

CADL NEWS LETTER

Centre for Aerospace and Defence Laws

December 2021

Webinar Issue



**Aerospace and Defence Law Lecture Series - 2020
&**

**Scope and Opportunities in Aviation, Space, Defence, Maritime,
GIS and Remote Sensing Sectors - 2021**



Centre for Aerospace and Defence Laws (CADL)
NALSAR University of Law , Hyderabad

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Message from Vice-Chancellor

Since its inception, NALSAR University of Law, Hyderabad is known for its research-based teaching and publications. With its core objective of promotion of excellence in legal academics and research in contemporary legal issues, the University has developed various Centres of Excellence involved in the work in specialized areas of Law and Social Sciences. To promote the research and teaching activities in the area of aerospace and defence laws, NALSAR has established a Centre for Aerospace and Defence Laws (CADL).

According to the International Air Transport Association (IATA), the Indian Aviation Industry is expected to overtake China and the United States as the world's third-largest air passenger market in the next ten years, i.e. by 2030.

India's passenger traffic stood at 115.37 million in FY21. Owing to COVID-19-related restrictions on flights in FY21, Domestic passenger and international passenger traffic declined at a CAGR of -9.02% and -28.64%, respectively, from FY16 to FY21. In FY21, airports in India pegged the domestic passenger traffic to be ~105.2 million, a 61.7% YoY decline, and international passenger traffic to be ~10.1 million, an 84.8% YoY decline, over the fiscal year ended March 31, 2020. In September 2021, the average daily domestic passenger flight departures stood at 2,100.

To cater to the rising air traffic, the Government of India has been working towards increasing the number of airports. As of 2020, India had 153 operational airports. India has envisaged increasing the number of operational airports to 190-200 by FY40.

Further, the rising demand in the sector has pushed the number of airplanes operating in the sector. The number of airplanes is expected to reach 1,100 planes by 2027.

With India's boundary disputes from the neighbouring countries and China's strategy to increase its presence in the world, there is a need for a strong security strategy. This marks India's defence industry as a crucial sector from a strategic standpoint. The Indian military's entire budget for the fiscal year 2019 was \$60.9 billion, while the budget for the fiscal year 2020-21 is US\$65.86 billion, an increase of little under 7%. India has been seeking for increased indigenisation of military hardware because it imports over 70% (by value) of its high-tech defensive hardware from Russia, Japan, Israel, and the United States. This Indigenisation of the defence sector has increased the opportunities for Indian human resources.



Prof. (Dr.) Faizan Mustafa
Vice Chancellor

With outer space becoming less of an abstract notion and more of a cultural reality, commercialization and privatization have become the order of the day. In order for commercial space activities to grow, there must be an attractive legal environment to enable operating companies to plan and manage passenger services, not to forget the legal issues and challenges in commercial mining of outer space, celestial bodies, asteroids.

With this being said, I am pleased that the Centre for Aerospace and Defence Laws (CADL) has organized the webinar series on "Aerospace and Defence laws Lecture series" in 2020 and another series on "Scope and Opportunities in Aviation, Space, Defence, Maritime, GIS and Remote Sensing Sectors" in 2021. I personally felt the great need and relevance of having these webinars as the interaction between the industry and academia brings forth the opportunities available in the sectors nationally and internationally. These webinars helped the freshers and even the employees to know the opportunities available in the sectors.

I am glad that the Centre for Aerospace and Defence Laws (CADL) has taken the initiative to organize these webinars. I am happy to see the tremendous response to these webinars. With this, I put into the hands of our readers the Special Edition of CADL Webinar series Newsletter, 2021.

Message from Centre Director

It has given me an immense pleasure to be able to host the webinar series on “Aerospace and Defence laws Lecture series” in 2020 and another series on “Scope and Opportunities in Aviation, Space, Defence, Maritime, GIS and Remote Sensing Sectors” in 2021 as the Director of the Centre for Aerospace and Defence Laws (CADL). The Centre is committed to the cause for promoting legal awareness in Air, Space, defence, Maritime and GIS and Remote Sensing sectors not only in India but also abroad. These areas of law are contemporary, emerging and evolving. Hence the legal, policy and regulatory aspects are to be determined and examined.

In this endeavour, the Centre for Air and Space Law (CASL) was established by the NALSAR University of Law in 2005 and from then, the Centre is active teaching and research activities. Recently CASL is upgraded to Centre for Aerospace and Defence Laws (CADL) to enhance the Research and Development in Air, Space, Defence, Maritime and GIS & Remote Sensing sectors and also provide assistance to Governmental institutions/ organizations and private institutions and spread awareness in aerospace and defence laws through various activities including providing internship opportunities, moot courts, conferences, publications etc.

CADL has the mission to contribute to the growth of Air, Space, Maritime and Defence Laws in domestic and international arena and help in extending the frontiers of these Laws, to play a pivotal role in spreading the importance of aerospace and Defence laws in the 21st Century, to promote the study and research of law relating to Aerospace and Defence Laws and to encourage students to gain expertise in these areas, to undertake Policy research and advise the Governments both in India and abroad in the realm of fast growing law of Aerospace, Defence and Security Regimes, to promote collaborative research in Aerospace and Defence projects having national and global importance, to render consultancy services to stakeholders for resolving all issues arising out of Aerospace and defence sector to, to disseminate the knowledge of Aerospace and Defence laws through high quality publications, pioneering research work, offering Courses etc., to become world reputed repository of knowledge in the field of aerospace and Defence laws and to create value for all the stake holders and make a difference.

Through Centre we offer various regular and elective courses to LL.B and LL.M students at NALSAR University of Law and we provide M.A. and Advanced Diploma courses in Aviation Law and Air Transport Management, Security & Defence Laws, Space and Telecommunication Laws, Maritime Laws, GIS and Remote Sensing Laws through Distance and on-line



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Professor of Law, Registrar and
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mode to the working professionals and fresh graduates. To meet the mission of the Centre, we also publish Indian Journal of Air and Space Law (IJASL) biannually with the selected articles and papers by students, Academicians, Industry experts and other personalities who are interested in the areas of Air and Space Law. 2021 marks the inaugural year for the first edition of “Indian Journal of Defence and Maritime Laws” (IJDML). IJDML is a peer-reviewed biannual journal with selected articles from students, academicians, Industry experts. We have also conducted various moot courts, competitions, conferences, workshops, seminars in Air, Space, maritime and Defence Laws in the same regards.

The need of the hour in the world is to think from competition to cooperation towards the betterment of humanity. Extensive research in defence, space and technology clubbed with legal parameters will be beneficial for humankind. This gives us path-breaking success on cross-cultural management in global aerospace exploration and commercialization. In the wake of technological advancements in aviation, defence and space industry both, a comprehensive framework is mandated so as to bridge the gap between industry and academia. Enabling this will help create a congenial environment favourable for business to bloom.

In the light of above and mission, vision and objective of the Centre, We had organized this webinar series on scope, opportunities and need for education.

I thank the distinguished guests, speakers, organizers, participants and the enthusiastic research scholars, for taking an active part in the webinar series.

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ABOUT CENTRE FOR AEROSPACE AND DEFENCE LAWS (CADL)

NALSAR established the Centre for Aerospace and Defence Laws (CADL) in 2005 with the objective of promoting the development of aviation, space, maritime and defence laws and policies. Since then, NALSAR-CADL has been promoting the study of Aerospace and Defence Laws by introducing courses, conducting National and International Conferences, Moot Courts, Workshops and also publishing Newsletters, Journals, Books and Articles, besides awarding a few M.Phils. and Ph.Ds. in the said areas. The objective of introducing these unique and value added courses is to cater to the needs of unprecedented aviation growth coupled with commercialization and privatization of aerospace, defence and maritime industries, which calls for thousands of skilled manpower to meet not only managerial requirements but also legal compliances that arise from the high value transactions.

Vision Statement

To be the world's renowned Centre of excellence in the field of Aerospace and Defence Laws, research and education.

Mission Statement

NALSAR University of Law through CADL has envisaged the mission to -

- Contribute to the growth of Air, Space, Maritime and Defence Laws in domestic and international arena and help in extending the frontiers of these Laws.
- To play a pivotal role in spreading the importance of aerospace, Defence and Maritime laws in the 21st Century.
- To promote the study and research of law relating to Aerospace, Defence and Maritime Laws and to encourage students to gain expertise in these areas.
- To undertake Policy research and advise the Governments both in India and abroad in the realm of fast growing law of Aerospace, Maritime, Defence and Security Regimes.

- To promote collaborative research in Aerospace, Defence and Maritime projects having national and global importance.
- To render consultancy services to stakeholders for resolving all issues arising out of the Aerospace, defence and maritime sector.
- To disseminate the knowledge of Aerospace, Defence and Maritime laws through high quality publications, pioneering research work, offering Courses etc.
- To become a world reputed repository of knowledge in the field of aerospace and Defence laws.
- To create value for all the stakeholders and make a difference.

Objectives of CADL

- To provide assistance to Government institutions/organizations and private institutions and industries on all legal aspects relating to Air, Space, maritime, Security and Defence.
- To produce well researched expertise on various kinds of issues in the Aerospace and Defence arena.
- To enhance Research and Publications in the realm of Aerospace, defence, and maritime Laws.
- To arrange and offer internship programs to trainees from Aviation, Space, Defence and Maritime Research Centres.
- To spread awareness programs on Aerospace, Defence and Maritime Laws education throughout India and abroad.

Pursuant to achieving the coveted objectives, CADL, NALSAR has been continually promoting teaching and research in the field of Aerospace and Defence Laws for more than a decade and half. CADL organized several national and international conferences, workshops, moot courts, publishing books, journals, newsletters etc. to disseminate the significance and importance of Aerospace, Defence and Maritime Laws.

TEACHING- LL.B., LL.M., AND INTRODUCTION OF NEW COURSES

The Centre for Aerospace and Defence Laws (CADL), NALSAR University of Law has always pioneered in teaching and research in advanced areas. CADL offers various elective/seminar courses for LL.B., LL.M. students including Contemporary Issues in Air and Space Law, Defence Procurement Policy, Public Private Partnership in Aviation Industry, Aerospace and Defence Start-ups etc. These Courses are being offered by the Centre for the past 20 years and produced a number of scholars. Many students with degrees in air and space law have now been absorbed in the national mainstream and are working with the airlines, airports, law firms, multinational corporations etc. Several of them have also taken up important assignments abroad, enriching global prospects.

For Regular Students: Every Year we have been offering regular courses on Air and Space Laws, aerospace and defence start-ups, defence policies in India etc to LL.B and LL.M students at NALSAR University of Law. To date, more than 80 Students had opted for this Courses and attained immense knowledge in the Air, Space and Defence Laws. There are also few Ph.D Scholars who pursued in Air and Space Laws and Defence Laws.

Distance and on-line Mode: NALSAR University of Law on 1st December, 2008 signed an MOU with Institute of Applied Aviation Management (IAAM), Calicut, to offer one year Post Graduate Diploma course in Aviation Law and Air Transport Management (PGDALATM) with the motive to meet the aspirations of students / individuals pursuing ENGG / MBA / LAW / Aviation-Related courses and serving aviation executives by giving them simultaneously a value added qualification without jeopardizing their current pursuits and the course were commenced in March 2009.

NALSAR University of Law in collaboration with Institute of Applied Aviation Management (IAAM), Calicut introduced a one year 'Post Graduate Diploma in Aviation Law and Air Transport Management' which was inaugurated by Hon'ble Mr. Justice L. Narasimha Reddy, Judge, High Court of A.P. on 21 May 2009 at NALSAR Campus. While launching the programme, he emphasized the importance of aviation education and congratulated NALSAR-IAAM for their unique initiative. It is the first ever academic industry partnership which is

a remarkable initiative particularly for the aviation industry.

In terms of the MoU signed between NALSAR University of Law and Institute of Applied Aviation Management (IAAM), Calicut, the first Post-graduate Diploma Course in Aviation Law and Air Transport Management (PGDALATM) was launched at Cochin on 23rd April, 2009, at Hyderabad on 21st May, 2009 and at Bangalore on 23rd July, 2009. Total 115 students admitted to the programme out of which 25 students were admitted at Cochin, 60 students at Hyderabad and 30 students at Bangalore.

Out of a total of 115 candidates admitted during 2009 – 2010, 102 candidates were found eligible for award of the P.G. Diploma in Aviation Law and Air Transport Management. The Diploma Award Ceremony was held on September 2, 2010 at NALSAR Campus. Shri. G.M. Rao, Group Chairman, GMR Group was the Chief Guest and awarded Diploma Certificates. Capt. S.N. Reddy and Dr. Padmini Reddy Gold Medal and Asian Institute of Transport Development Gold Medal were awarded to the Topper and Second Topper respectively at the function.

During 2010-2011, admissions for the second batch of PGDALATM were made and a total of 191 candidates were admitted. The onsite classes were conducted at Bangalore, Cochin, Delhi, Hyderabad and Kolkata.

NALSAR- IAAM signed an MOU with Government of Sharjah, Department of Civil Aviation and launched the first ever unique Aviation Law and Air Transport Management program in the UAE in May 2010. With a view to enhance the quality and reach of air and space law studies across the world, the Centre had launched the first ever Post Graduate Diploma in Aviation Law and Air Transport Management (PGDALATM) in Sharjah (UAE) 2010-2011 and successfully conducted the One year PG diploma in Air Law and Air transport Management at Bangalore, Cochin, Calcutta, Delhi, Hyderabad and Sharjah, Dubai.

During 2011, the admissions to the 3rd Batch Post-Graduate Diploma in Aviation Law and Air Transport Management (PGDALATM) were made and a total of 132 students were admitted. The contact classes were conducted at Hyderabad, Bangalore, Mumbai, New Delhi Centres.

