakwa, 2018). These environmental factors are consisted with resource availability, political factors, working conditions, technological factors and social factors. Changes of these factors are directly and indirectly influenced on the implementation of GHRM practices. According to that, the head of Human Resource Management department must always ensure that the Green HRM practices are always aligned to internal and external environmental changes in dynamic business environment (Frank, et al., 2004).

## **Organizational Culture**

According to study from green HRM by Florida & Davison in 2001, culture is a crucial factor that impacts on implementation of green HRM. The culture of an organization emphasizes the values of the natural environment and



encourages employees to share values. The basis for decision making for green HRM implementation is provided by the organizational culture.

### **Leadership Style**

According to Egri & Herman (2000), implementation of green HRM practices are affected from leadership styles. There are some of leadership styles that foster environmental participation and engagement of stakeholders are transformational and democratic leadership (Sakwa, 2018).

### **Green Information System**

Green information system is a factor which influences on green HRM. This study is concerned with the utilization of information systems to aid the dispensation of ecological goals through functions like teleconferencing, environment auditing and virtual collaboration. The Green information system infrastructure is considered as highly influenced factor on GHRM today.

### **Conclusion**

According to the empirical study there are factors influencing on the Green Human Resource Management in the organization. These factors are government and other parties' rules and regulations, Management Support, Employee Engagement, Environment, Company Culture, Green Information System. And also Green Selective Staffing, Green Training, Green Empowerment, Green Rewards, Green Career Opportunities, Green Teamwork, Green Work-Life Balance, Green Participation in Decision Making is indicators of GHRM.

### **Recommendations**

The study provides recommendations based on factors which influences on Green Human Resource Management for Sri Lanka Navy.

Green Human Resource management creates environmental friendly HR initiatives which results better employee engagement and retention. And also Green Human Resource Management supports to Sri Lanka Navy to reduce employee carbon footprints by teleconferencing, energy efficient office spaces, virtual communications, etc.

Furthermore, Sri Lanka Navy has growth opportunities through being green. It supports to achieve higher employee job satisfaction and commitment that guide to higher productivity and sustainability.

Moreover, Sri Lanka Navy will be able to enhance the reputation through following Green Human Resource Management practices. Sri Lanka Navy is able

to generate positive public relations through that.

Also, Green Human Resource Management makes employees aware of the natural resources more effectively and economically. It promotes employee morale. Green Human Resource Management reduces in the environmental impact of the Sri Lank Navy and reduces utility cost significantly. Sri Lanka is able to reduce their utility cost by using energy efficient technologies.

## REFERENCES

Ahmad, S., 2015. Green human resource management : Policies and practices. *Journal of Cogent Business and Management*, 02(01).

Ari, E., Karatepe, O. M., Rezapouraghdam, H. & Avci, T., 2020. A Conceptual Model for Green Human Resource Management: Indicators, Differential Pathways, and Multiple Pro-Environmental Outcomes. 2020 12 *Journal of Sustainability*, Volume 12, pp. 2-18.

Bertalanffy, V., 1950. The theory of open systems in physics and biology.. Volume 111, pp. 23-26.

Blumberg, M. & Pringle, C. D., 1982. The missing opportunity in organizational research: Some Implications for a theory of work performance.. *Academy of Management Review*, 7(4), pp. 560-569.

Boselie, J.P, Dietz, G., Boom, C., 2005. Commonalities and contradictions in HRM and Performance research. *Human Resource Management Journal*, 15(2), pp. 67-94.

Brockhaus, S., Kersten, W. & Knemyer, A. M., 2013. Where Do We Go From Here? Progressing Sustainability Implementation Efforts Across Supply Chains. *Journal of Business Logistics*, 34(02), pp. 167-182.

Cooper, D. (2006). The Impact of Management's Commitment on Employee Behaviour *American Society of Safety Engineers*.

Daily, B. F. & Huang, S. C., 2001. Achieving sustainability through attention to human resource factors in environmental management. *International Journal of Operation and Production Management*, 21(12), pp. 1539-1552.

Deegan, C. & Rankin, M., 1999. The Environmental Reporting Expectations gap:Australian Evidence. *The British Accounting Review*, 31(3), pp. 313-346.

Do nohue, O. & Torugsa, N., 2016. The moderating effect of 'green' HRM on the association between proactive environmental management and financial performance in small firms. *The International Journal of Human Resource Management*, 27(02), pp. 239-261.

Dumont, J., Shen, J. & Deng, X., 2017. Effects of green HRM practices on employee workplace green behavior: the role of psychological green climate and employee green values. *Human Resource Management*, 56(04), pp. 613-627.

Egri & Herman, E., 2000. Greening People:A Strategic dimension. *ZENITH International Journal of Business Economics and Management Research*, Volume 2, pp. 143-148.

Fernandaz, E., Junquera, B. & Ordiz, M., 2003. Organizational culture and human resources in the environmental issue. *International Journal of Human Resource Management*, 14(4), pp. 634-656.

Florida, R. & Davison, D., 2001. Gaining from Green Management: Environmental Management Systems inside and outside the Factory. *Sage Journal*, 43(1), pp. 64-84.

Frank, F. D., Finnegan, R. P. & Taylor, C. R., 2004. The Race for : Retaining and Engaging workers in the 21st Centaury. *Human Resource Planing*, 27(3), pp. 12-15.

Hans, V. B. (2018). BUSINESS ENVIRONMENT – CONCEPTUAL FRAMEWORK AND POLICIES. *Research Gate*, 4(3), pp.67-74.

Hart, S. L., 1995. A Natural-Resource-Based view of the Firm.*Academy og Management Review*, 20(04), pp. 986-1014.

abbour, C. C. J., Santos, F. A. & Nagano, M. S., 2010. Contributions of HRM throught the stages of environmental Management : Methodological Triangulation applied to companies in Brazil. *The International Journal Of Human Resource Management*, 21(7), Pp. 1049-1089.

Kocmanová, A. & Dočekalová, M., 2011. Corporate Sustainability: Environmental, Social, Economic And Corporate Performance. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, Volume Lix 20, Pp. 203-208.

Luu, T., 2018. Employees' green recovery performance: the roles of green HR practices and serving culture.. *Journal of Sustainable Tourism*, pp. 1308-1324.

Morcos, M. (2018). Organizational Culture : Definitions and Trends. Research Gate, pp.1-8.

Marta Pinzone, M. G. E. L., 2016. Progressing in the Change journey towards sustainability in Healthcare : The role of “Green” HRM. Journal of Cleaner Production.

Martinez-del-Rio, J., Cespedes-Lorente, J. & CarmonaMoreno, E., 2012. High-involvement work practices and environmental capabilities: how HIWPS create environmentally based sustainable competitive advantages.. International Journal of Human Resource Management, 51(6), pp. 827-850.

Moscardo, G. et al., 2013. Sustainability in Australian Business: Principles and Practice.

Nanjundeswaraswamy , T.S., & Swamy , D. R. (2014). Leadership styles .Advances In Management , 7(2), pp. 57-62.

Nejati, M., Rabiell, S. & Jabbour, C. J. C., 2017. “Envisioning the invisible: understanding the synergy between green human resource management and green supply chain management in manufacturing firms in Iran in light of the moderating effect of employees’ resistance to change”. Journal of Cleaner Production, Volume 168, pp. 163-172.