LAUNCH OF INNOVATIVE COURSES

With the concept of “Aerospace, Defence and Maritime Education at door steps of Needy Students with affordable costs”, NALSAR through CADL has also launched a few innovative on-site and online courses. In the year 2013, CADL, NALSAR has also started innovative 'online-onsite' courses such as Master's Degree in Aviation Law and Air Transport Management (MALATM); Master's Degree in Space and Telecommunication Laws (MSTL); One-year PG Diplomas in Aviation Law and Air Transport Management (PGDALATM); One-year PG Diploma in GIS and Remote Sensing Laws (PGDGRSL) under the aegis of Centre for Air & Space Law. The objectives of these courses are to cater to the needs of the unprecedented growth in the aviation sector coupled with the commercialization of space technologies that has created the need for thousands of skilled manpower to meet the requirements of the rapidly growing aerospace and telecommunications sectors. In view of 2G controversy, there is an urgent need to have specialisation in the upcoming discipline of telecommunication laws. The Centre also undertook collaborative research activities in areas of common concern with State Governments; Multinational Corporations such as the GMR group, Non-Government Organizations and other International Organizations. The enrolled students in the year 2013 for the One Year Post-Graduate Diploma in Aviation Law and Air Transport Management, 25 students have successfully completed their course and the Diplomas were awarded in the Twelfth Annual Convocation held on August 2, 2014.

During 2014, CADL, NALSAR, started a Centre at New Delhi for conducting the onsite sessions for the 2-Year Master's Degree in Aviation Law and Air Transport Management and One Year Post-Graduate Diploma in Aviation Law and Air Transport Management in order to accommodate the growing demand and having regards to the needs of the working professionals from New Delhi. During the year, 74 candidates were admitted to Master's Degree in Aviation Law and Air Transport Management; 08 candidates were admitted to Master's Degree in Space and Telecommunication Laws; 13 candidates were admitted to PG Diploma in Aviation Law and Air Transport Management.

During the year 2015, 88 candidates were admitted to Master's Degree in Aviation Law and Air Transport Management (Delhi & Hyderabad Centres); 10 candidates were admitted to Master's Degree in Space and Telecommunication Laws (Hyderabad Centre). Onsite sessions were conducted at Delhi and Hyderabad Centres and examinations were conducted both at Hyderabad and Delhi Centres. 19 students have become eligible for award of Master's Degree in Aviation Law and Air Transport Management; 04 students of Master's Degree in Space and Telecommunication Laws; 07 students of Post-Graduate Diploma in Aviation Law and Air Transport Management.

Ms. Sadaf Amrin Fathima, student of Master's Degree in Space and Telecommunication Laws (2015) has been awarded the prestigious 'DAAD Scholarship' for pursuing Master's Programme in the University of Munich, Germany.

In 2017, the Centre for Air and Space Law (CASL) was changed to the Centre for Aerospace and Defence Laws (CADL) to expand its research in the area of Defence Laws also.

During 2018, CADL offered M.A. (Aviation Law and Air Transport Management) and P.G. Diploma in Aviation Law and Air Transport Management courses through Directorate of Distance Education. The Centre also offered a Certificate Programme on Advanced Air Laws during February 8 – 12, 2018. The programme was offered at NALSAR as a residential programme and a total of 24 candidates registered for the programme and the certificates were awarded to the successful candidates.

During the academic years of 2019-2020, 2020-2021, more than 400 students have enrolled in the M.A and Diploma programmes offered by the Centre. As per the new National Education Policy and UGC guidelines, P.G. Diploma has been renamed to Advanced Diploma. In view of the National Education Policy, 2020, a provision has been made for Lateral Admission in the Second Year MA Programme offered in the relevant specialisation for the candidates enrolled for the One Year Advanced Diploma programmes. Further as per NEP 2020, 'EXIT' option is also available for the candidates enrolled for M.A. programmes. If a candidate

opts to EXIT after completion of the FIRST YEAR, she / he would be awarded Advanced Diploma Certificate in the said specialisation.

Brief background about Masters and Diploma Courses

The objective of introducing these unique courses is to cater to the needs of unprecedented aviation growth coupled with commercialization of telecom & space technologies, which requires a large and highly skilled workforce to meet not just the managerial requirements of the rapidly growing aerospace industry but also the legal complications that arise from the high value transactions involving the market participants. These courses seek to meet the burgeoning demand of the industry from the supply-side by producing legal and managerial aerospace experts which India is facing an acute shortage. NALSAR's initiative crystallize an academic – industry partnership in the domain of Air Transport Management, Aviation, Maritime, Defence, Space, Remote Sensing, GIS and Telecom Laws which makes the programme first of its kind not only in India but also in this part of the world. The aforesaid courses are unique value-added qualifications which would help the aspirants to acquire global placements in aerospace and telecom industries.

The uniqueness of the programme: The curriculum of the programme is a tailor-made to meet the professional needs of the aviation industry-airport, airline, aerospace, Defence, Maritime, Telecommunications, GIS and Remote Sensing and other related sectors so that the products are in a position to directly take on the core managerial positions in any of these sectors. A lawyer who has been traditionally endowed with rational mind can now be seen as a 'Professional Manager' because of the specialization, sector specific knowledge and competence in the industry that he/she receives during the program. Similarly, a manager who is endowed with analytical ability is now in a position to function at a higher lever with a greater competence by acquiring the specific knowledge of the rules of the game i.e. Aviation or Defence or Space Laws. This unique advantage of a comprehensive understanding of the industry is its operational aspects, managerial functions, legal aspects and of the general management interlined with the Industry specific modules. Thus it provides a

comprehensive understanding of the industry with the practical exposure.

Conduct of the Programme: Master's Degree and Advanced Diplomas are of 'Blended version' (a mix of Onsite and Online) sessions spread across four and two semesters respectively. Each semester will have Onsite intense session by the subject experts, followed by Online session where participants will work on the case studies/project assignments and upload them on the dedicated web portal. Under the mode of intense e-learning process, the students can have access to subject experts specializing in various areas of the subject. The relevant updated materials will be uploaded from time to time. At the end of the final semester for M.A. Programme, students are required to submit a Dissertation.

United Nations Recognition for Air and Space Law courses offered by CADL, NALSAR

CADL's (earlier known as Centre for Air and Space Law (CASL) innovative courses on Space and Telecommunication Laws have been recognised by the United Nations Organization Office for Outer Space Affairs (UNOOSA), Vienna in its updated Directory on Education Opportunities in Space Law (A/AC/105 /C.2/2015/CRP.9). This Education Directory by UNOOSA recognizes and showcases the innovative education opportunities in Aerospace Industry available across the world. These courses offered by Centre for Aerospace and Defence Laws (CADL), NALSAR are a unique combination of Law, Management and Technology in the field of aerospace.

Following are the Masters and Diploma Courses:

1. Two-Year M.A. (Aviation Law & Air Transport Management)
2. Two-Year M.A. (Security & Defence Laws)
3. Two-Year M.A. (Space and Telecommunications Law)
4. Two-Year M.A. (Maritime Laws)
5. One-Year Advanced Diploma in Aviation Law & Air Transport Management
6. One Year Advanced Diploma in Maritime Laws
7. One-Year Advanced Diploma in GIS and Remote Sensing Laws

Courses from the Centre

TWO-YEAR M.A. (AVIATION LAW & AIR TRANSPORT MANAGEMENT)

The aviation industry has always been a very unique industry in itself. Its rapid growth across the globe coupled with usage of the best and the most innovative technologies and increasing contribution to the economic and infrastructural development of a country makes the international civil aviation sector particularly important from both legal as well as management perspective. Legal and Management aspects of International Civil Aviation are so well interconnected that the study of one aspect is incomplete without the study of the other. Thus NALSAR through its Centre for Aerospace & Defence Laws (CADL) proposes to introduce 2-Year M.A. (Aviation Law & Air Transport Management) programme.

Through this programme NALSAR aims to create an industry of aviation lawyers catering and specializing in both legal and management aspects of international aviation law. The course participants would not only have a sound and strong foundation on legal and management patterns of international civil aviation sector but also will be well-equipped to handle practical and contemporary aspects and challenges faced in the daily governance of the aviation industry. The unique advantage of this programme is the comprehensive understanding of the aviation industry which would include its operational aspects, legal management and technical knowledge with a special focus on catering to the contemporary requirements of the growing aerospace industry.

The programme also aims to meet the needs of personnel currently involved in the aviation industry, students of aviation and aviation enthusiasts who wish to upgrade their skills at tertiary level in the field of management in air transportation and application of aviation law. In addition, the program is designed to have considerable application for personnel in related technologically based service and business industries.

This programme is a unique blend of law and management subjects, giving the candidate a broad career prospect in the industry. The course is a two-year programme consisting of 12 subjects, stretched in to four semesters. The syllabus include General Principles of Law, International Air Law, Principles of Management,

Airport Management, Airline Management, Domestic Air Laws in India, Aviation Safety, Security and Liability Laws, Air Space and Air Transport Management, Aviation Marketing, Aviation Economics, Aviation Corporate Laws, and Aviation Contracts and Tenders. Apart from this, the candidates in the last semester are required to submit a dissertation on a topic selected by them in the concerned area, along with a field-work report for the partial fulfillment of the requirements for the degree in M.A. (Aviation Law and Air Transport Management).

TWO-YEAR M.A. (SECURITY & DEFENCE LAWS)

Defence studies, War studies, Strategic studies as currently taught only in a handful of Universities in India. Teaching and research activities are done in many universities of India, having as its primary focus on India's national security. In all departments of Defence studies the approach to the study of national security is interdisciplinary encompassing disciplines like Geopolitics and Military Geography, Science and Technology, Economics of Defence, Conflict Management and Conflict Resolution. However the above universities / institutions despite their commendable efforts are unable to provide a wholesome education and knowledge having due regards to the international legal framework, world politics and contemporary practices. NALSAR is the only University offering such a diverse course on defence and security studies from a legal perspective.

M.A. (Security & Defence Laws) intends to equip the course participants with national and international legal framework governing the defence and security industry in the global, regional and Indian context. The course would further train the participants in developing a strong foundation in management and governance of the defence sector by drawing from experiences across the globe and comparing the same in Indian context. National defence is not only the responsibility of the armed forces but it is a responsibility of all the citizens of a nation. The aim of the defence studies is closely related to other spheres of life. Hence, the course will focus not only defence personnel of the country but will attract numerous scholars across the globe who is engaged in research related activities in defence and strategic studies.

Recent move towards liberalisation and privatisation of defence industry also demands for a programme of this kind. With an objective of bridging the gap between Law and defence studies, the University intends to offer this Course through its Centre for Aerospace & Defence Laws (CADL).

The programme will be particularly beneficial for Serving members of the armed forces, policy makers and stakeholders working in the government departments, defence public sector undertakings, negotiators and diplomats who represent the country in the negotiations for various defence procurements, Aerospace Engineers/Students pursuing Aerospace Engineering, Law Graduates desiring specialization in defence Law, M.B.A students and Graduates undergoing various defence and strategic studies related Programmes. Hyderabad being hub of aerospace and defence sector, large number of defence professional working in this area needs upgradation of their skills towards legal and policy issues.

Also, there is a high demand for law professionals with expertise in security and defence laws. With the help of this programme, the candidates can be well placed for roles in international institutions, government department (ministries of foreign affairs, defence, justice, home affairs and development), non-governmental organisations, law firms and also in private sectors (defence and security companies).

The course is a two-year programme consisting of 12 subjects, stretched in to four semesters. The syllabus include General Principles of Law, International Security, Diplomacy and Conflict Resolution, Defence Technology and Law, International Institutions and Global Security, Defence Management and Strategic studies, Defence Contracts and Tenders, Defence Procurement Policies, Regional Security, Terrorism and Counter-Terrorism, Aviation, Space, Maritime and Cyber Security Laws. Apart from this, the candidates in the last semester are required to submit a dissertation on a topic selected by them in the concerned area, along with a field-work report for the partial fulfilment of the requirements for the degree in M.A. (Security and Defence Laws).

TWO-YEAR M.A. (SPACE AND TELECOMMUNICATIONS LAW)

Telecommunications is an infrastructure in which rapid technological advance has been occurring and the risk of obsolesce is comparatively higher than other infrastructural sectors. Telecommunications is also one of the few infrastructure sectors, where facility is never really completed as the telecommunications network that is established has to be either constantly expanded to achieve higher consumer penetration or has to be constantly upgraded to allow the network to provide the latest services possible. This growth and need in the industry demands skilled experts with superlative Legal knowledge.

The increasing number of Countries involved in space activities has emphasized the need for effective laws and policies on space activities not just on an international level, but also on the national level. The successful operation of space law, policies and institutions in a country relies on the presence of suitable professionals. With the more innovation in technology and need for new and advanced techniques require the blend of various skills to succeed in the field.

The combination of Telecommunication and Space Law is such a unique blend which enables one to meet the needs of rapidly expanding industry. To meet the need and to enable the research and study in Space and Telecommunications Law, NALSAR University of Law through its Centre for Aerospace and Defence Laws (CADL), had initiated to offer Course in this area. Through this programme NALSAR University seeks to address the need and promotion of legal shortcomings in the space and telecommunications Laws.

This idiosyncratic Course enables the learner to gain an understanding in both Space and Telecommunications Law. The curriculum of the programme includes the General Principles of Law, International Space Law, telecommunication Laws both International and national, Technology and its relation to Space and Telecommunications, IPR Issues in Space and Telecommunication technology, commercialization and issues relating to the Cyberspace and security threats, laws relating to remote sensing and geospatial data and also contemporary issues in space and

telecommunication sector. This amalgamation of the subjects enables a non-legal person to understand the laws and a non-technical person know the technicality.

This programme is suitable for those interested in the legal, space and telecommunication industry. One can make career prospects in the ministry or a space or telecommunication agency if he/she wishes to work for the government. One can also work with the space or telecommunication industry in a commercial space or telecommunication company or at a law firm which specializes in space or telecommunication law. If one prefers academia, working at a university or a research institute is also a good option.

TWO-YEAR M.A. (MARITIME LAWS)

India has a rich history in dealing with sea trade as well as a variety of trading and non-trading practices via sea within and beyond the confines of the country. Hence it has built up a magnificent maritime history and traditions for several decades even much before the rise of European maritime powers. However, it experienced decline while the western and European nations advanced during the Industrial Revolution.

At present, among all Asian and African countries, India has one of the largest and considerably well-coordinated merchant shipping fleet with almost ninety percent of the country's trade volume moved by sea. With one of the largest coastline and having boundary as sea/ocean, guarding the country through coast also gains importance.

In short trade and security through the ocean is prominent in India. Hence from past decades we have laws governing trade and security but with change in circumstances, updation and research on emerging areas is required. With the advancement in trade and increase in crimes on seas and natural disasters, there are various issues which need to be addressed. To name few, issues relating to insurance, liability, accidents, pirates etc., are common. With globalization and Technology-trade prominent era, new areas of concerns has emerged, like ship financing, maritime liens, carriage of goods by sea, ownership and registration of ships, ship sales and building contracts, limitation of liability contracts, law of collision, salvage, towage and pilotage and its related claims, law of marine pollution –

its consequences and liabilities, customs and port laws are few of them.

That being highlighted in the area of trade related, there are also new issues and emerging areas in security related. With the issues of pirates, laws relating to the rights and ownerships for the resources on the high seas and markings of Exclusive economic Zones, Laws related to the passageways of various varieties/registered ships, trespass of territorial waters, aid by the naval and coast guard forces, Technology used by these forces, rescue operations, access to ports, Laws relating to accidents/attacks on territorial waters, disputes settlement mechanisms for the armed forces, Strategies relating to the security on the seas etc gained prominence and require intense research and analysis of the same.

With the emergence of new areas and concepts in maritime field, the requirement for research and analysis is significant. Hence, this course aims to educate in these new emerging areas.

This program is suitable for those in both the legal and maritime industry who are looking to enhance their career prospects. It provides highly specialised knowledge and research skills relevant both to legal practitioners and to those operating more generally within the legal environment of the maritime sector. It would also assist anyone working in professions concerned with international trade and the maritime environment depending on the chosen line of speciality within the research framework.

It is mainly addressed to lawyers, legal advisers, judges and legal draftsmen. The program is also open to law graduates of any country who intend to pursue a legal career in the field of maritime law whether in the public or private sectors, whether in practice, administration or academia.

ONE-YEAR ADVANCED DIPLOMA IN AVIATION LAW & AIR TRANSPORT MANAGEMENT

The aviation industry has always been a very unique industry in itself. Its rapid growth across the globe coupled with usage of the best and the most innovative technologies and increasing contribution to the economic and infrastructural development of a country

makes the international aviation sector particularly important from both legal as well as management perspective.

Through this programme NALSAR aims to cater to the growing needs of the aviation industry and caters to impart knowledge and train the participants in the legal as well as management aspect.

The curriculum of the programme is a tailor-made to meet the professional needs of the aviation industry which includes airport, airline, aerospace and related sectors so that the trained professionals are in a position to directly take on the core legal-cum-managerial positions in any of these sectors. A lawyer who is traditionally been endowed with rational mind can perform the multiple role in the form of an aviation professional who can serve in the capacities of aviation lawyer, manager and technical support. Similarly, a manager who is endowed with analytical ability is now in a position to function at a higher level with greater competence by acquiring the specific knowledge of the rules of the game – Aviation Law.

The unique advantage of the above programme is the comprehensive understanding of the aviation industry which would include its operational aspects, legal management and technical knowledge with a special focus on catering to the contemporary requirements of the aerospace industry.

This programme is a unique blend of law and management subjects, giving the candidates a broad career prospect in the industry. The course is a one-year programme consisting of 6 subjects, stretched in to two semesters. The syllabus includes General Principles of Law, International Air Law, Principles of Management, Airport Management, Airline Management, and Domestic Air Laws in India.

ONE YEAR ADVANCED DIPLOMA IN MARITIME LAWS

The programme is the initiative of Centre for Aerospace & Defence Laws (CADL) of NALSAR University towards providing a comprehensive legal education thereby enabling the learner to develop an advanced understanding of a specialized area of maritime law and promote research in the area of maritime laws as there

are very few universities in the country that are engaged in conducting teaching and research in the discipline of maritime laws. India is rapidly integrating its economy with more than 90% of the country's trade being conducted through oceans and also the sea provides passageway to 45,000 merchant ships worldwide and over 90 percent of global trade. Hence, there is an urgent need to strengthen and popularize maritime legal education in India. There is a growing need for students specialized in laws of sea. Shipping legal firms handling corporate shipping, insurance and port management are seriously looking for young and talented students trained in the legal regime of international and national maritime sector.

This programme is suitable for those in both the legal and maritime industry who are looking to enhance their career prospects. It provides highly specialised knowledge and research skills relevant for both legal practitioners and those operating more generally within the legal environment of the maritime sector. It would also assist anyone working in profession concerned with international trade and maritime environment depending on the chosen line of specialty within the research framework.

It is mainly designed for lawyers, legal advisers, judges and legal draftsmen. But the programme is also open to law graduates of any country who intend to pursue a legal career in the field of maritime law whether in the public or private sectors, whether in practice, administration or academia.

The course is a one-year programme consisting of 6 papers stretched in to 2 semesters. The syllabus includes General Principles of Law, International Maritime Laws, Maritime Security and Safety, Maritime Laws of India, International Trade and Maritime Transport Services, and Maritime Dispute Resolution.

ONE-YEAR ADVANCED DIPLOMA IN GIS AND REMOTE SENSING LAWS

Today every area ranging from missile and unmanned aerial vehicle technology to urban administration, e-governance, remote sensing, energy sector, and even advertising and marketing depend on geospatial data. GIS and Remote Sensing are two exciting areas of technology to work on. Geographic information system

(GIS) is a special system which is designed to capture, store, manipulate, analyze, manage, and present all types of geographical data on earth. GIS technology is an integrated database which has all the information like population characteristics, economic development opportunities, and vegetation types, maps etc. GIS allows to link the databases and maps and create dynamic displays. It also provides tools to visualize, query, and overlay the databases which are technically not possible through spreadsheets.

While GIS helps in explaining and predicting the events on earth, remote sensing is an art and science of measuring the earth with the help of sensors. Remote sensors generally collect the data by detecting the energy that is reflected back from Earth. These sensors are arranged on airplanes and satellites. Remote sensors collect the data in the form of images and manipulate them for analyzing and visualizing the data. GIS and Remote sensors are interrelated as these remote sensors are integrated within GIS systems to visualize and interpret the collected data.

To compete in the ever-growing demand for subject-specific expert in the Industry, and with a view to enable careers in the GIS and Remote Sensing Laws, NALSAR University of Law through its Centre for Aerospace and Defence Laws (CADL), had initiated to offer Course in this area. The program enables candidates of researching, choosing and assessing map source information for use in the arrangement or amendment of

maps and diagrams to different scales. Candidates can have the employments identifying with examining information gave by remote sensing techniques.

The curriculum of the programme is a tailor-made to meet the professional needs of the remote sensing and geoinformatics industry. The course is a one-year programme consisting of 6 papers stretched into two semesters. The papers include General Principles of Law, Remote Sensing Technology and Law, GIS Technology and Law, Coastal Mapping and Coastal Zone Management, Satellite Technology, Remote Sensing, GIS and IPR Issues, and Remote Sensing and GIS Applications in Resource Management.

Remote sensing and GIS is increasingly used by both Public and private companies that sell imagery and data to Google, Bing, scientists, academic and research libraries, and others. Specialists may also find employment at consulting firms, software development firms, and scientific laboratories, where they are expected to improve technologies, software, or data analysis techniques. They can also be hired by various Government organizations who work in this area.

The above Masters and Diploma on-site/online courses are conducted through distance mode and have produced more than 600 students from past 10 years. Most of the students of these courses are working professionals from Ministry of Civil Aviation, DGCA, Airports Authority, Private Airlines etc.



FREQUENTLY ASKED QUESTIONS (FAQS)

1. Could you tell us briefly about the University and the Centre for Aerospace and Defence Laws (CADL)?

About NALSAR and CADL: NALSAR University of Law, Hyderabad, has been a government institution of national eminence in the field of legal education and research and a residential University established in the year 1998 under the National Academy of Legal Studies and Research University Act (Act 34 of 1998). NALSAR University of Law is an approved institution of high importance duly recognized by the Bar Council of India & University Grants Commission. Truth be told, It has been graded as Category-I University by the UGC under Categorization of Universities (only) for Grant of Graded Autonomy Regulations, 2018. NALSAR has been accredited by NAAC with 'A' grade (A++ as per new grading system) with 3.60 CGPA out of 4.00 which is the highest score among all the National Law Schools evaluated till date.

NALSAR has been consistently ranked and endorsed as number one Law University in India and has always endeavoured to promote quality research in contemporary legal issues. One of the contemporary but neglected areas in Indian legal realms has always been Air and Space laws. In order to fill in this gap and to promote further studies and research in this field, the University established the Centre for Air and Space Law (CASL) in the year 2005. Since then, NALSAR-CASL has evolved unarguably as a world class leader in promoting the study of and training in the specialized fields of Air and Space Laws. Moreover, the Centre was upgraded as Centre for Aerospace and Defence Laws (CADL) and has now been offering courses in the area of Security & Defence Laws as well as Maritime Laws.

2. Are courses being offered through Directorate of Distance Education (DDE) at NALSAR recognized?

Of course, NALSAR University has been graded as Category-I University by the UGC and in keeping with the clause 4.10 of the Categorization of the University under [Categorization of Universities (only) for Grant of Graded Autonomy] Regulations, 2018. The Courses have also been duly recognized by the United Nations (UN) under "Education Opportunities in Space Law: A Directory" as notified by the Secretariat of the United

Nations on March 23, 2017 in document "A/AC.105 /C.2/2017/CRP.10".

3. What contents will be provided in the two years M.A. and one year Advanced Diploma Courses? How are these courses structured and conducted?

Please be informed that, the duration is two years for the M.A. Programme and one year for the Advanced Diploma Programmes. The courses M.A. & Advanced Diploma in Aviation Law and Air Transport Management do provide introduction to law and also management initially. Later, on the core legal side, the course shall cover subjects like International and Domestic Air Laws; Aviation Safety, Security and Liability Law; Aviation Contracts & Tenders and Aviation Corporate Laws besides Air Transport Economics and Statistics. In management, subjects like Airport Management; Airline Management, Aviation Marketing etc. are covered. In the final semester of M.A. programme, the students will have to submit a Dissertation on topic so selected by them.

As for the M.A. (Security and Defence Law), it begins with an introduction to law, international security diplomacy and Conflict Resolutions, Defence Technology and Defence Laws, International Institutions and Global Security, Defence Management and strategic studies. The course also touches upon the contemporary and Legal subjects like defence Contracts & Tenders, Defence Procurement Policies, Defence Laws and Policies in India, regional security and Global Governance, Terrorism and Counter-Terrorism, Aerospace and Maritime Security, Cyber Space and Cyber Security etc. In the final semester, the students will have to submit a Dissertation on a topic so selected by them.

As far as the curriculum of the M.A. (Space and Telecommunication Laws) programme is concerned, it includes the General Principles of Law, International Space Law, telecommunication Laws having International and national perspective, Technology and its relation to Space and Telecommunications, IPR Issues in Space and Telecommunication technology, commercialization and issues concerning the Cyberspace and security threats, laws relating to remote sensing and geospatial data and also contemporary issues in space and telecommunication sector. In the

final semester, the students will have to submit a Dissertation on a topic so selected by them.

The courses on M.A. & Advanced Diploma in Maritime Laws begin with an introduction of law and maritime law. Thereafter, the course deals with the specific subjects like International Maritime Laws, Maritime Security & Safety; Maritime Laws of India, International trade and Marine Transport Services and Maritime Disputes Resolution in the First Year of M.A. Programme and Advanced Diploma Programme. In the Second Year of study, the curriculum for MA includes Port Operations and Coastal Zone Management; Law of Shipping Contracts; Maritime Economics; Marine Insurance Law; Maritime Crimes & Jurisdiction Issues; and Marine Environmental Law. In the final semester, the students will have to submit a Dissertation on a topic so selected by them.

The curriculum of Advanced Diploma in GIS & Remote Sensing Laws do include General Principles of Law, Remote Sensing Technology and Law, GIS Technology & Law, Coastal Mapping & Coastal Zone Management, Satellite Technology, Remote Sensing, GIS & IPR Issues, and Remote Sensing and GIS Applications in Resource Management.

For detailed syllabus of each programme, do kindly visit the relevant programme page on the website www.nalsarpro.org or www.dde.nalsar.ac.in or www.cadl.nalsar.ac.in

In so far as Personal Contact Sessions are concerned, they will be conducted by the University once every semester and the candidates may attend them physically or online. The candidates shall be required to do projects / case studies / assignments in each subject for which online guidance will be provided. Candidates will be provided with the Self Learning Material and support through email and web using remote accessibility of e-resources such as Manupatra, Heinonline, JSTOR, SCC Online etc.