Opatha, H. H. & Arulrajah, A. A., 2014. Green Human Resource Management. International Business Research, Volume 7, pp. 101-112.

Owino, W. A. & Kwasira, J., 2016. Influence of selected green human resource management practices on environmental sustainability. Menengai Oil Refinery Limited, Nakuru, pp. 4-19.

Perez, A. et al., 2009. Tithonia Diversifolia. A Gray Pastos Forrajes, 32(1), pp. 1-15.

Pham, N.T., Tuckova. Z, Jabbour, C.J.C, 2019. Greening the hospitality industry: how do green human resource management practices influence organizational citizenship behavior in hotels? A mixed-methods study. Tourism Management, Volume 72, pp. 386-399.

Pham, N. T., Phan, Q. P. T., Tuckova, Z. & Nguyen, L. H. L., 2018. Enhancing the organizational citizenship behavior for the environment: the roles of green training and organizational culture.. Management & Marketing Challenges for

the Knowledge Society, 13(4), pp. 1174-1189.

Pinzone, M., Guerri, M., Lettieri, E. & Redmon, T., 2016. Progressing in the change journey towards sustainability in healthcare: The role of "Green" HRM. *Journal of Cleaner Production*, Volume 122, pp. 201-211.

Renwick, D. W. S., Redman, T., & Maguire, S., 2013. Green Human Resource Management. *International Journal of Management Reviews*, 15(1), pp. 1-14.

Renwick, D. W. et al., 2016. Contemporary Developments in Green (Environmental) HRM Scholarship. *The International Journal of Human Resource Management*, 27(02), pp. 114-128.

Sakwa, S. M., 2018. Factors Affecting Implementation of Green Human Resource Practices in the Civil Service in Kenya, Nairobi: School of Business University.

Schoemaker, R., 2019. Green Human Resource Management: a general review. Tilburg University Bachelor thesis.

Shrivastava, P. & Berger, S., 2010. Sustainability Principles: A review and directions. *Organization Management Journal*, 7(4), pp. 246-261.

Tang, G. et al., 2018. Green Human Resource Management Practices: Scale Development and Validity. *Asia Pacific Journal of Human Resources*, 56(1), pp. 31-55.

United Nations Environment Programme, 2019. Programme Performance Report, Nairobi: United Nations Environment Programme.

Yusoff, Y.M., Nejati, M., Kee, D.M.H., Amran, A., 2018. Linking green human resource management practices to environmental performance in hotel industry. *Journal of Global Business Review*, 21(3), pp. 1-18.

Zibarras, L. & Coan, P., 2014. HRM practices used to promote pro-environmental behavior: A UK survey. *Int. J. Hum. Resour. Manag.*, Volume 26, pp. 2121-2142.

## MARITIME SECURITY ISSUES IN THE INDIAN OCEAN REGION

Lieutenant Pramod Liyanapathirana



### Abstract

**T**he Indian Ocean region is geo strategically located at the forefront of global energy policy in other words issues associated with energy growth and usage as well as energy production, distribution, and consumption globally due to its basic lines of communication. For both coastal countries and foreigners who want to use this region to maintain their strategic game, the Indian Ocean acts as a strategic lagoon. However, within the process of geopolitical rivalry, some fundamental maritime security concerns such as climate and environmental issues are ignored, beyond traditional military threats. Based on reports on climate change, this article focuses on traditional and non-traditional maritime security threats. These threats, such as rising sea levels, ocean acidification and unregulated fishing, are not only threats to the environment, but also to security. These threats are escalating at a rapid rate and their neglect could lead to a catastrophe that could affect not only the political economy of the coastal nations of the Indian Ocean, but also the global economy. This is mainly due to the fact that the Indian Ocean serves as a trade route for world trade, as more than eighty percent of world energy trade passes through the region. The mainly based research question is "Why traders more concern about financial profit by omitting environmental pollution safety and security". Therefore the objective of this study is to minimize the above mentioned risks. This article mainly focuses on piracy and armed robbery, drug trafficking and illegal migration, the illegal movement of weapons of mass destruction, and natural disasters. Finally, this article offers the recommendations on maritime safety issues.

**Keywords:** Maritime security issues, Indian Ocean Region (IOR), Non-traditional security threats.

### Geostrategic Importance of the Indian Ocean Region

The Indian Ocean, located at the crossroads of Africa, Asia and Australia, is home to several coasts that play a key role in the region. IOR is a vital seaway, with narrowing points such as the Strait of Hormuz, the Strait of Malacca, Bab-el Mandeb, etc. These obstacles are of extraordinary strategic importance, since much of the trade passes through them. These barriers are exposed to piracy, international disputes, political divisions and accidents. To avoid such threats and maintain a strong position in this resource-rich region, regional and external powers are major points.

When it comes to geostrategic importance, the IOR's "security dynamics" plays an equally central role. In the same perspective, the Persian Gulf in

the Arabian Sea also plays an equally important role in India's security perspective. India's main objective in this area is to protect sea lines of communication (SLOCs), fight with piracy threats in the Horn of Africa and the Red Sea. The Indian Navy has warships stationed in the Gulf of Oman and the Persian Gulf to ensure safe passage for Indian-flagged ships operating in the region. India has also established the Information Fusion Center - Indian Ocean Region (IFC-IOR) to closely monitor the movement of ships in the region (Ghosh, 2020).

### **Non-Traditional Maritime Threats**

According to Cabellero Anthony (2016), non-traditional security problems are challenges to the survival and well-being of individuals and states that derive primarily from non-military sources. Safety problems arising from socio-economic factors on land often violate the maritime sector. Those violations, coupled with the homogeneous nature of the ocean, in which the high seas remain without jurisdiction, have facilitated the widespread spread of non-traditional threats to security in the Indian Ocean. These include terrorism, piracy, drug and human trafficking, natural disasters, and the illegal movement of weapons, including weapons of mass destruction.

### **Piracy and Armed Robbery**

According to Captain Singhal's article, heavy traffic and limited naval surveillance in the Indian Ocean have fueled piracy, which in the past decade has become a major threat in the Red Sea, the Somalia Basin and the Straits of Malacca. Although this manifestation of illegality at sea has its origin on land, in a collective effort to protect commercial transport, many nations have deployed their warships off the coast of Somalia. This has led to a decrease in piracy attacks in the last three years, with only 15 ships reporting attacks in Somalia in 2013 compared to 237 attacks in 2011. Similarly, hijacking incidents dropped to two in 2013 14-2012 and 28 in 2011. However, piracy attacks increased steadily in Indonesian waters during the same period (Singhal, 2013).

Despite the threat, contributions to anti-piracy operations remain limited to the main regional and extra-regional players. A pan-regional mechanism has not emerged mainly due to the lack of regional capacity and the lack of a regional security framework.

### **Drug Trafficking and Illegal Migration**

There is a close link between drug trafficking, narco-terrorism and the proliferation of small arms. Illegal migration and clandestine drug trafficking to and around the Indian Ocean are manifestations of political unrest and government failure. This threat has been joined by the unregulated movement of ships, the transport of containers. Drug trafficking crosses the Golden Crescent



(Pakistan, Iran and Afghanistan) and the Golden Triangle (Burma, Thailand and Laos), leading to money laundering with funds that fuel arms trafficking, insurgency and terrorism. Trafficking in human beings is another international security problem that aggravates socio-political instability (Singhal, 2013).