4. What is the Eligibility Criteria and who can pursue these Courses?

As for the eligibility criteria, Graduates in any discipline are eligible to apply for the 2-Year M.A. and the Advanced Diploma programmes. Candidates appearing

for the final year examination of Graduation / Engineering are also eligible to apply.

For Advanced Diploma programmes, even the candidates who completed three years of their 5-year integrated LLB Degree programme in Law are also eligible to apply. The candidates are required to check the Admission Notification or the Programme page on the website for further details. In addition to this, candidates with 3-year Degree/Diploma in Aircraft Maintenance Engineering (AME) are also eligible to apply for the Aviation Law programmes.

Lateral entry Admission & Exit provision:

In view of the National Education Policy, 2020, a provision is made for Lateral Admission in the Second Year MA Programme in Aviation Law & Air Transport Management and Maritime Laws for the candidates enrolled for the One Year Advanced Diploma in Aviation Law & Air Transport Management and Maritime Laws respectively.

Further 'EXIT' option is available for the candidates who are enrolled for M.A. (Aviation Law & Air Transport Management) and M.A.(Maritime Laws). If candidates opt to EXIT after completion of the FIRST YEAR, they will be awarded Advanced Diploma Certificate in the said specialisation. For details and complete information, please do check the concerned M.A. Programme page on the website.

5. Does completion of the Masters Programme meet eligibility for further studies?

Yes. It is a Two-Year recognized and rigorous Masters Programme. In addition to the examination, students also do undertake projects and one comprehensive dissertation. One can pursue further studies as well. However, it depends on the eligibility rules prescribed by the concerned Institution.

6. I am a full time regular employee. Am I eligible to pursue these courses?

Yes. These courses are offered through blended mode of Onsite-Online mechanism using Open Distance Learning mode. There will be Personal Contact Sessions for duration of 5 – 7 days in a semester which are live streamed and archived for later accessibility for the enrolled students. For rest of the time, guidance will

be provided through emails / website. Students can also take these courses while pursuing their regular studies.

7. How to apply for these Courses?

The Online Application Form is available on the website www.nalsarpro.org or www.dee.nalsar.ac.in

8. As due to the Covid-19 pandemic, the aviation industry has suffered a lot for the past one and a half year. Do you think, it can again make a consolidated comeback in times to come?

Yes. This is a fact that Covid-19 catastrophe has hit the aviation sector in the world to a great extent but this phase can be transitory and I am sure that this phase shall be taken over by a resurrection in the growth of aviation sector world-wide, though it may take time.

In the year 2019, in India the growth in this sector was found to be greater than 20%. Such figure may be jumped over in times to come. It is the right time that the aviation enthusiasts could spend meaningful time thereby getting themselves equipped with the requisite knowledge and expertise in the field of aviation studies in particular.

9. What is the fee structure for these courses?

4 master's courses and 3 Advanced Diploma courses are offered through CADL. They are –

1. Two-Year M.A. (Aviation Law and Air Transport Management)
2. Two-Year M.A. (Security and Defence Laws)
3. Two-Year M.A. (Space and Telecommunication Laws)
4. Two-Year M.A. (Maritime Laws)
5. One-Year Advanced Diploma (Aviation Law and Air Transport Management)
6. One-Year Advanced Diploma (Maritime Laws)
7. One-Year Advanced Diploma (GIS and Remote Sensing Laws)

The fee for M.A. courses is Rs. 40,000/- p.a (Rs. 35,000/- p.a for defence personnel for S.no. 1,2,4)

The fee for Advanced Diploma courses is Rs. 30,000/- (Rs. 25,000/- for defence personnel for S.no. 5,6)

10. Can the Course fee be paid in Instalments?

As a policy measure, the University does not permit instalments. In a few deserving cases of financial

difficulties, requests may be made to the Director, DDE and such requests shall be considered on a case-to-case basis and the University reserves the right to decide on measures.

11. What is the schedule for the personal contact sessions/Online classes and where do we attend them?

As for the M.A. Programmes, Personal Contact Programmes shall be conducted tentatively for seven days in a semester at Hyderabad by the subject experts concerned.

In case of Advanced Diploma Programmes, Personal Contact Programmes will be conducted tentatively for five days in a semester at Hyderabad by the subject experts concerned.

For the exact number of days of Personal Contact Programme, kindly do check the Programme page on the website.

Attendance at the PCP shall be compulsory for the M.A. Programmes and the candidate should have at least 75% attendance in the PCP to appear for the end semester examination.

Attendance at the PCP is not compulsory in case of Advanced Diploma Programmes, but candidates are advised and encouraged to attend the classes as they are important to understand the rubrics of the subject and successfully complete the course.

The candidates may be given an option to attend the Personal Contact Programme (Classes) either physically or online. The recorded videos of the classes will also be uploaded on the website.

The University shall intimate the exact dates of the classes and the examinations from time to time to the candidates by email in advance.

However, the exams will be held on campus, i.e. NALSAR University of Law, Justice City, Hyderabad.

12. What is the pattern of evaluation and schedule for the examinations?

Evaluation for courses includes projects / assignments and a written examination. Each paper is evaluated for 100 marks out of which 30 marks are for projects / assignments and 70 marks for the end term written

examination. In case of M.A. Programme, students have to submit a Dissertation in the IV Semester on a selected topic, which carries 150 marks for written submission and 50 marks for viva-voce.

13. How will the quality of the syllabus and readings be ensured and continually updated to fit the changing needs and requirements?

Having recognized the dynamic nature of courses being offered and the need to constantly evaluate and update them, NALSAR University has constituted a high-powered Committee consisting of Judges, Experts from Aviation, Space, Defence, Marine Industries, Senior Professors of Law and Management etc. The syllabus of all the programmes so offered is reviewed by the experts. Therefore, we have begun with the fundamental belief that students of these courses can learn better only if they are provided with up-to-date information and hence, we intend to undertake periodic revision of our reading material. Lastly, apart from the reading material, we also do also provide updated information to our students through website and email on regular basis.

14. Will the accommodation be provided by the University, during on-campus sessions?

Accommodation could be arranged in NALSAR Campus, Hyderabad on request and on payment basis. Limited accommodation is available, hence, it will be on sharing and on a first come first serve basis.

15. What employment opportunities will the students have after the completion of these courses? Whether NALSAR will provide job guarantee or job assistance?

Please be informed that Aerospace and defence sectors being truly international in nature do not confine themselves to Indian borders. Students pursuing these courses shall be able to enter the global market and boost their career profiles. Students can expect employment as Managers (Airline Managers, Safety and Security Managers, Operations Managers, International Relations Manager (Handling, Bilateral and Traffic Rights), Legal and Financial Consultants. Job opportunities are also available in Government Organizations such as the DGCA, AAI and various

defence, Space and Maritime Organizations including Private entities in the subject area.

NALSAR being a Government Institution cannot guarantee you a job, we will provide you with assistance and guidance to students who are looking for jobs after completing the course by encouraging smooth interaction between students and prospective employers.

16. How will these programmes help various stakeholders in Aerospace and Defence industries in India?

Indian Aerospace and Defence sectors have been the fastest growing industries in the world. These programmes will be beneficial for the Serving members of the Aerospace and defence industries, policy makers and stakeholders who are working in the government departments, public sector undertakings, negotiators and diplomats who represent the country in the negotiations for various defence procurements, Aerospace Engineers/Students pursuing Aerospace Engineering, Law Graduates desiring specialization in aerospace and defence Laws, M.B.A students and Graduates undergoing various aerospace, defence and strategic studies related Programmes.

Also, there is a high demand for law professionals with expertise in aerospace and defence laws. With the help of these programmes, the candidates can be well prepared for roles in international institutions, government departments (ministries of foreign affairs, defence, justice, home affairs and development), non-governmental organisations, law firms and also in private sectors (aerospace and defence companies).

17. Who are our students?

We have students with a wide spectrum of professional backgrounds who are coming from Indian Armed Forces, Aviation Management, Airports Authority of India, Indian Space Research Organization, International Airports Pvt. Ltd., private airline companies like Emirates, IndiGo, Qatar Airways, etc., Directorate General of Civil Aviation, Security Private Limited Companies, Ministry of Law and Justice, advocates, academicians, fresh graduates etc.

INDIAN JOURNAL OF AIR AND SPACE LAW (IJASL)

Centre for Aerospace and Defence Laws (CADL), NALSAR, as an institution stands for par excellence research and through its courses, journals, newsletters, moot courts, conferences and other activities, bringing the attention of the Aerospace and Defence community to forefront and highlighting its contemporary issues and challenges at a global level.

The Indian Journal of Air and Space Law (IJASL), an exclusive and vital part of the CADL, is inclusive of articles from authors, scholars, and students across the world. This area of study draws its relevance on various specialties: each of which is undergoing doctrinal and practical transformation as a result of new and emerging contemporary developments. This Journal was conceived with the intention to highlight recent developments, relate them to theoretical issues and critically analyse their implications. It caters to a broad spectrum of audience such as students interested in the field of international aerospace and defence laws, practicing lawyers, judges, research scholars and for all the other interested professionals.

Advancement and implementation of ever-evolving aerospace technology has resulted in tremendous global impact to diversify the field on numerous levels and calls for a further heated debate and research in this field. Nevertheless, apart from the academic and practical point of view, such interest for increasing need for exploration and uses of outer space can also be seen through scientific thriller movies, books and illustrations as well.

With the augmentation of globalization, intermingling and interdependence of economies, liberalization of space policies, technological developments in aerospace industry, privatization of certain aerospace segments, and the growing trends in non-interventionist bilateral and multilateral agreements, there is a development of new trends that are emerging in the aerospace industries throughout the world. Privatization and intensified global competition are forcing the aviation and space industries to become responsive, increasingly competitive and committed by focusing more closely on their stake-holders.

The recent venture of the Indian space agency ISRO to explore the surface of Mars is one instance which shows

that the Indian aerospace technology is fast evolving, in response to the development happening elsewhere. While, India has accomplished international acclaim in the area of aerospace technology development and utilization, there is still the need for integration for efforts at the national level, from the standpoint of the private sector. Nevertheless, it is an undeniable fact that the Indian Aviation sector is still in need for reformation in terms of liability, compensation and regulation of competition. At the same time, military missiles and satellites technology requires at par development with the International standards, in an effective and efficient manner as opposed to purchasing the same from other states at an exorbitant price. Therefore, the effort of this Journal is to promote and encourage a healthy and innovative debate on all facets of aerospace industry and ensure that the ethical standards of research are complied with.

Till now, we have published and released twelve volumes of this Journal. The Journal is our modest venture in further and advance research in the field of aviation and space law, and we at Centre for Aerospace and Defence Laws, sincerely hope, to keep up with our efforts for the continuation of the Journal.



Centre for Aerospace and Defence Laws (CADL), NALSAR, as an institution stands for par excellence research and through its courses, journals, newsletters, moot courts, conferences and other activities, bringing the attention of the Aerospace and Defence community to forefront and highlighting its contemporary issues and challenges at a global level.

The Indian Journal of Defence and Maritime Laws (IJDML) is the official publication of Centre for Aerospace and Defence Laws (CADL), NALSAR University of Law, and is dedicated to research, practice, advocacy, education and policy in security and maritime sectors.

The main objective of the IJDML is to encourage original thinking through trans-disciplinary research and thereby facilitate scholarly exchange on contemporary issues concerning Defence and Maritime Laws. It also aims to enrich the emerging jurisprudential discourse in the field of Defence and Maritime Laws.

IJDML aims to contribute in Law and Policy making in the fields of Defence and Maritime Laws at both international

and national level. It also facilitates sharing of research insights among various stakeholders - academia, industry, government, non-governmental entities. It also provides young enthusiasts a platform to share their research.

The Journal publishes Doctrinal, Legal, Policy, empirical, theoretical, methodological and practice-oriented articles and book reviews covering topics relevant to Defence, Security (Homeland and International), Military, Armed forces, cybersecurity, armed conflicts, diplomacy, conflict resolution, and related legal and policy aspects; Maritime safety and security, admiralty law, marine environment aspects, legal and policy issues relating to ships and shipping, passage issues, Law of sea, and other related aspects.

Preference is given to the current and ongoing discussions in legal and policy sectors in all security, Defence and maritime areas in relation to Individuals, Organisations and nations.

The Journal publishes research paper, short articles, book reviews and case law studies.



INTRODUCTION TO AEROSPACE AND DEFENCE INDUSTRY¹

The Aerospace and Defence sector in India is at an inflection point, given the modernisation and indigenisation programmes being undertaken by all the three services of one of the largest military forces in the world. The Ministry of Defence in India has laid out an expansive plan for modernisation of obsolete equipment through long-term perspective plans, capability plans, capability roadmaps and capital acquisition plans.

India being one of the largest importers of arms and defence platforms, the three services, supported by specialised inter-service commands and institutions, have collectively taken upon themselves to be harbingers of 'Make in India' for hardware and infrastructure being inducted into their fold.

The Government of India had also identified the Aerospace and Defence sector as a focus area for the 'Make in India' (i.e. 'Aatmanirbhar Bharat') programme has taken considerable steps to push forth the establishment of indigenous manufacturing infrastructure supported by requisite research and development ecosystem. This is thoroughly evident in the substantial changes introduced in the defence policy framework in 2020, which is now based on the cornerstone of indigenous manufacturing and value addition. With India also opening its space sector for private and foreign participation, this domain could further help in establishing long term opportunities and partnerships, capitalising the synergies in defence and space.

An interplay of policies governing the sector clearly carve out the integral role of Indian manufacturing and value addition in future procurements. One development supporting the above is the establishment of two defence corridors at Uttar Pradesh and Tamil Nadu. These two corridors shall focus upon development of indigenous manufacturing capabilities and in turn become the springboard for all development activities undertaken by the government in the sector.

Aerospace & Defence Sector Landscape

Prior to 2001, the A&D sector was reserved as the exclusive domain of the Government, with private sector participation being prohibited. The only players in the

sector were Defence Public Sector Undertakings (DPSUs), such as Hindustan Aeronautics Limited (HAL), Magazon Dock Shipbuilders Limited (MDL) etc., the Defence Research and Development Organisation (DRDO) and various Ordnance Factories Board (OFBs). Being the first movers in this space, DPSUs have today managed to become original equipment manufacturers (OEMs) for indigenously designed systems. Several platforms like Air Defence Missile System 'Akash', Light Combat Aircraft 'Tejas', Main Battle Tank 'Arjun', Ballistic Missiles like 'Prithvi' and 'Agni', Multi Rocket Launcher System 'Pinaka' and Central Acquisition Radar have been designed and produced indigenously.

In May 2001, the Government for the first time permitted private players to enter the A&D sector by allowing manufacturing pursuant to licensing. Initially, private players emerged in the small arms and ammunition manufacturing space, mostly comprising micro, small and medium enterprises (MSMEs). MSMEs also started participating in the manufacture of parts and components for defence products. The R&D base, however, remained nascent and the Government continued to rely on imports to fulfil more sophisticated needs of the armed forces. New fighter aircraft such as the Sukhoi 30 MKI were inducted into the Air force, Russian submarines made their way to the navy and howitzers such as the BOFORS system were purchased for the army, all through imports.

In 2001, foreign participation upto 26% in the A&D sector was also permitted under the Government approval route. The Government's offset policy (which requires foreign sellers to invest back in India, a part of the price paid by the Government for defence imports) led to the formation of some joint ventures (JVs) between foreign OEMs and Indian players. These JVs were typically only licensed simple component technology by the foreign OEM, to enable the JVs to become part of the OEM's global supply chain. The FDI in the sector was progressively liberalised. In 2015, the government allowed foreign investment up to 49% in the A&D sector under the automatic route. The OEMs, however, continued to shy away from licensing sophisticated proprietary technologies to their Indian JVs, claiming

¹ Sources: <https://corporate.cyrilamarchandblogs.com/2021/04/indian-aerospace-defence-sector-recent-changes-and-their-impact-part-1/>
<https://corporate.cyrilamarchandblogs.com/2021/04/indian-aerospace-defence-sector-recent-changes-and-their-impact-part-2/>
<https://home.kpmg/in/en/home/industries/aerospace-and-defence.html>

their inability to control such JVs as a deterrent. This has made the Government re-think its hard policy stance requiring A&D sector companies to be Indian owned and controlled. Consequently, on May 16, 2020, the Finance Minister announced a hike in the automatic route FDI limit in the A&D sector to 74%.

The Defence Procurement Procedure (DPP), which lays down the rules for capital procurements by the Government, specifies the priority for procurement categories. Progressive iterations of the DPP emphasised on priority being given to procurements of indigenously designed and developed products over imports. With the introduction of the Make procedure in the DPP in 2006, private players were incentivised to develop and integrate high-end technologies in India, for which Government funding would be made available. Relying on manufacturing expertise gained over the years, established players such as Tata, L&T and Bharat Forge started taking on the role of system integrators of sophisticated defence equipment. As a result, in 2011, the Defence Acquisition Council (DAC) approved development of a Battlefield Management System (BMS) as a 'Make in India' project, and two Indian consortia (one led by Tata Power-L&T and the other by Bharat Electronics-Rolta India) were selected to be the development agencies. Then, in 2015, a joint bid submitted by Tata in association with Airbus of France for the 'Avro Replacement Program' was approved.

That said, India has also seen instances where our own armed forces have shown reluctance in inducting indigenously designed and developed systems. In 2016, the Navy had rejected induction of the home-grown Light Combat Aircraft, "Tejas", being dissatisfied with the level of technological sophistication. Then in 2017-18, the Army rejected OFB manufactured assault rifles due to their poor performance during trials. In both cases, the armed forces wished to instead go for imports.

Changing Policy and Mindset

On May 12, 2020, in a bold clarion call to the nation, the Prime Minister announced the ideal of a self-reliant India, with a specific focus on our self-reliance in the A&D sector. This is a strong move, and some might view it as over ambitious, given our present state of preparedness. However, looking at the entire gammut of announcements made by the Government over the past few weeks, it has become clear that the Government is astutely aware of the sophistication of the sector,

formulated through in-depth discussions with the industry, DPSUs and wings within the MoD. The announcements show that a multi-pronged approach is being adopted, not only to reduce India's dependence on imports, but also to increase our exports. The Government has been cognisant of the fact that as of today, India still needs to rely on global imports for high-end technologies and that foreign OEMs have an important role to play in the growth and development of the sector in India. To this end, announcements have been made to incentivise FDI and transfer of technology. At the same time, the Government has formulated a progressive plan for Indian corporates to achieve certain levels of sophistication over the coming years, including through tie-ups with OEMs, which would result in a corresponding reduction in reliance on imports.

Changing Role of the OEM

In 2019, India's military expenditure grew by 6.8% to US\$71.1 billion, stemming from rising tensions with both Pakistan and China. In 2020, India's defence budget stood at INR 471,378 crores. India is the third largest arms importer in the world and represents a very lucrative market for international OEMs to tap.

Until now, foreign OEMs participated in the Indian defence market through strategic procurements under the Government-to-Government route (where the relevant foreign Government assigns India's procurement contract to vendors in its country) or Buy (Global) procurements, which signify an outright purchase of equipment from a foreign vendor.

With a view towards making these foreign OEMs participate in the Indian defence story, the Government imposed the offset policy in 2005. The stated goal of the offset policy is to leverage capital acquisitions to develop the Indian defence industry. Under the policy, foreign sellers are required to invest back into India 30% of the price paid by the Government for defence imports. This can be done through a choice of avenues: purchase of A&D products from India, FDI for A&D manufacturing, technology transfer to India, etc., all aimed at fostering development of internationally competitive defence enterprises in India and augmenting defence R&D. Till now, 54 offset contracts have been signed and the total offset obligations are estimated at approximately US\$ 11.80 billion, to be discharged over a period from 2008-2024.

However, with the policy being in force for over a decade now, offsets have not really served their purpose. Of the total offset obligations, only US\$ 2.83 billion have actually been discharged by the vendors, only about half of which has actually been accepted post audit by the MoD. To assess the impact of the offset policy on the Indian A&D industry, the MoD tasked the Institute for Defence Study and Analysis (IDSA) to undertake a study on offset implementation. The main findings of the study revealed that about 87% of offset discharge has been executed through only 15 Indian Offset Partners (IoPs), with the top five (5) and 10 IoPs receiving 51.76% and 76.11% offsets, respectively. Repeat orders on the same IoPs were common. Importantly, more than 90% of offset discharge was undertaken through purchase of products and services and there were very few takers for transfer of technology or FDI as avenues of offset discharge.

While the large quantum of offsets discharged through purchase of products and services augurs well for India's export ambitions, in reality, these relate to small parts & component export and not to any achievement of actual sophistication. Clearly, the hope that over the years, offsets fulfilled by foreign OEMs would make India a strong industrial hub in the A&D sector have not borne fruit. In addition, international studies reveal that procurements containing offset elements are more expensive (with the OEM factoring in the offset cost into its price bid). Since offsets have only shown minimal results in improving the sophistication of the Indian A&D ecosystem, such increased procurement costs make little sense.

To fix these concerns, the Defence Acquisition Procedure-2020 (DAP-2020), which has been issued with effect from October 1, 2020, aims to strengthen the existing offset related provisions. It proposes higher multipliers for offsets discharged through FDI and technology transfer. Multipliers have also been used to incentivise purchase of complete defence equipment instead of parts & components.

But more importantly, the provisions of the DAP-2020 reflect a move away from reliance on offsets as development drivers. Under the DAP-2020, offsets will no longer be applicable to any ab-initio single vendor cases, such as Government-to-Government route procurements, which account for the bulk of India's import deals. Instead, the Government has increased focus on choosing procurement avenues that require at

least a certain percentage of the total order to be indigenously produced. The indigenously produced component is referred to as 'indigenous content' (IC) in a product, and is arrived at by reducing the value of imported components and fees/royalties paid in foreign exchange from the basic cost of the equipment. The DAP-2020 now specifies higher IC requirements for various procurement categories, as compared to previous iterations. Speaking on this new approach, the Raksha Mantri has said that "Till sometime back, for our defence procurement, we have been looking towards the best technologies available in the world. But now our outlook has changed. We are thinking on how to manufacture latest equipment ourselves or through Joint Ventures or transfer-of-technology." It is expected that going forward, other than procurements undertaken through the Government-to-Government route, the bulk of defence procurements will require IC and technology transfer aspects.

Under the DAP-2020, procurement categories with a higher priority involve procurement from an 'Indian vendor'. To add to this, on August 9, 2020, the Raksha Mantri (Defence Minister) announced that the defence capital acquisition budget of the Indian Government will now on be split for domestic and international procurement, with the domestic budget for the current year being fixed at INR 520 billion. On the same day, the Raksha Mantri also released a list of 101 items which will be banned for import and can only be purchased from within India. The list is not limited to simple parts and components, but also includes sophisticated items such as light combat helicopters, armoured fighting vehicles and submarines. Government sources predict that the ban will result in orders worth INR 4000 billion being placed on 'Indian vendors' in the next 6-7 years.

As per the DAP-2020, an 'Indian vendor' is permitted to have FDI as per extant norms (other than for certain specified categories, which require the vendor to be Indian owned and controlled). Accordingly, for foreign OEMs to be able to participate in the bulk of Indian procurements going forward, they will have to invest in manufacturing facilities in India. While some technology/sub-assemblies for the equipment to be sold to the Government can still be imported, minimum IC requirements will have to be met by showing Indian manufacturing. The minimum IC stipulated by the DAP-2020 is 50%, and therefore, at least some sophisticated manufacturing will have to be transferred to India. With

the Government increasing the automatic route FDI limit in the A&D sector to 74%, it is expected that OEMs should now feel comfortable transferring sophisticated technologies to their subsidiaries in India.

In introducing these changes, the Government has signaled that going forward, manufacturing in India is the only option. The Government has paved the way for foreign OEMs to show that they are dedicated to the 'Make-in-India' initiative, and that to be able to continue to actively participate in Indian defence sales, OEMs will have to become partners in the India growth story.

Changing Role of DRDO, OFB and DPSUs

The size of the A&D industry is currently estimated to be about INR 80,000 crore. Of this, the contribution of DPSUs is estimated to be INR 63,000 crore (which is almost 80%). However, recent parliamentary submissions made by the Government reflect that other than the OFBs, these entities are highly reliant on imports for their production lines. For instance, for HAL's light combat aircraft, which is touted as India's greatest indigenous achievement in the military aviation space, import content remains at 40%. Similarly, for the P75 submarines being produced by MDL, the expected import component is 70%. This suggests that while the final assembly of such products might be taking place in India, large quantities of underlying technologies and components are still being imported.

To change this scenario, as a first step, the Government has taken measures to make the private industry aware of the imports currently undertaken by the MoD and DPSUs, as well as their future requirements over the coming couple of years, by unveiling the SRIJAN portal on August 14, 2020. The portal is meant to convey indigenisation opportunities to the private sector. It provides detailed information such as the name of the OEM from which the product is presently being imported, annual import value, product specifications and the 'Make-in-India' target year for the product. Indian vendors can scan the portal and indicate their interest in indigenising a particular product, and the MoD/relevant DPSU will then work with the vendor to formulate an indigenisation plan for the product. Since all procurement categories under the DPP allow a vendor to have at least 49% foreign investment, Indian industry could use the information available on the portal to establish tie-ups with foreign OEMs depending on their present capabilities and production lines.

In addition, the DRDO, which is the primary R&D wing of the MoD, has released a policy under which DRDO patents will be made available to the Indian industry at zero cost. The patent licensing policy covers all Indian patents granted to the DRDO. Licensing will be undertaken on a non-exclusive basis and the DRDO will retain ownership. The policy stipulates that such licenses will only be granted to manufacturing entities, and not to traders, ensuring that licensing will lead to actual growth of the Indian A&D manufacturing base. In addition, the DRDO has also presented the MoD with a list of 108 systems and sub-systems that can be indigenously designed and developed going forward. To aid the process, the DRDO will provide support to the Indian industry on a requirement basis. Items on the list include bullet proof vehicles, marine rocket launchers and navigation radars. As the Indian industry steps in to take over production of these items, the DRDO can concentrate on development of more critical technologies.

Conclusion

All the recent steps taken by the Government further the cause of 'Atmanirbhar Bharat' in the A&D sector, planned to be achieved in a progressive fashion over the coming years, with targets set for indigenisation as well as exports. The Government has shown a concerted effort to lay down enabling policies to achieve this goal. But the devil lies in the detail, i.e., implementation. A major factor that impedes interest in the sector is the long procurement cycle and uncertainties associated with the process. India's large defence capital procurement budget may entice players but often, actual investments are only made once some level of order certainty is available. The implementation of the Strategic Partnership (SP) model, which was introduced under the DPP-2016, is a classic example. Meant to encourage private Indian industry participation in development of strategically important high-end systems (such as fighter aircraft and submarines), the SP model envisages Indian industry tying up with a foreign OEM to bring sophisticated technologies to India. However, so far, no order has been placed under the model, and the Government has done several flip-flops in issuances of RFPs and shortlisting of vendors. The next few years will be important from the context of seeing how these policy changes are implemented to achieve the desired results.