A direct effect at the end of the Cold War was the rapid spread of small arms, which posed a serious threat to internal security in many countries. It represents a serious threat to national and regional security by changing the balance of power between state and sub-state groups which consist insurgents, terrorists, and drug traffickers. As these issues take on serious dimensions in the Indian Ocean Region, the regional community must work together to address these strong threats to national sovereignty (Singhal, 2013).

### **Illegal Movement of Weapons of Mass Destruction (WMD)**

According to Captain Singhal's article, globalization, which is entirely dependent on the free movement of international maritime trade, also opens up economic opportunities for people. However, thieves and terrorists also grab these opportunities, using maritime trade to smuggle WMD materials. While diplomacy can be used as a key weapon to combat proliferation. The Proliferation Security Initiative (PSI) to promote the interception of illegal shipments of weapons of mass destruction was not registered with the IOR. In addition to the lack of UN approval, PSI faces two main legal challenges. First of all, the possibilities to stop, board and search boats without authorization are limited by the law of the sea. Second, illegal materials from weapons of mass destruction cannot be easily seized and traffickers cannot be prosecuted because their transportation is not an international crime.

The Indian Ocean is too wide for any country to contain illegal movements without exchanging information. While technology can be used to achieve accurate maritime domain awareness (MDA), it is more important that available nations work together to share information and create a united front (Singhal, 2013).

### **Maritime Terrorism**

Maritime terrorist attacks pose a threat throughout the Indian Ocean Region due to the presence of terrorist groups, including Australia's Northern neighbours. The terrorist attack in Mumbai in November 2008 showed the dangers of terrorist attacks at sea if the coastal waters are not safe. Attacks on structures offshore have occurred in the past. Three Iraqi oil terminals in Iraq were attacked in the Persian Gulf in 2003 by ships loaded with explosives. Terrorists planning a terrorist attack in Australia will recognize that offshore that oil and gas facilities in North West Australia are a major national vulnerability that is not adequately protected. Arrangements to protect these devices, port-



terminals, and pipelines are major concerns for our national security planning. The Australian Defence Force and other security forces should be able to respond quickly to a brief notification of a terrorist threat to coastal and offshore infrastructure. However, due to the location of the existing defensive bases, the Australian Defense Force is not currently in this position(Raymond, 2007).

## **International Crime**

Organized crime, business and smuggling are increasingly linked to global patterns of violence. Drug and weapons smuggling are very common in most of the Indian Ocean region. The sea offers international criminal associations, rogue traders and non-state actors an easy way to distribute their assets or provide fighters with highly sophisticated weapons. Due to the emergence of conflicts and unrest, arms dealers find a ready market in areas such as the Horn of Africa, Afghanistan, Sri Lanka and Indonesia. It is estimated that up to ninety five percent of "hard" drug production takes place in conflict zones, such as heroin and cannabis in Afghanistan. Organized crime is also involved in most of the trade in counterfeit products, ranging from small cigarettes to famous models and brand name drugs. It is estimated that up to fifty percent of all pharmaceuticals sold in Africa and Asia can be counterfeit. While the entire coast of India is vulnerable to underground smuggling landings, the Gujarat-Maharashtra coast, the Tamil Nadu coast, the Sunder bans in West Bengal, and the Andaman and Nicobar Islands have been particularly prone to such activities (Wijegunaratne, 2012). People in low-income areas are constantly looking for illegal ways to get around the developed world.

## **Human Trafficking**

From Sri Lanka's point of view, illegal migration occurs mainly for economic reasons. With the removal of the LTTE on the ground in Sri Lanka, terrorists may also migrate illegally encouraged by their foreign networks and may also be involved in border trafficking(Migration, 2005).

Sri Lanka's geographical position is also one of the closest reasons for the increase in human trafficking. In the past, many illegal asylum seekers have used Thailand and Indonesia as transit points. But now it has changed. Sri Lanka has been identified as a transit point for human traffickers. Increase in incidents of foreigners using Sri Lanka to board ships, the number of locals traveling the same dangerous route (Wijegunaratne, 2012).

## **High Resource Competition**

Due to increasing global prosperity and technological advances, competition for resources within and below the oceans is increasing, especially energy and protein. Global energy consumption is growing significantly, especially en-

ergy and protein. Global energy consumption is growing significantly, especially in Asia and the Middle East. The fast-growing economies of India and China are expected to be large energy consumers in the future. As national efforts to control energy sources and secure energy transport increase, some observers argue that energy competition could lead to major conflicts. However, the contrary view is that it is in the common interest of the powers concerned to maintain a stable business environment (Cristina, 2009).

The availability of oceanic fish stocks poses major food security issues, both regionally and globally. The importance of fishing will increase dramatically in the Asia Pacific or Indian Ocean region due to population growth and economic growth in China, India, and other Asian countries. Globally, fish stocks are under severe pressure. According to conservative estimates, eighty-seven percent of marine fishstocks are in crisis or fully utilized. Illegal, unreported and unregulated fishing is expected to increase as fish stocks in traditional fishing grounds are depleted and fishers will be forced to move to deeper and more distant waters. Many countries in the Indian Ocean depend on inshore fisheries for their protein needs and therefore have national concerns about the management of fish stocks (Cristina, 2009).

### **Climatic Changes**

Sea temperatures around equatorial areas in the IOR are rising faster than elsewhere. The likelihood of significant changes in the monsoon season has increased, which could create drought conditions in much of South Asia. There is evidence of an increase in the percentage of very strong storms with maximum wind speeds and heavier rains associated with rising tropical sea surface temperatures. Changes in the frequency and strength of extreme weather events, along with rising sea levels, are expected to have very negative effects on natural and human systems. Many places in the Indian Ocean region are particularly vulnerable. Coastal areas will be at high risk due to increased flooding from the sea and, in some deltas, flooding from rivers. The densely populated delta regions that abound in South and Southeast Asia are largely vulnerable.

Climate change is expected to delay the sustainable development of most coastal countries in Asia and Africa, as the pressures of rapid urbanization, industrialization and economic development increase on natural resources and the environment. The expected rise in sea level will have a major impact on coastal regions (Singhal, 2013).

### **Approaches to Cooperative Security**

Events in the post-Cold War era have raised awareness of the need to redefine the nature of international security. Collectively, a number of non-tra-

ditional security challenges at the Indian Ocean Region exceed the ability of any unit to manage them effectively. Recognizing the challenges surrounding the Indian coastline, the Indian Naval Doctrine emphasizes the shift from conventional combat to the inclusion of non-traditional threats, emphasizing the benign and policing role of IOR (Kim, 1998).

Despite extra-regional naval contributions to protect pirate ships, large-scale deployments may not be economically viable in the future. Therefore, in the short and medium term, maritime safety in the IOR must be developed through stable and sustainable cooperation between the main regional actor (Singhal, 2013). This would require collaboration on policy coherence, creative thinking, longevity of participation, and resource sharing.