Aerospace and Defence Laws Lecture Series, 2020

Centre for Aerospace and Defence Laws (CADL), NALSAR University of Law had organized “Aerospace and Defence Laws Lecture series” to critically examine and explore the opportunities in the Aviation, Space, Defence, Maritime, GIS & Remote Sensing Laws. This webinar series was organized in June and July, 2020. In the turbulent times of Covid-19 in 2020 and with the restrictions on mobility in 2020, the webinar series was conducted online. There has been tremendous response from the students, researchers, Industry experts, Academia etc. The following are the part of Aerospace and Defence Laws Lecture Series –

1. Aerospace and Defence Education: Need of the hour
2. Mapping India's Defence and Security Challenges: A Way Forward
3. Impact of COVID-19 on the Indian Aviation

Industry

4. Unlocking India's Private Space Sector: Legal and Policy Challenges
5. Application of GIS and Remote Sensing Technologies: Trends and Prospects
6. India as a Maritime Power: Contemporary Perspectives

E-Certificates of attendance are provided to the attendees. Certificate of participation are provided to the attendees who had submitted papers/write-ups on the Aviation, Defence, Maritime, Space, GIS and Remote Sensing Laws. Some of the submissions are published in this newsletter, while some articles are published in the “Indian Journal of Air and Space Law” and “Indian Journal of Defence and Maritime Laws”. The recordings of the series are available on the Youtube Channel of NALSAR University of Law.

Speakers for “Aerospace and Defence Laws Lecture Series, 2020”



Shri. A. S. Kiran Kumar, Former Chairman, ISRO

Shri A. S. Kiran Kumar is Vikram Sarabhai Professor at the Indian Space Research Organisation, Bangalore. He is a Member of the Space Commission, Government of India and Member, Governing Council, Indian Institute of Science, Bangalore. During the period from January 2015 to January 2018, he has served as Secretary, Department of Space, Chairman, Space Commission and Chairman, Indian Space Research Organisation.

He has steered the implementation of the applications-oriented Indian Space Programme, which has facilitated rapid development of the country in many important spheres of earth observation, communication, navigation, meteorology and space science, as well as the development of indigenous launch vehicles and

related technologies for providing assured access to space.

He has also contributed to the design and development of more than 50 Electro-Optical Imaging Sensors flown on Spaceborne platforms starting from Bhaskara TV payload in 1979 to the payloads onboard the Mars Orbiter Mission in 2013. He has played a crucial role in Chandrayaan-1 mission right from the conceptualisation stage and has made exemplary contributions to the success of Mars Orbiter Mission and Reusable Launch Vehicle -Technology Demonstrator (RLV-TD).

Shri Kiran Kumar has been conferred with Honoris Causa and DSc by 18 Indian academic institutions

Dr. Swarna Subba Rao, Former Surveyor General of India

Dr. Swarna Subba Rao is a Surveying and Geo-Spatial professional who has almost 34 years of experience encompassing all disciplines of geospatial technology in developing geospatial strategies for



Survey of India and other related ministries within the Government of India. Dr Rao has led Survey of India as the Surveyor-General from 2010-15 and 2016-17. He is now Adjunct Professor at NALSAR University of Law.

Prof. P.V. Rao, Visiting Faculty, NALSAR University of Law

Prof. P.V. Rao obtained M.A. in Political Science from Osmania University, with a first division; M.Phil and Ph.D in European Studies from School of International Studies, JNU. He was awarded the British Council Scholarship



at London School of Economics for research; Fulbright Post-Doctoral Fellowship at the School of Advanced International Studies (SAIS), Johns Hopkins University, Washington; Ford Foundation Fellowship at Bandarnaike International Centre, Colombo. Prof. Rao is the founder Editor of Indian Ocean Survey, a biannual international journal, now being published by the Routledge, UK. He published over forty research articles in Indian and foreign journals. Prof. Rao was the Director of Centre for Indian Ocean Studies, Osmania University; Member, UGC Committee on Area Studies; Member COM, Indian Ocean Research Group, Perth. He regularly lectures at College of Air Warfare; college of Naval Warfare and several other academic institutions.

Dr. M.Y.S. Prasad, Vice-Chancellor, Vignan's Foundation for Science, Technology and Research University

Dr. M.Y.S. Prasad worked in ISRO for 40 years from 1975 to 2015 in different Centers and Units in the executive positions. He retired from Govt. service in May 2015 as Distinguished Scientist (APEX) in ISRO, and Director of Satish Dhawan Space Centre, Sriharikota, ISRO. During his long experience in Indian Space programme, Dr. M.Y.S. Prasad steered various activities



and programmes in ISRO. He was involved and controlled all the launches of Launch vehicles from 2008 to 2015. Dr. M.Y.S. Prasad created a number of new systems and processes in ISRO which includes new MCF at Bhopal, New Mission Control at SHAR. He was Chief Designer for a large beam steering Phased Array Radar with most sophisticated and advanced features, and the Radar is called Multi Object Tracking Radar (MOTR) commissioned in SDSC-SHAR. Dr. M.Y.S. Prasad represented ISRO & INDIA in United Nations Committee on peaceful uses of Outer Space (UN – COPUOS) for eleven years from 1995 – 2006. He is active in International Professional Organizations like IAF, IAA, and IISL etc.

Dr. K. Ramesh, Founder and Director of Center for Human Security Studies

Dr. Kanneganti Ramesh Babu is the Founder/Director of Center for Human Security Studies (A Think Tank on Security Studies). He holds a Ph.D in American Studies from School of International Studies, Jawaharlal Nehru



University (JNU)-New Delhi & a Post-Doctorate in Security Studies from BESA Center for Strategic Studies –Israel. He is associated with the National Investigation Agency, National Industrial Security Academy (NISA), Central Detective Training School (CDTS), Hyderabad, as well as Octopus, Counter-Terrorism Centre of Andhra Pradesh Government. Dr. Ramesh was the Course Co-ordinator for the General Studies subject at Rajiv Gandhi University of Knowledge Technologies, Hyderabad. A Guest Faculty (International Relations) at the Sri Chaitanya IAS Academy, Hyderabad & he taught a course on “Contemporary Themes in Indo-US strategic Ties” to international students at Study in India Program at the University of Hyderabad.

Group Captain Aanand Naidu Pola, Adjunct Professor, NALSAR University of Law, Director, ISAC; Cyberange and Clean Exit

Group Captain Pola A Naidu has 30+ years of experience largely in management and policy



intervention. He was Director Personnel (Airmen) of IAF before prematurely leaving the forces. He served as Additional Director General in Doordarshan and All India Radio (Prasar Bharati) heading Corporate HR,

Administration, PR, IT&SM Operations, litigation management and Security, and International Relations. He is presently associated with Aakash Law LLP (www.aakashlaw.com), an Aviation law firm as a transactional practitioner, and Director of two cybersecurity firms (www.isac.io and www.cyberange.io) and a workplace ethics rating firm known as Clean Exit Consultancy Services Ltd (www.cleanexit.io). He has been contributing to CADL, NALSAR University as an Adjunct Professor, teaching Aviation Law and Air Transport Management.

Prof. Arvind Kumar, Professor and Chairperson, Centre for Canadian, United States and Latin American Studies, School of International Studies, Jawaharlal Nehru University, New Delhi



Dr Arvind Kumar is currently Professor and Chairperson, Centre for Canadian, United States and Latin American Studies, School of International Studies, Jawaharlal Nehru University, New Delhi. His area of the specialisation is in the field of strategic

technologies for India's national security, foreign policy issues and matters relating to global security. He was research faculty at the National Institute of Advanced Studies and the Institute for Defence Studies and Analyses, New Delhi. He also taught at Delhi University. He was Visiting Fellow at the Centre for International Security and Cooperation (CISAC) at Stanford University and a Post Doctoral Fellow at the Cooperative Monitoring Centre of Sandia National Laboratories, USA. He was also a Visiting Fellow at the Henry L Stimson Centre, Washington, DC and the University of

New South Wales at Sydney. He was APISA Fellow at the Institute for Defence and Strategic Studies, Nanyang Technological University at Singapore. He has a number of publications to his credit and has delivered a number of lectures both at India and abroad.

Mr Rajshekhar P, Founder Director, Information Sharing and Analysis Centre (ISAC)

Mr RajShekhar P is the Founder Director, Information Sharing and Analysis Centre (ISAC), a non-profit organisation working in the field of Cybersecurity. ISAC is a PPP Partner of NCIIPC, MOU Partner of CERT-IN, AICTE, MDI Gurugram and



many PSUs, helping in cybersecurity capacity building. ISAC has a mandate of training 100000 each in Cyber Security and workplace ethics. Cyberange (www.cyberange.io) and Clean Exit (www.cleanexit.io) are two of the incubations out of ISAC. He has about two decades of experience in corporate and government support functions in cybersecurity. He has organised the Malcon international Conference in 2010 on behalf of NCIIPC and hosts the Defend The Flag series of seminars for CERT-IN and NCIIPC. He owns numerous IPs in Cyber-Physical Systems, Virtual Labs and other products in Cyber Security.

Gurmukh Singh Bawa, Senior Advisor at Aviation Industry; Former General Manager (PR); Airport Economist at Airports Authority of India

Over the past 34 years, Mr. Bawa has been associated with the Government Working in general and Civil Aviation Industry in particular. Mr Bawa has attained experience in the areas of Civil Aviation which involves



Corporate Planning, Economic Planning, Traffic Forecasting at the corporate level as well as airport level. Mr Bawa is an Economist and Statistician by profession and also worked in the Corporate Planning Department

of the Airports Authority of India and Headed the Public Relations Department.

During his long span of service say about forty years, he has gained experience in Operations Management, Qualitative & Quantitative Analysis, Setting up of new departments, Course Development Unit, Statistical Unit, MIS Unit in AAI and a full-fledged Administration Department in AERA which is a regulatory Organization under the Indian Government and there he served from inception till his retirement in 2016; say more than six years, as Officer On Special Duty (OSD) directly reporting to Secretary, AERA.

Mr Bawa is widely travelled within India and the world over and represented India and AAI at various official platforms including ICAO, ACI, IATA etc.

Mr. Shashank Jain, General counsel, TATA SIA Airlines Limited (Vistara).



Shashank is the general counsel of TATA SIA Airlines Limited (Vistara) and has experience of more than 12 years in legal and compliance domain. At Vistara, Shashank leads the purchase and leasing of aircraft, aircraft engines and

BFE, and is involved in strategic decisions such as airline partnerships. He has previously worked with several law firms including AZB & Partners and Trilegal. He has wide-ranging experience in corporate finance, aviation laws and regulatory matters. During his stint in private practice, he represented the likes of IFC, FMO, JBIC, Airbus, Boeing, Qatar Investment Authority, and KKR on a large number of transactions.

He is an alumnus of Symbiosis Law School, Pune and the George Washington University Law School, Washington DC.

Mr. Nitin Sarin, Advocate, Managing Partner, Sarin & Co

Nitin Sarin specialises in asset/aircraft, finance/leasing/repossession & is a qualified lawyer (in both India & England and Wales) and also the Managing Partner of Sarin and Co.; He has completed his B.A.;

LL.B from the Army Institute of Law, Mohali. He has also completed his Advanced LL.M. in Air and Space Law from Leiden University, Leiden, the Netherlands. He is a licensed advocate with the Punjab and Haryana High Court and a Solicitor of the Superior Courts of England and Wales.



At Sarin and Co. he handles various Aviation, Consumer, Asset Financing, Labour, Rent, Corporate, Trademark law cases. He has extensive experience and interest in the field of aviation law and civil land matters. He saw through the execution of an affiliation agreement with Donald H Bunker & Associates (Dubai) for aviation-related legal matters.

He successfully advised an aircraft manufacturer for a massive 2018 order of 75 Boeing 737-8 MAX aircraft worth over \$ USD 8 billion. He is a member of the aviation enthusiast community <http://www.airliners.net> and has contributed to their database of aviation photographs. Apart from the above and most importantly, Sarin is a Coldplay fan and is currently collecting tickets to Coldplay concerts he has attended around the world.

Ujjwal Bakshi, Manager, Industry Relationships-India, IATA

Ujjwal Bakshi is Industry Relationship Manager at International Air Transport Association (IATA)- the trade association for world's airlines, representing some 290 airlines or 82% of total air traffic. IATA supports many areas of aviation ecosystem and helps formulate industry policy on critical aviation issues.



At IATA, Ujjwal works on policy advocacy and regulatory affairs matters in India, Nepal and Bhutan. He engages with government and industry stakeholders to channelize the Association's policy development initiatives that support industry priorities.

Ujjwal is a seasoned public affairs professional with

expertise in advancing business interests before diverse stakeholders. Before joining IATA, Ujjwal has worked as a consultant advising clients across the aviation, information technology and mobility sector. In the past, he has worked as the Assistant Secretary for the Business Aircraft Operators Association, an industry body working towards creating a level-playing field for business/private aircraft operators.

Mr. Sagar Singamsetty, Founder and Managing Director, Aerospace and Aviation Lawyers Association of India (AALAI) and Adjunct Professor of Law, CADL, NALSAR University of Law



Sagar brings a wealth of information and a wealth of network from his 14+ years of international experience in the mobility and transport sector as a legal, regulatory and policy expert. Apart from the practical know-how gained through various in-house roles at Amazon, FedEx/TNT, AerCap, Sagar developed a strong bond with academics over the years.

Teaching aviation and general transport laws at NALSAR, in 2011, Sagar as Chief-Editor published a compilation of articles on air and space law, 'Contemporary Issues and Future Challenges in Air and Space law'. In 2019, started a global competition, Dr. APJ Abdul Kalam Air and Space Law and Policy Essay Competition, whose objective is to promote and raise awareness on the legal and policy issues in the field of aviation, space and in general, the transport sector(s). Currently is the Founder and Managing Director of Aerospace and Aviation Lawyers Association of India (AALAI) that serves in addressing the developments in Air, Space and Transport law and policy in India.

Mr. K.R. Sridhara Murthi, Director, International Institute of Aerospace Engineering and Management, Jain University, Bangalore

Mr. Sridhara Murthi is the Director of International Institute of Aerospace Engineering and Management, Jain University, Bangalore. He has managed Antrix Corporation to outstanding success. He is an expert in Space Policy and International Space Law with high-

level experience in the Boards of International Academy of Astronautics, International Institute of Space Law and International Astronautical Federation. He has experience in promoting international collaborations and represented in the United Nations Committee on Peaceful Uses of Outer Space. In 2011 he held a position in the Office of Adviser to India's Prime Minister as Senior Expert on Public Information Infrastructure and Innovations in India.



He has rich experience in space commercialisation and space policy analysis and played key roles in India's Space programme for over three decades. He represented India as a delegate to the United Nations Committee on Peaceful Uses of Outer Space. He has served as Managing Director of Antrix Corporation, and also as Scientific Secretary of Indian Space Research Organisation (ISRO). He has extensively contributed to technology transfer and space industry development programmes in ISRO and also served as a counsellor at Embassy of India in Paris, promoting cooperation between space agencies/ industry from Europe and India's space establishments. He had contributed to a published study on National GI policy. He was a member of the Interim Core Group set up by the Planning Commission of India for evolving the National GIS system and is Fellow of Institution of Engineers, India.

Mr. Narayan Prasad, Co-founder and Chief Operations Officer at satsearch.co

Narayan Prasad is a co-founder at satsearch.co, a global marketplace for space supported by the European Space Agency. He also serves as a Partner to SpacePark Kerala, a Government of Kerala initiative to develop a dedicated space activities hub in India. He believes that there is an opportunity to create a \$25 billion space industry ecosystem in India by 2030 which can take



space-based products and services from India to the rest of the world. He previously served as an Associate Research Fellow at the European Space Policy Institute where he contributed to enhancing cooperation between Europe and India in space. He has authored over 75 articles in various national and international publications and has previously studied in India, Germany, Sweden and France. He is also an elected member of the International Institute of Space Law and an awardee of Emerging Space Leaders by the International Astronautical Federation. He is the host of the NewSpace India podcast and can be reached by email on narayan@satsearch.co or [@cosmosguru](https://www.instagram.com/cosmosguru).

Mr ASHOK G.V., Partner, Factum Law



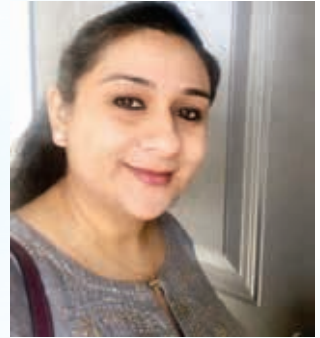
Ashok G.V. is a Partner with Factum Law, Bengaluru, India. As an attorney, he specialises in Commercial disputes representing clients from aerospace, healthcare, manufacturing, remote sensing and technology industries in

Intellectual Property, Taxation and Company dispute among others before conventional and alternative dispute resolution fora. Ashok advises space technology companies on SATCOM regulations and remote sensing regulations, in addition to rendering his expertise for contract management, structuring investment transactions, asset management and enforcement and risk management.

Ashok is a member of the International Advisory Council of the International Academy of Space Law, a Moscow based organisation which is engaged in promoting the peaceful use of outer space and has delivered talks at the Kalpana Chawla Annual Space Policy Dialogue in Delhi and the Asia Pacific Satellite Communications Council's conference held at Bangkok on space policy and regulations. Ashok has also authored several papers and articles on the subject of regulating commercial space activities, responsible use of space, privacy concerns surrounding remote sensing data mining and legal issues in space sustainability in reputed domestic and international publications.

Mrs. POORVI KANTROO, Space Law & Policy Head Aerospace and Aviation Lawyers Association of India (AALAI).

Poorvi heads the space division at the Aerospace and Aviation Lawyers Association of India (AALAI). Before this, she directed the Space policy division at erstwhile Aryavara Space Organization. She is also a



Doctoral Candidate at NALSAR. She recently submitted her thesis title: Space Debris through the lens of commercialization, the need for an international legal framework, and is awaiting viva. She also earned her LLM degree in Corporate Laws and Governance from NALSAR. She has a decade long relationship with CADL and served the center in various capacities such as Researcher, Module Instructor, Organizing Committee Manfred Lachs Moot Court, International Manfred Lachs Conferences, etc. She was a Key Judge for the recently conducted 1st APJ. Kalam Essay Competition. She was also selected by The International Institute of Space Law (IISL), Leiden, to judge at the prestigious Manfred Lachs Moot Courts Memorials 2016. She is an associate editor for the Indian Journal for Air and Space Law (IJASL), published by CADL, NALSAR.

Her endeavour as an academician is to be the fulcrum between the public and private sector, enabling both sectors to flourish within the domain of Space law.

Prof. I. V. Murali Krishna, Professor and Director R&D and Dr Raja Ramanna DRDO Distinguished Fellow

Prof. Dr. Muralikrishna V Iyyanki, a PhD holder from the Premier Institute -Indian Institute of Science (IISc), Bangalore and is presently Dr Raja Ramanna Distinguished Fellow at the Defense Research and Development Organization



(DRDO), India, and also the National Coordinator for

Geospatial Public Health, which is National Networking Government of India Project. He is

Professor and Founder/Head of the Centre for Spatial Information Technology (CSIT) at Jawaharlal Nehru Technological University (1990-2005), and Director of Research and Development Centre (2005-2008). He has served as guest scientist at German Space Research Institute (DLR) and GKSS Research Centre. His present research focuses on hyperspectral remote sensing image classification and geospatial public health management and geospatial technology applications.

Reghunatha Menon.K.P PhD , Group Head Training & Education Group, NRSC, ISRO, Hyderabad



Born on 03.11.1961 Kollengoe, Palakkad District, He has completed M.Sc. (Mathematics), Kerala University with distinction in 1985; Ph.D in Municipal Information System from JNTU, Hyderabad in 2009.

He has over three decades of experience in various capacities at NRSC, ISRO Hyderabad. He is Responsible for satellite data dissemination from the Indian Remote Sensing (IRS) missions. He also worked as Project Manager for satellite missions, viz., IRS-1B and IRS-1D, including carrying out critical operations for other IRS missions such as IRS-P6 and CARTOSAT.

Dr. Menon is Life Member of Geospatial professional bodies like (i) Indian Society of Remote Sensing (ISRS), (ii) Indian Society of Geomatics (ISG) and (iii) Indian National Cartographic Association (INCA), Indian Society of Systems For Science and Engineering (ISSE), and also the Vice President of ISSE, Trivandrum Chapter 2018 – 2019. He was Joint Secretary of ISG from 2016 -2019 and worked as Secretary of ISG Hyderabad Chapter.

Dr. G. Sreenivasa Reddy, Additional Director General, Telangana state Remote Sensing Application Centre (TRAC)

Dr. G. Sreenivasa Reddy has distinguished service of

over 25 years in Indian Space Research Organisation (ISRO). He joined National Remote Sensing Centre (NRSC), the space technology application centre of ISRO in 1991 and has held various positions in Remote Sensing & GIS application area of NRSC.



He has specialized in the application of geospatial technologies for development and management of natural resources. He has handled various prestigious space application programmes of NRSC/ISRO like National Drinking Water mission, Integrated Mission for Sustainable Development, Space based Information Support for Decentralised planning, Integrated watershed Management Programme etc.

He has guided several M.Tech and PhD students, brought out methodology manuals, published over 55 research papers in Journals and also contributed chapters in books. He is a visiting faculty at JNTU, NIT-Warangal, External Examiner for M.Tech programme.

Ms. Priya Iyengar, Visiting Faculty Lecturer, CADL, NALSAR University of Law and founding partner, Compass Law associates.

Ms. Priya Iyengar is a Founding Partner of Compass Law Associates. She specializes in Corporate Law, Industrial & Labour Laws with Strategic IR & HR Management and Aviation Law. She has over 22 years of experience in Formation of Companies, Corporate Governance, Corporate Reorganization and Reconstruction, Joint Ventures, Statutory filings under Company Laws, Merger & Acquisitions, Labour and Employment Laws Statutory Compliance, International Commercial Arbitration, Conflict Analysis and Resolution.



Commodore Udai Rao, former Principal Director, Naval Intelligence, and a former Director in the Cabinet Secretariat

Commodore Udai Rao was commissioned into the Indian Navy on 1st Jan 1974. During his 32 years of naval service, he has served in various appointments, both ashore and afloat, with the rich command, staff and administrative experience. He has commanded three frontline ships, INS Kavaratti, INS Hosdurg and INS Gomati as also other shore units. He holds an MSc (Defence Studies) degree from Madras University and is a graduate of Defence Services Staff College (DSSC) Wellington. He has subsequently also been a Directing Staff on the faculty of DSSC Wellington. He has undergone the “Army Higher Command Course” at Army College of Combat, Mhow, M.P

He was a part of IPKF operations and was Indian Naval Commander (INCOM) at Kankasanturai in Northern Sri Lanka in 1987. Earlier he had patrolled the Palk bay extensively while in command of INS Kavaratti. He has also served as Chief Staff Officer (Operations) at Navy Office in Chennai from 1994 – 1996 where he oversaw operations such as OP TASHA in the Palk Bay, Gulf of Mannar and in the waters around Sri Lanka...

An important appointment that he held was that of Principal Director Naval Intelligence (PDNI) at Naval Headquarters, New Delhi for a period of five years from 2001 to 2006 including during OP PARAKRAM.

Commodore Rao has the distinction of having served as a Director in the Cabinet Secretariat where he set up the Maritime Division and handled strategic and security issues at the National level. He has also been a Diplomat at our mission in the Fiji Islands with concurrent accreditation to Cook Islands, Kiribati, Nauru, Tonga, Tuvalu and Vanuatu.

Commodore Rao's areas of interests include Maritime and Coastal Security, Maritime Diplomacy, Blue Economy. Indian Ocean issues, China in the IOR, Intelligence and Security issues, and Geo-Political & Geo-Strategic issues impinging on the Maritime Domain pertaining to countries and areas of interest to India.

Cmde Rao is a recipient of the 'Binoculars' on being adjudged the best cadet onboard INS Krishna in 1972. He was awarded the Lentaigne memorial medal for the best dissertation while undergoing the Staff Course at DSSC, Wellington in 1986. He has received the Chief of Naval Staff's Commendation on two occasions.

Cmde Udai Rao superannuated from Government service in Sep 2013 and has settled down in Bangalore. He keeps himself busy writing and talking on 'Matters Maritime' at universities/colleges/think tanks such as National Institute of Advanced Studies (NIAS) Bangalore, Christ University, Bangalore; Pondicherry University, Manipal University, Osmania University, SV University Tirupati, Aerospace and Defence Seminars conducted by IESA, Indian Naval Academy (INA) Ezhimala, Acharya Bangalore Business school (ABBS), National Academy of Customs (NACIN) Bangalore, NMIMS Law school Bangalore etc. He has also conducted seminars on Coastal Security at Takshashila in Bangalore and at Mangalore University and lectured at the Press Institute of India, Chennai. He is closely associated with the Coastal Security Police of Karnataka and has conducted sea work up of Coastal Security personnel, of approximately 60 days duration between 2015-2018. He has recently conducted harbour and sea training of the customs marine wing Mangalore for 10 days and sea training of customs marine wing, Mumbai for 14 days. He also occasionally writes for Deccan Herald, Hindu Business line and the Federal online newspaper on maritime subjects.

He is currently on the adjunct faculty of Raksha Shakti University Gandhinagar, Gujarat and is a trustee of the Institute of Contemporary Studies Bangalore (ICSB).

Ms. Hamsa Devineni, Practising Maritime Lawyer & writer; International Visiting Faculty, Nalanda University, Rajgir; and Visiting fellow, India Foundation

Hamsa Devineni is a practising maritime lawyer and an active politician in India. Academically, she holds a distinction in LLM in Admiralty and Maritime Laws from Tulane University Law School in the USA alongside a post-graduate diploma in patent laws from NALSAR University. Hamsa launched her maritime career with a campus placement by “One Earth Future Foundation”, a Not for profit organization in the USA where she worked on analyzing maritime trends &



framing policies for the United Nations Contact Group on Piracy off the Coast of Somalia (UNCGPCS). She was the Project Officer in the “Oceans Beyond Piracy” programme, which along with various international maritime organizations like the International Maritime Bureau (IMB), and the Maritime Piracy Humanitarian Response Programme pioneers in publishing annual reports and papers on issues concerning world maritime piracy.

She is now a partner at Haven Legal, a law firm, and practices on both the original and appellate sides in various subject matter jurisdictions. Hamsa often writes and speaks on current maritime legal issues and has also drafted and reviewed various maritime legislative bills for the State and Central governments in India. She has been a research associate at the National Maritime Foundation, New Delhi, an autonomous maritime think tank, supported by the Ministry of Defence and the Indian Navy. She is also a visiting fellow at the India Foundation, New Delhi, a premier think tank on national policy & foreign policy issues.

Alongside profession, Hamsa actively participates in public service, politically, through the Bharatiya Janata Party. She is the spokesperson for BJP in Andhra Pradesh and has contested elections as the BJP candidate for the Ananthapur Lok Sabha constituency in the recently concluded General Elections.

Dr. A. Subramanyam Raju, Professor, Co-ordinator, Centre for Maritime Studies, School of Social Sciences & International Studies, Pondicherry University.