## Recommendations

- a. **Focusing More on Safety than Security.** Nations are examining security issues very carefully and are reluctant to commit to participate. Non-traditional maritime threats can be viewed from a security or safety perspective. However, "security" threatens sovereignty, while "safety" does not. To overcome mental barriers and create a more conducive environment, collaborative approaches must be based on "maritime safety" rather than "maritime security" (Singhal, 2013).
- b. **Contributions from Key Stakeholders.** Although members from South Africa, Tanzania, Kenya and the Gulf Cooperation Council are major players in the Indian Ocean maritime trade, their contributions to the police and their benign role are negligible. Diplomatic channels, including maritime diplomacy, should be used to persuade them to allocate resources and develop an inclusive atmosphere that fosters regional maritime cooperation. Shipping companies must adhere to basic safety requirements when operating in hazardous areas and must always take proper care of their crew and cargo. They will have to invest in superior passive protection measures and take active measures as needed. Police and security services should actively fight international criminal groups involved in piracy as soon as possible to reduce the withdrawal of piracy. It must also prevent the use of piracy by terrorist organizations to further their objectives.
- c. **Regional Integration.** It is important to expand regional integration through strong defence cooperation measures aimed at being proactive in events such as natural disasters, search and rescue operations, and marine pollution incidents, in close coordination with regional ships and the Coast Guard. Such formation of protective cooperation measures necessarily requires going beyond traditional models and

focusing on better cooperation and collective action in the Indian Ocean-region.

## Conclusion

The above mentioned natural and man-made issues are the major security issues in the Indian Ocean Region. The non-traditional security issues that generated by resource, climate change and environmental concerns presenting unusual security challenges into the future. So the Indian Ocean Region should take immediate actions to reduce these traditional as well as non- traditional security challenges. Many marine security issues have been discovered in the Indian Ocean and Sri Lanka, according to the study. International and non-traditional difficulties are becoming more common. Soft power's influence has grown in recent years, and it now comprises a significant portion of the global economy. A significant maritime challenge the marine borders between the two countries. In 1974 and 1976, India and Sri Lanka were firmly recognized as Component of the two countries' bilateral agreement it is nonetheless. Long-term initiatives are needed not only to modernize, update, and enhance the fleet, but also to solve policy and decision-making inadequacies. In the Indian Ocean, defense is required, and the US should pursue a long-term maritime security policy in close strategic cooperation with significant nations such as Japan and Australia.

## REFERENCES

Cristina, N., 2009 May. Maritime Human Resources Competitiveness Through Proper Implementation. Maritime Human Resources Competitiveness Through Proper Implementation, Pp. 398-400.

Ghosh, P., 2020. India's Indian Ocean Region Strategy.

Kim, L. D.-K., 1998. Cooperative Maritime Security In Northeast Asia. Cooperative Maritime Security In Northeast Asia, 52(1), Pp. 53-77.

Migration, I. I. O. F., 2005. Data And Research On Human Trafficking:a Global Survey. Geneva: International Organization For Migration.

Raymond, C. Z., 2007. Maritime Terrorism In Southeast Asia: A Risk Assessment. Issue 2 Ed. S.l.:Online.

Singhal, C. D., 2013. Piracy And Armed Robbery. Cooperative Mechanisms To Address Non Traditional Maritime Security Threats In Indian Ocean Region.

Wijegunaratne, R. A. R. C., 2012. Maritime Security Concerns In The Indian Ocean.

**ADMIRAL CLANCY FERNANDO  
ESSAY COMPETITION 2020**



**1<sup>ST</sup> PLACE OF EACH CATEGORY**

**"READING MAKES A MAN PERFECT"- FRANCIS BACON.  
HOW CAN WE ACHIEVE THIS IN SLN WITH THE AIM OF BUILDING  
AN INTELLECTUALLY SOUND NAVY TO MEET THE GLOBAL  
STANDARDS**



Commander (G) Priyadarshna Udakumbura, RSP\*, USP ,psc , MSc(D&SS), MA in  
DS (UK), BSc(Ds)Hons

*"The British write the best doctrine in the world. Fortunately, they never read it"*

*Field Marshal Erwin Rommel*

## **Introduction**

Reading, writing and learning are going hand in hand in every process of education system. Reading along will directly affect to other two aspects as it will be the process of absorbing knowledge from outside. In the military, war fighting is not a mere annihilation of enemy. It is a process of studying history, learning strategy, understanding doctrines, planning and swift execution of plan. It requires wealth of knowledge to implement, the entire process and achieve the victory.

Field Marshal Erwin Rommel had once mentioned above quotation when the British Army was continuously failing in France during World War II. This statement clearly indicates that war fighting is required good reading of written doctrines and implementation when it is required. Lack of good reading is lack of victory.

The knowledge of SLN personnel in various field in various capacity are essential to be an intellectually sound navy. The changing global environment is challengeable for all navies in the world and knowledgeable man power is a must to sustain in future. The knowledge can be obtained mostly through good readings. In this endeavour, SLN should determine to produce intellectually sound naval personnel by inculcating reading habits among them.

In the 16<sup>th</sup> century, the British Philosopher Sir Francis Bacon stated that the importance of reading as 'Reading Makes a Man Perfect'. There is no doubt on this statement that this practice definitely transform a person to highly intellectual person. There are many famous personalities who have improved the knowledge through readings and served for the betterment of people in world history.

Therefore, this essay will discuss what reading is , what are the benefits of reading,are why people are reluctant to read in general as all these factors are common for every human being. Why SLN personnel should read and as recom-

mendations, how SLN inculcates reading habits to create intellectually sound naval personnel are discussed in depth with regards to SLN. Finally, conclusion will highlight the final findings.

### **What is Reading?**

Many experts have given their definitions about what really reading means. Reading is a very important skill that everyone must master, as or since the reading can not be separated in the process of teaching and learning. Reading is the most important activity among communities, not only as a source of information, but also as a means of consolidating and extending one's idea and knowledge of language (Rivers, 1968). According to Nunan (Nunan, 2003), reading is a fluent process of readers combining information from a text and their own background knowledge to build meaning. Mikulecky states that reading is a complex conscious and unconscious mental process in which the reader uses a variety of strategies to reconstruct the meaning that the author is assumed to have intended, based on data from the text and from the reader's prior knowledge (Mikulecky, 2011) (Putra, 2017). According to Grellet, Reading is an active skill. It constantly involves guessing, predicting and asking oneself questions (Khoriyah, 2010).

### **What are the Benefits of Reading?**

The people start reading for various reasons. Children read for fun and to improve comprehension, students read for knowledge and examinations, and adults read for information and knowledge. Reading accompanies people to world they have never seen, introduces people who have never met and imparts emotions might never feel. Reading develops mainly two things in a human body. One is personal ability and the other one is health benefits.

Reading builds vocabulary. Reading researchers as far back as the 1960s have discussed what's known as 'the Mathew Effect' a term that refers to biblical verse Mathew 13:12. The Mathew Effect sums up the idea that the rich gets richer and poor gets poorer (Stanborough, 2019). A concept that applies as much to vocabulary as it does to money. Accordingly a person who reads more can build his vocabulary more. This will lead to be a good speaker as well as a good writer.

Sir Francis Bacon once mentioned that the 'Knowledge is power'. Everything a person reads augments the existing knowledge with new bits of information, and never knows when it may come in handy. The more knowledgeable person is better equipped to tackle any challenge he will ever face (Simmons, 2018). A naval person with good knowledge will repute in many ways. As Julius Caesar once mentioned that "Lack of knowledge, lacked confidence- Lack of confidence, lacked victory". This statement has been a valid saying since an ancient time to present.



Researchers have found that reading improves memory of mind. When a person reads a book, he has to remember variety of characters, their backgrounds, ambitions, history and tones. Comparatively these are difficult to remember but brain is a marvellous thing that can remember, these things with relative ease. Reading will improve memory of mind and strengths existing ones which assist in short term memory recall as well as stabilizing moods(Winter, 2020).

Strong analytical thinking skills are important for day to day work of people to survive in this modern world. If the reader carefully reads the books, he or she will be able to mind map the sequence of the narration or facts in the book. Reading of some pieces of books really improve logical reasoning through critiquing the whole story such as determining whether it was well written piece, the characters were properly developed and the storyline ran smoothly and etc(Brown, 2020).

Most of good writers are the best readers. This goes hand in hand with the development of vocabulary. When a person exposes to good written pieces of documents, the vocabulary and information of subject matters improve remarkably. The style of writing and comprehension ability also will gradually improve as the musician influence one another and painters use techniques established by previous masters. Same way, writers learn how to craft by reading works of others (Patterson, 2018).

The skilled communicator is an asset in present day management concepts. To be a good orator, the person should get experience from other people and should possess rich vocabulary along with the information for an effective presenting. The good reading builds a solid foundation for communication. Reading connects person to the world and helps to acquire communication skills as a reader understands more about different things through various reading materials(Wiuter,2020).

In addition to above personal ability, the health benefits of reading are more important in this busy world. The Mental Floss website has highlighted five scientific reasons that a person should read more;

- Reading reduces stress.
- Reading books may increase life expectancy.
- Reading enhances empathy.
- Reading boosts creativity and flexibility.
- Reading can help to transform as a person(Fagan 2018).



## Why People Reluctant to Read?

If a group of people are questioned about last reading of their life, they will not be able to tell what the date was. It is not a surprise that people can not remember their last reading dates as reading habits are fading with the time. One of the studies conducted in USA indicated that 24 percent of adult Americans have not read any books completely or partly during 2019. Further, survey indicated that almost 37 percent high school degree holders have not read any book in 2019 (Brown 2020). The problem is very clear that people are reluctant to read. Therefore, the question is why people do not read?

One of the most common reasons is lack of time. People are busy with the modern day world with many distraction and diversions from normal life patterns. People work for their basic needs throughout the day and difficult to find time to read. If leisure time is available, they are more prone to stay with loved ones. Further, people want to maintain work-life balance in day to day life. Therefore, free times available are likely to share with kids, wife and other family members (Cronk, 2019).

Another reason is lack of patience and wondering mind. Present day with fast moving world, people want facts and figures to be in finger tips. Reading books and articles requires more time to spend on facts finding. Hence the people dislike to spend more time and they break patience. Further, lack of focus is also a big reason for not to read. Reading requires full concentration and it will energize desire of continue reading but if a mind keeps wondering, the reading will be quitted (Brown, 2020).

Watching movies, addiction to social media and internet are one of the key barriers for reading. People like to enjoy life in easy way such as watching a movie as it is quicker and more engaging. The movie will give all entertainment aspect whereas reading does not provide. Addiction to social media kills most of the time available for good readings. When people start to surf social media, these sites are built in such a way that they steal people's time without letting them knows (Cronk, 2019).

Parents' reading practices influence an childhood reading habits. If a child did not practice reading habit during his childhood he or she may be reluctant to read when he or she grows up. Reading at home boosts school performance later on. It also increases vocabulary, raises self-esteem, builds good communication skills and strengthen the brain (Stanborough, 2019).

Insufficient reading skills negatively affect on improving of reading. One of the surveys has found that poor reading skills were in fact a threat to adult's educational achievements. People who indicated more educational achievements have shown improved reading skills (Aarnbak, 2004). When adults are

lack of reading skills, they will reduce the enthusiasm to read books as it's not positively support.

People do not know what they have to read and they believe that reading is too hard. If a person does not have a habit of reading, he or she should not start with what they want to read, instead they must start with what make you enjoy by reading. Later on, you will make connection with books what you actually want to read once you inculcate the habit of reading(Lombardi,2019).

The language is a barrier to read desired books and compulsory reading books. The naval books with old English perhaps discourage officers to read as their lack of reading skills and comprehension ability. However, researchers found that the powerful network of brain connections can be improved and grown from reading and successfully learning a second language(Spector,2019).

All in all, above all facts have been discussed with regard to why people are reluctant to read more or less equally applicable to SLN. The naval personnel are showing same reasons to avoid good reading to improve professional knowledge and career.

### **Why do SLN Personnel Need to Read More?**

The reading has more influence on shaping and moulding of a naval personnel from the beginning of his or her career. Understanding of basic theories and knowledge could be achieved in the classroom or practical exercises yet the confirmation of ideas and broadening of knowledge are self-initiatives particularly through readings. Intellectually sound navy is timely necessity to go forward SLN while achieving global standards. In this process, there are many reasons for naval personnel to be a good reader.

History repeats every time. The naval personnel must read historical books especially military history and commonly general history. The experiences, knowledge possess and gambit of tactics used by former well-known military commanders should be studied by young naval officers. This habit will enhance the professional knowledge which requires to lead men under him. Just before former Secretary of Defence, USA retired Marine General James Mattis was getting ready to deploy to Iraq in 2004, one of his colleagues reminded him about the importance of reading for military officer who sometimes found themselves " too busy to read". The answer from this legendary General was "the problem with being too busy to read is that you learn by experience (or by your men's experience), that is the hard way. By reading, you learn through others experiences, generally a better way to do business, especially in our line of work where the consequences of incompetence are so final for young men"(Fehrle,2017).

The ship that the naval officer commands will always go beyond terri-

torial waters and more often needs to carry out duties in international waters. During this command tenure, sometimes the officer has to play a diplomatic role by representing the country. The knowledge pertaining to international affairs, treaties, agreement, current issues, international norms and etc will come in handy to deal with any kind of situation.

Naval Planning Process, Mission Command and concept of Manoeuvrist Approach are best tools for a naval commander to exercise duties. These concepts are broadly discussed in various manuals, doctrines and books in world wide. Recently published SLNBR1- Maritime Doctrine of Sri Lanka (MDSL) also indicated these concept and further reading are essential to understand the breath and depth of the concepts.

Indian Field Marshal Sam Manekshaw has once mentioned that "professional knowledge and professional competence are the main attributes of leadership. Unless you know, the men you command, know that you know your job, you will never be a leader"(Taneja,2018). Decision making ability is a key tenant of naval leaders. It requires professionalism, knowledge, experience and etc. These facts are required to gain by self-reading. Intense reading and searching of various expert ideas, following biography of well-known military characters and data collection are essential to develop decision making skills. Lack of above skills will lead to disaster in the military career.

Best practices of Human Resource Management in public domain are used in present day operational environment and peacetime operations. These concepts are evolved time to time with the help of new concept found by researchers. The naval personnel should read these new concepts and follow the best practices in order to solve the human resource management issues of new generation under the command.

General knowledge and common sense are important aspects for the naval personnel. SLN operates in complex situations that demands each person should be knowledgeable not only naval affairs but also economics, politics and international affairs. Further, SLN officers are required to prepare themselves for Staff Qualification and National Defence College in the ladder of career. Preparation for above courses and during the courses, extensive readings are essential to complete the courses successfully.

## **Recommendations**

As the essay has discussed, inculcating reading habits can not be achieved over night or miraculous work. It requires systematic work from the Naval Headquarters level and commitment of individuals. Following findings could be derived from above facts that how best SLN can inculcate reading habits to build intellectually sound navy. This effort will take time to reap the benefits of implementation.

Naval Headquarters needs to implement few efforts in order to encourage naval personnel to improve reading habits as follows;

- Issuing of recommended reading list by Commander of the Navy for the different levels of officers and sailors as it is practiced in US Army. This will improve minds through reading and critical thinking(Stout,2015).
- Five year campaign like “Wisdom through Readings” to be launched in different level to improve readings.
- Few strategies like conducting Book Exhibitions, Book Talk, Story Talk Session, Creative Activities or creative writing, Book Clubs and debating will encourage SLN personnel to read more.
- Obtaining membership of various academic sites with the help of Directorate of Naval Information. These memberships can be used by SLN personnel to find valuable books and articles without wasting time and money.
- Provide opportunity to reach electronic books and documents through Navy sponsored system and facilities should be created to issue Electronic Reading Device such as Kindle Paperwhite or Kobo Forma on install payment basis from Navy.

As an individual, all naval personnel should understand the importance of reading for career development, personal life and for general knowledge. Following are the findings to improve reading habits from above facts;

- Read anything that reader feels to read. Reading for pleasure is about finding a book that works for reader: whether it's a short story, a classic novel or a comic book, requirement is to 'start reading'(Gifford,2019).
- Try to read short story that will increase patience.
- Find a hero who admire reader's life. If reader interests to read Admiral Horatio Nelson, try to read about him.
- Too busy to read does not mean that do not have a time. Find a time to read from daily time table and scheduled it.
- Take advantage of 'edge time'. The time spends in bus, train, waiting for appointment, at the Airport and etc. Think that time is as 'Edge Time' and make use of that for reading(Haden,2018).
- Grab all the opportunities to write and speak.

## Conclusion

Reading is a fascinating work for naval personnel to enhance knowledge and intellectual ability. Reading will improve vocabulary and comprehension ability of a person. A person who reads more can be a good speaker and good writer. Above traits are essential to be a good leader and commander. It is common a trend that people are reluctant to read due to distraction of modern day readily available new technological device and applications. However, improving of reading skills is essential. Reading habit can be inculcated with the assistance of SLN and the self-motivation of individual personnel. Each and every one of naval personnel should understand the broadening of various knowledge is paramount in this fast moving world. Without sound knowledge and professional competency, it is highly unlikely to sustain in future. Further, to above, the centuries old statement of 'Reading Makes a Man Perfect' is remaining as a valid statement for today as well. Let's build a professionally and intellectually sound navy by inculcating reading habits in SLN.

## REFERENCES

Arnbak, E. (2004) 'When are poor reading skills a threat to educational achievement?', *Reading and Writing* 2004 17:5. Springer, 17(5), pp. 459–482. doi: 10.1023/B:READ.0000044595.76174.CC.

Brown, A. (2020) 'Do You Know Why People Don't Read Books', HoneyReads. Available at: <https://www.honeyreads.net/do-you-know-why-people-dont-read-books.html> (Accessed: 10 August 2020).

Brown, J. (2020) 15 incredible benefits from reading every day [online]. Available at: <https://ideapod.com/15-incredible-benefits-reading-read-every-day/>. (Accessed: 16 August 2020).

Cronk, M. (2019) 5 Reasons Why Adults Don't Read Books - Sartorial Geek, The Sartorial Geek. Available at: <http://sartorialgeek.com/5-reasons-why-adults-dont-read-books/> (Accessed: 10 August 2020).

Fagan, A. (2018) 6 Scientific Reasons You Should Be Reading More, MENTaL FLOSS. Available at: <https://www.mentalfloss.com/article/541158/scientific-reasons-you-should-read-more> (Accessed: 8 August 2020).

Fehrle, B. (2017) Importance of Reading in a Military Career, 117th Air Refueling Wing. Available at: <https://www.117arw.af.mil/News/Commentaries/Display/Article/1133307/importance-of-reading-in-a-military-career/> (Accessed: 8 August 2020).

Gifford, B. (2019) 9 Tips to Rebuild Your Reading Habits [online]. Available at: <https://happiful.com/9-tips-to-rebuild-your-reading-habits/>. (Accessed: 16 August 2020).

Haden, J. (2018) How to Read a Lot More Books (Especially If You Don't Like to Read), Inc.com. Available at: <https://www.inc.com/jeff-haden/how-to-read-a-lot-more-books-especially-if-you-dont-like-to-read.html> (Accessed: 10 August 2020).

Khoiriyah and Sulistyani (2010) EMPOWERING RECIPROCAL TEACHING IN TEACHING READING COMPREHENSION. Available at: [https://www.academia.edu/36294178/EMPOWERING\\_RECIPROCAL\\_TEACHING\\_IN\\_TEACHING\\_READING\\_COMPREHENSION\\_Khoiriyah](https://www.academia.edu/36294178/EMPOWERING_RECIPROCAL_TEACHING_IN_TEACHING_READING_COMPREHENSION_Khoiriyah) (Accessed: 8 August 2020).

Lombardi, E. (2019) Why We Don't Read, ThoughtCo. Available at: <https://www.thoughtco.com/why-people-dont-read-738494> (Accessed: 8 August 2020).

Nunan, D., Terrell, T. D. and Brown, H. D. (2003) When ordering this title , use ISBN 007-123462-4, Language.

Patterson, A. (2018) 'Why you need to read more books', Writers Write. Available at: <https://www.writerswrite.co.za/why-you-need-to-read-more-books/> (Accessed: 10 August 2020).

Putri, A. K. and Ohoiwutun, J. E. (2017) 'Using Collaborative Strategic Reading (Csr ) To Develop Reading Comprehension of the Second Year Students', English Language Teaching Society (ELTS), 3(2), pp. 1–9.

Rivers, W. M. (1968) 'Teaching foreign-language skills', in Teaching foreign-language skills. University of Chicago Press, p. 24.

Simmons, M. (2018) 'The Way You Read Books Says A Lot About Your Intelligence, Here's Why', Medium. Available at: <https://medium.com/accelerated-intelligence/the-way-you-read-books-says-a-lot-about-your-intelligence-find-out-why-c2127b00eb03> (Accessed: 8 August 2020).

Spektor, B. (2019) Benefits of Reading: Why Your Brain Needs to Read Daily, Reader's Digest. Available at: <https://www.rd.com/article/benefits-of-reading-books/> (Accessed: 8 August 2021).

Stanborough, R. J. (2019) Benefits of Reading Books: For Your Physical and Mental Health, www.healthline.com. Available at: <https://www.healthline.com/health/benefits-of-reading-books> (Accessed: 8 August 2020).

Stout, M. (2015) Military Reading for Professional Development? Stop Being So Lazy, Work on the Rocks. Available at: <https://warontherocks.com/2015/10/military-reading-for-professional-development-stop-being-so-lazy/> (Accessed: 8 August 2020).

10 August 2020).

Taneja, R. (2018) 'A Yes Man Is A Dangerous Man': Top Quotes From India's First Field Marshal, NDTV. Available at: <https://www.ndtv.com/india-news/sam-manekshaw-104th-birth-anniversary-top-quotes-from-india-s-first-field-marshal-1832144> (Accessed: 10 August 2020).

Winter, C. (2020) '10 Benefits of Reading : Why You Should Read Every Day; pp. 1–19. Available at: <https://www.lifehack.org/articles/lifestyle/10-benefits-reading-why-you-should-read-everyday.html> (Accessed: 8 August 2020).



**"READING MAKES A MAN PERFECT"- FRANCIS BACON.  
HOW CAN WE ACHIEVE THIS IN SLN WITH THE AIM OF BUILDING  
AN INTELLECTUALLY SOUND NAVY TO MEET THE GLOBAL  
STANDARDS**



Lieutenant Commander (MARINE) Sisira Kumara, psc

*"The more that you read, the more things you will know. The more that you learn, the more places you will go"*

*DR Seuss*

## **Introduction**

Reading is one of the most powerful tools which help to develop the human knowledge. It helps to keep the things in memory. Although it is a valuable habit, majority of people in society are very much reluctant to read than the use of visual aids. It has been identified that the reading habit is getting moderately downwards during past decade due to various reasons. Although Sri Lanka is having 92 percent of literacy, there is a reading deficiency in Sri Lanka. Wijesiri (2012) reports the culture of reading has been declining since ages. This was examined by (Iyengar, 2007) the reading habit is declined in both gender and in virtually all age groups. The decline is steepest in younger generation at a greater rate than in the general population in the world. It is proven fact that as the reading habit is getting down day by day, minds of the human become reprehensible and inhumane. SLN is experiencing many difficulties as we are not an intellectually sound navy to meet the global standards.

Nowadays the reading habit is getting important in the modern world. If the reading makes a man perfect, it is high time to inculcate a reading culture in Sri Lanka Navy with the aim of building an intellectually sound navy to meet the global standards. This brief account of facts are written in view of finding the reasons for the reluctance on reading and then to make recommendations to inculcate reading culture in Sri Lanka Navy in order to build an intellectually sound navy to meet the global standards.

## **Requirement of Promoting Reading Habits**

Otike(2011) explains, promotion of a reading culture aims to publicize reading among members of the general public. It is an activity that is meant to popularize reading and make it a lifelong hobby. The aim of promoting reading habits in SLN also is to make it a lifelong hobby of naval personnel in order to build an intellectually sound navy to meet the global standards in future. After established peace by defeating the terrorism from Sri Lankan soil, Sri Lankan Security Forces made a reputation for them in the world. Further, we have been facing different type of post-war challenges. In line with the technological and

theoretical development in the world, navy is also developing day by day. Apart from such security-related considerations, the role of the military in post-war Sri Lanka extends towards many other areas, due to the professionalism, training and expertise possessed by the Security Forces.

Sri Lanka Navy is heading towards a professional navy. Being an Island nation, as the naval force it is essential to coordinate with other countries to enhance maritime security. To build up good cooperation with them it is needed to enhance the knowledge of naval personnel. The reading is doing immense role to enhance our knowledge. Since reading makes a perfect man, by making them to read, we could create professional officers and sailors. Finally, we would be able to become a valuable and respectable navy in the world.

### **Existing Reading Culture of Sri Lanka Navy**

Currently most reading in the world is based on books, magazine, newspapers, notebooks, leaflets and electronic displays such as computers, television, mobile phones or e-readers. It is common in the navy. (Oke, 1996) gives reasons why people read, including self-improvement, pleasure and relaxation, and a feeling of pride and prestige, enjoyment, recreation and respect. Personnel in SLN also have same purposes for reading. Most of the habits are given by our parents, teachers, and friends as well. As per (weallcanread.com, no date), innate learning ability, home environment, parental environment and quality of schools attended etc, are the main factors which play a profound role in determining how well a person learns to read. This is applicable for naval personnel too.

Although, libraries are available in most of the ships and establishments. We can not satisfy with the reading facilities (except NMA library) that are available in the Sri Lanka Navy. Further, function of the libraries and quality and quantity of the library materials are also not in satisfactory level. Talukder (2017) explains quality and quantity of reading also a matter for the improving knowledge. Naval personnel who use the library facilities in SLN need adhere to the old rules and regulations of typical library. It has been illustrated in the news by (NFK EDITORS, 2019) 'Libraries are growing and changing. They have a lot more going on now than simply shelves and shelves of books. Every library is different, thus it's common now for libraries to also have music, videos, magazines, newspapers, e-books, audiobooks, games, and sometimes even video games. Many libraries also offer activities and clubs, usually based on the things that interest the people who visit the library. Therefore, it is necessary to change the environment and way of function the libraries. All in all, it can be concluded that existing facilities and arrangements for reading in SLN are not in satisfactory level to build an intellectually sound navy to meet the global standards.

## Causes for Reading Deficiency

There are many causes of creating reading deficiency in SLN. One of the main causes is, some of the rules and regulations which are implemented in order to maintain the library discipline affect to create reading deficiency in navy, as people mainly read for getting relaxation. They need to smoke, talk, laugh, and take calls whilst reading in the library. Further, they wish to have freedom to go to the library whatever the time that feasible for them, as well as to wear comfortable rig for them. Although they expect such freedom, there are some restrictions on them.

Another cause is, not using technology effectively. There are many sophisticated items available in the society. People can find reading articles relevant to any field, within no second. Everything is on their fingertips with the development of technology. However, majority of people do not use it effectively. It is common everywhere in the society. It is illustrated by Turbat (2016) the reading habit has been a great help in developing knowledge. However today when browsing the net, playing with mobile and passing non-stop SMS seem to be the order of the day. This is what really practiced by some of our officers and sailors.

Addicting to watching television also affects to decline reading habit. People spend more time watching TV programmes. It has been mentioned Turbat (2016) TV and films overload the minds of youth. We have to think about it seriously as to how the growing generation can find time to read. While technology is taking control steadily over individual lives, the reading habit is vanishing fast into thin air.

In addition to that, few other reasons to decline the reading culture are, inadequacy of library facilities, quality of books, non-availability of materials which are enjoyable and interesting, job environments, additional workload, poor time management, personal problems, insufficient language ability (specially English language) and stress condition of juniors due to less experiences and influences of seniors can be noted as examples.

Finally, lack of reading promoted environment in the SLN can be pointed out as another main reason. The pattern of naval training does not encourage reading. Most of the naval personnel mainly depend on the memorization of given notes for the subjects targeting the questions papers. They do not read more than their immediate needs, if they are not encouraged to read. Trainees depend on the lecturer/instructor as the only source of information. They have not realized that the 'further education' depends on quantity and quality of reading.

## Benefits of the Reading

One of the studies about reading by Nabuyanda(2011) revealed that 'reading is a very important aspect of the life which is not only about enjoy-

ment but a necessity; the basic tool of education. Reading is a key for each and every human being in order to deal with new and emerging knowledge in the changing world of technological advances. Reading therefore, has been said to be the most important operating area for public'. The habit of reading is the best pastime. It can keep a person busy, when he has nothing else to do. The persons who are in the habit of reading, not only make the best use of their spare time, even they will keep their minds away from the worries that might chase them if they sit brooding, doing nothing. A good book, for a reader, is better than visiting the best of gardens and scenic places.

Reading is a paramount important skill in finding a happy environment in the Navy, as it helps us to overcome stress, it makes us confident in our professionalism. When one is reading, one has to be thinking, predicting, questioning, evaluating defining and redefining. Through such processes reading improves the functioning of the brain, it is the best exercise that we can do for the proper functioning of our brain. For that there are many quality reading materials available in the world. If we are poor in reading, it would take more time to absorb and reacting the workplace. The habit of reading develops in our mind. Understanding the written word is one way, the mind grows in its ability. Reading helps us for communicating across cultures and national boundaries as well as social lines.

Reading helps readers to improve their vocabulary, spelling, and grammatical proficiency. Mart (2012) mentions that, those who read in a foreign language become well and more confident readers, they write better, their listening and speaking abilities improve, their vocabularies get richer. In addition, they develop positive attitudes toward and increase motivation to study the new language.' Being an Island nation as the naval force coordination with other countries is very much essential to enhance maritime security. Having sound knowledge in English and other foreign languages is a paramount important in order to communicate with other countries. In addition to that reading gives us the ability to stay happy anytime and anywhere and it helps to build up close friendships. We can develop our decision making skills. By reading we can learn cultural influences, relationships, history, human psychology and manners. Reading helps to fill minds from many sources. As a whole, the reading is doing immense role to enhance our knowledge.

## **Conclusion**

The literacy rate of Sri Lanka is 92 percent. That is the expected level of developed countries. Although we are representing a country that is having such literacy rate, we have failed to build an intellectually sound navy to meet the global standards. The habit of reading in the navy is not in a satisfactory level to achieve the goal. It is found that reading culture of officers and sailors has been decreased by various factors such as watching TV, addicted to Facebook, misuse

of sophisticated items such as smart phones, tabs, and computers, rules and regulation on library functioning, insufficient language skills, inadequate facilities, quality of books, job environments, poor time management, additional workload, personal problems and uncalculated pressure made by the superiors.

It is clear that promoting the reading culture in SLN is a timely requirement to build an intellectually sound navy to meet the global standards, so that naval personnel may mentally fit enough to perform tasks that are assigned to them in professional and outstanding manner. There is a need to reduce the naval personnel's dependence on the lecturer/instructor as the only source of information. Promoting a reading culture in the SLN is not an easy task, as most of them have not practiced it as a hobby since their childhood. However, it could be done after educating them of the benefits of reading. We all have to realize it and work together to achieve this goal.

The habit of reading can be commenced at any age. The habit of reading can keep a person busy and it is the best way to pastime. The persons who are in the habit of reading, not only make the best use of their spare time, although they will keep their minds away from unnecessary thoughts. Reading helps us to discharge our duties in short and sweet manner, without wasting our time. Further it makes us better understanding of others communication and it develops our mind. It helps to enhance our knowledge. We all should contribute to make a very high reading culture in the navy. Once naval personnel make a reading a habit, the demand for books will grow and the members of the university at sea will become an intellectually sound navy to meet the global standards.

## **Recommendations**

It has been proved in several occasions that we are not intellectually sound enough to meet the global standards. Therefore, following recommendations can be implemented with the aim of building an intellectually sound navy to meet the global standards.

- a. **Conducting Awareness Programmes.** It is recommended to conduct awareness Programmes for naval personnel who addicted for watching TV and Facebook, misuse of sophisticated items such as smart phones, tabs, and computers, web sites and technology in order to make suse of them effectively.
- b. **Separate Libraries for Officers, Senior Sailors and Junior Saiors.** At present all naval bases have a separate bar for officers, senior sailors and Naval Institutes for junior sailors. In such a way a separate library could be established for officers and senior sailors at wardroom and senior sailors mess respectively, for Junior sailor's a, library could be established in

a suitable nook in their premises. It is highly recommended to function these libraries deviating from the typical rules and regulations that are related to a general library. No need to be silent, they can have music, simple dress code, etc. Further, it is recommended to provide some facilities (during stay at library) such as availability of refreshment, conduct games using library materials.

c. **Develop library services.** It is necessary to attach a trained librarian for each library and to maintain the required quantity and quality stock of library materials. Need to ensure the proper function of library (maintain registers, adhering to library hours etc).

d. **Responsibility of divisional Officers** Divisional officer should be a reading role model and encourage their subordinates for reading. The divisional officer may direct their subordinates to read at least one or two books before applying leave. It is the responsibility of divisional officer to give the list of recommended books and grant the leave after verifying the information of reading.

e. **Introduce DEAR method to office.** The stand for DEAR is Drop Everything And Read. This method is implemented by developed countries for promoting reading culture. It is up to HOD/CO/OI to decide what time and how to announce the DEAR time. When we hear the word 'DEAR' it is necessary to stop what they are doing and start reading for half an hour. Whatever the reading that is done during the DEAR time not be tested, only for pleasure.

f. **Introducing a question paper based on allocated library periods.** As per the training syllabuses, considerable number of library periods are allocated for most of the courses. But it is not measured that whether it is used effectively or not. Recommend to give a list of recommended books for under trainees to read during library periods. At end of the course, a questions paper to be given based on information of the recommended books. The list of the books to be varied from course to course.

g. **Introducing a general knowledge testing question paper.** It is proposed to introduce a general knowledge testing question paper for senior and junior sailors prior to their advancement and make it compulsory to pass in order to get eligible for the advancement (Like PET).

h. **Introducing to award a "Best Reader of the Course" trophy.** Recommend to introduce a trophy for "Best Reader of the Course". The commandants of respective training bases are to prepare a suitable



selection criteria to find the 'Best Reader of the Course' for each course.

*"A reader lives a thousand lives before he dies. The man who never reads lives only one."*

*George R.R. Martin*

## REFERENCES

Iyengar, S. (2007) 'To read or not to read: a question of national consequence', National Endowment for the Arts, 25, pp. 1177–1178. Available at: <http://arts.gov/sites/default/files/ToRead.pdf>.

Mart, C. T. (2012) 'Developing Speaking Skills through Reading', International Journal of English Linguistics, 2(6). doi: 10.5539/ijel.v2n6p91.

Nabuyanda, M. M. (2011) 'Factors Inhibiting Promotion of a Reading Culture : A Study of Basic School Libraries in Lusaka'.

NFK EDITORS (2019) A Day for Beverly Cleary, D.E.A.R., and Libraries. Available at: <https://newsforkids.net/articles/2019/04/12/a-day-for-beverly-cleary-dear-and-libraries/>.

Oke, E. (1996) 'An Analysis of progress made by public libraries as social institutions in Nigeria', Library journal. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000057553> (Accessed: 11 August 2020).

Otikey, F. W. (2011) 'Reading culture , cultivation and its promotion among pupils : a Kenyan perspective', Reading, 1(August), pp. 1–5.

Talukder, A. A. (2017) 'The Reasons for the Poor Reading Skills of the Students on Entry to the Tertiary Level of Education in Bangladesh The Reasons for the Poor Reading Skills of the Students on Entry to the Tertiary Level of Education in Bangladesh', (August).

Turbat (2016) MINDS 2016 Annual Youth Dialogue – MINDS. Available at: <https://minds-africa.org/minds-2016-annual-youth-dialogue/> (Accessed: 11 August 2020).

weallcanread.com (no date) The Cause of Poor Reading Skills, weallcanread.com. Available at: <https://weallcanread.com/the-cause-of-poor-reading-skills/> (Accessed: 11 August 2020).

server. Available at: <http://archives.sundayobserver.lk/2012/10/14/imp01.asp> (Accessed: 2 August 2020).