Adluri Subramanyam Raju is Professor in the Centre for South Asian Studies & Coordinator of the UGC Centre for Maritime Studies at Pondicherry University, Pondicherry. He was the recipient of the Mahbub Ul Haq Award (Regional Centre for Strategic Studies (RCSS), Colombo, 2003); Scholar of Peace Award (WISCOMP, New Delhi, 2002) and Kodikara Award (RCSS, Colombo, 1998). He was a Salzburg Seminar

Fellow (2006). He received the National Best Teacher Award (C.V.S.Krishnamurthy Theja Charities, Tirupati, 2017) and Best Teacher Award twice (Pondicherry University, 2013 & 2018). He was a Visiting Fellow at the Bandaranaike Centre for International Studies, Colombo, May 2012. He is on the editorial board for five journals. He has published about fifty-five papers and presented about eighty papers at national and international seminars.

He has twenty two books to his credit: Authored: Democracies at Loggerheads: Security Aspects of US-India Relations; Third-Generation Indian Perceptions of the Kashmir Issue; Indian Women Scientists' Perceptions of the Nuclear Issue; Co-authored: Maritime Cooperation between India and Sri Lanka; Edited: Nuclear India: Problems and Perspectives; Terrorism in South Asia: Views from India; Reconstructing South Asia: An Agenda; India-Sri Lanka Partnership in the 21st Century; Good Order at Sea: Indian Perspective; Maritime Infrastructure in India: Challenges and Prospects; Blue Economy of India: Emerging Trends; Rethinking Regionalism in South Asia; Borders in South Asia: States, Communities and People; Human Security in South Asia: Concept, Environment and Development; New Futures for South Asia: Commerce and Connectivity; Indo-Pacific: Changing Power Dynamics; Indian Ocean and Indo-Pacific: India Betwixt; Understanding Governance in South Asia; Co-edited: Envisioning A New South Asia, India-Southeast Asia: Strategic Convergence in the 21st Century; Greater Connectivity and Integration in South Asia' & Ocean Governance: Emerging Trends. His forthcoming publications include New India from Maritime Perspective; Governance and Poverty in South Asia; & French Presence in the Western Indian Ocean Region.

Aerospace and Defence Laws Lecture Series, 2020

Aerospace and Defence Education: Need of the Hour

June 30, 2020

NALSAR UNIVERSITY OF LAW

WEBINAR ON JUNE 30TH
@18:00 HRS

**AEROSPACE AND DEFENCE EDUCATION:
NEED OF THE HOUR**

Organized by Centre for Aerospace and Defence Laws (CADL)
www.cadl.nalsar.ac.in

Panelists:

- Prof. (Dr.) V. Balakista Reddy
- Dr. Swarna Subba Rao
- Prof. P.V. Rao
- Dr. M.Y.S. Prasad
- Dr. K. Ramesh
- Group Captain Aanand Naidu Pola

The Aerospace & Defence sector in India is at an inflection point, given the modernisation and indigenisation programs being undertaken by all the three services of the second largest military force in the world. The Ministry of Defence in India has laid out an expansive plan for modernisation of obsolete equipment through the Long Term Integrated Perspective Plan (LTIPP), Technology Perspective & Capability Roadmap (TPCR) and Services Capital Acquisition Plan (SCAP). India being the third largest importer of arms and defence platforms, the three services, supported by specialised inter-service commands & institutions, have collectively taken upon themselves to be harbingers of “Make in India” for hardware and infrastructure being inducted into their fold.

The Government of India had also identified the Aerospace & Defence sector as a focus area for the “Make in India” program and has taken considerable steps to Push forth the establishment of indigenous manufacturing infrastructure supported by requisite research & development ecosystem. Additionally, the Government of India has, as part of its budgetary allocation, acceded to the establishment of two Defence Corridors at Uttar Pradesh and Tamil Nadu. These two corridors shall focus upon development of indigenous manufacturing capabilities and in turn become the springboard for all development activities undertaken by

the government in the sector.

Centre for Aerospace and Defence Laws (CADL) had organized a webinar series, “Aerospace and Defence laws Lecture series”, which brought together academics, legal practitioners, and experts from the field, to critically examine the education in Aviation, Defence and Space Laws, and explore the current trends in these sectors.

The following were the Panelists in this Webinar:

- Dr. Swarna Subba Rao, Former Surveyor General of India
- Prof. P.V. Rao, Visiting Faculty, NALSAR University of Law
- Dr. M.Y.S. Prasad, Vice-Chancellor, Vignan's Foundation for Science, Technology and Research University
- Dr. K. Ramesh, Founder and Director of Center for Human Security Studies
- Prof. (Dr.) V. Balakista Reddy, Registrar, Head of Centre for Aerospace and Defence Law (CADL), NALSAR University of Law

Moderator:

Group Captain Aanand Naidu Pola, Former Addl Director General DD & AIR and Adjunct Professor, NALSAR University of Law

Opening Remarks of Group Captain Anand Naidu:

Recent Developments made by India for the use of its space assets to India creation of space board named as Indian National Space Promotion and Authorization center. Indian aviation will have a long lasting impact because of the ongoing crisis.

Huge import burden due to lack of research and development then Aviation MRO has not picked up pace even countries like Sri Lanka and Middle eastern countries have their own MRO as a result Indian airlines companies have to send their aircrafts to these countries for the C as well D checks which results in a massive loss of revenue as well. Aviation industry before the covid 19 crisis was posting its profit figures in double digits things got disrupted. Regulation of space assets was not considered but Dr. Kasturi Ranjan director of ISRO has stated that we have a potential of creation of 2 lakh jobs then we also have the potential of creation of eco system and a paradigm shift towards space products. Indian space department has been successful in achieving in small milestones as well.

Deliberations from the Panelists:

Dr. Swarna Subba Rao- Development of Geospatial technology attribution of data for planning as well as design of a project with the integration of spatial and non-spatial data the computer technology sources of geospatial data aerial platform , satellite imagery as well as drone photography . Maps in today's time are not just driving apps but also the driving economics tool as well if gis technology is present. In 2010 the Mckinsy global institute report highlighted that land mark distortions in India lead to 1.3% loss in GDP annually. This amounts to \$34.45 billion each year at current values. Then with effective use of mapping and digital technologies in our land records management an unlock 34 billion dollars. This amount almost equals to FDI equity inflows into India between April and December 2017 making India one of the top FDI destinations. With the use of mapping technology the project cost gets reduced by almost 5 to 10%. Contribution to global economy \$1trn business sales got facilitated by digital maps in 2016. 4 million direct jobs get generated with the mapping service globally then 75% of sectors which represent global GDP get directly benefitted then around 550 billion dollar consumer benefits derive from map services. Then there is a 5% improvement in revenues as well as cost savings

by the company then with map digitalization it also helps in the reduction of vehicular emissions because of digital mapping. The use of the GIS technology is being used by many infrastructural companies which accounts for 22.1%, then 15.7% used by utilities companies, 13.9% used by urban development companies, 5.5% by mining oil and gas companies, 4.9% by water resources and irrigation, 2.8% by defense and internal security, 5.3% by education and research, 4.3% by land administration and rural development, 0.9% by retail and logistics, 0.9% by NGA and the rest 23.8% is used by others. With the geospatial diversifying into new markets it has even helped during disaster management, defense and internal security, natural resources, BFSI, Infrastructure, Urban Development and retail and logistics. The key takeaways can be from services segments which amounts to the largest part of the Indian geospatial market with 74.4% market share in financial year of 2017-18, then sizeable part of Indian geo industry caters to the overseas market, which exports range of service, India imports majority of the hardware requirement for the surveying as well as for special measurement purpose as well. Land and survey segment alone is estimated to have more than 5,000 enterprises employing nearly 2 lakh. The industry lacks a solution centric approach and is more inclined to sell software and hardware.

However the strengths of the Geospatial industry has presence of local as well as global technology leaders; there is global acknowledgment of the remote sensing programme as well then there is also a strong workforce which caters to the local as well as overseas requirements the weakness is however with the absences of a robust geotactic infrastructure, strict controls on the data access, then there is missing domestic hardware manufacturing capacity. However there is a unique opportunity with regard to the increased focus on the use of the geospicticla solutions, then there is a high growth in the internet led growth related service as well.

The GIS technology yields a decision support system based on the data in the project; it can be applied effectively in any engineering, municipal as well as revenue projects. In terms of modernization cadastral mapping and creating a national land data system it will lead to fewer cases in the court as well. With the help of drones in the GIS it is one of the best sources in terms of

capturing the geospatial data of high resolution, it is one the fastest, then it can even be used in traffic management , agriculture mapping and even in the crowd as well as disaster management as well.

Even for fitting the water meters in Shimla GS data was used this technology is more of a convenience and gives accurate information as well.

Prof P.V.Rao- India as a country has neglected the sea from both the perspective of the economy as well defense with India having a long coastline along with both the eastern as well as Western front if its potential is tapped it can be an asset for a country like India. With An oceanic presence of around 7516 km we have lost a lot of exclusive economic zones like any other country. Most of the sea resources belong to the country which has certain control over it. UNLS has given the right with regard to the ocean domain India is very keen on developing with regard to its sea resources in its recent policy. Mangroves, sand dunes, even seaweed can be used in the generation of pharmaceuticals, jellies as well as cosmetics. Today's GOI has ensured that the sea resources remain utilized most of the technological advancements in today's time weather it would have been adequate in today's time as compared to the sea resources the GOI has launched 2 schemes such as Blue economy the Indian ocean countries such as Sri Lanka as well as Mauritius are being taken into consideration. Blue economy also means that we should be careful with the sea resources as well. There is an over exploitation of the resources as well. The ports around the country need to be upgraded; around 400 modernized ports are being upgraded under the sagara project as well. Unfortunately in the ports infrastructure India is lacking very behind even the European cargo ships first dock at Arab ports as well as Malaysian ports only 10% of the global cargo is carried by the Indian ships this effects the Indian economy very badly. The Sea size of India is one the biggest and its potential must be tapped.

Dr. M.Y.S Prasad- Space technology covers the launch pads the payloads as well as the application which it carries the missile technology when it comes to defense technology it is different area including the final landing of the weapons which is a part of the missile technology then in relation to the aircraft technology it is both civil as well as defense aircrafts and now a days there is a very important development in terms of the defense that is

drone which are known as UAV these are covered by aerospace it's a multi discipline if one has to plan deceive or manufacture , launch and operate one has to do proper design there needs to be a proper development then for space craft's there needs to power system and orbits then in terms of payloads it should be able to do it with the modern day defense technology. Using all these things there should be a lot of application in terms of remote sensing as well as communication application. The launch competitors should work in a proper method when required to launch these satellites in orbit. One of the emerging area in today's time is the habitation on the moon which is a upcoming prospect for the future then the upcoming communication technology which will improve in connecting the islands as well as the sea vessels live extension of the satellites will result in the removal of the space debris when it is a complex field it will require an enhanced law there have been 5 treaties.

When it comes to aerospace engineering institutes there are 65 colleges which are providing education in these fields for under graduation as well as post-graduation. The ISRO team over 30 to 40 years developed launch vehicles. Indian Institute of space technology located in Trivandrum has made immense contributions in the development of the space field.

Dr. Kannegati Ramesh- Defense and security is one of the most important aspects there needs to be a written national security strategy so that resources can be used to achieve the overall security objective. The maritime consciousness needs to be also protected from external threats like China, Pakistan and even from smaller countries. There are multiple problems waiting: unity and diversity has become India's vulnerability, aerospace and defense is the need of the hour, many universities in India do not have courses on external affairs, defense strategies as well in today's time we need to evolve ourselves as a smart power. The current funds as well as resources which are dedicated towards the defense education is grossly inadequate, the kind of problems which is being faced by India from its neighboring countries is going to cause major problems the Indian ocean is a gift and should be taken as an asset only a small amount is being assigned to India's defense strategies aerospace as well as defense education is the need of the hour.

Professor V. Balakista Reddy- Regulation is a must in almost all aviation in today's time. It is regulated by ICAO

which has almost 193 countries which are its members. Then aviation is regulated a lot through bilateral agreements including with the European Union as well as SAARC nations international regulations for the aviation is a well-developed field. Public air law deals with the technical as well as economic aspect then the second aspect is in relation to the security aspect then the penal air law.

The Chicago convention of 1944 was one of the biggest conventions which took place in terms of aviation globalization has made aviation one the most profitable field in terms of investments with the deregulation as well. It has been like a boom. The deregulation of aviation started with the United States , Europe , Africa.

On the contrary the Indian aviation regulation from 1947 to 1952 was the era of pre nationalization then from 1952 to 1994 was the era of Indian Airlines as well as Air India then post 1994 came the time of private airlines in India. For the aviation sector a population is like an asset. If we look at India it does not have proper infrastructure in terms of aviation development. We need proper MRO'S. All these things have a lot of potential and can be a big job creator in a country like India if proper investment is made in the aviation sector.

Mapping India's Defence and Security Challenges: A Way Forward

July 7, 2020

NALSAR UNIVERSITY OF LAW

WEBINAR ON JULY 7TH
@ 18:00 HRS

MAPPING INDIA'S DEFENCE AND SECURITY CHALLENGES: A WAY FORWARD

Organized by Centre for Aerospace and Defence Laws (CADL)
www.cadl.nalsar.ac.in

Panelists:

- Prof. (Dr.) V. Balakrishna Reddy
- Prof. Arvind Kumar
- Mr. Rajeshkumar
- Dr. K. Ramesh
- Group Captain Anand Naidu Pola

As part of “Atmanirbhar Bharat”, and to push towards self-reliant India, Union Finance Minister Nirmala Sitharaman, has announced significant structural reforms in major Sectors including the Defence. An inevitable outcome of these reforms is Private Participation in the Defence Industry. Subsequent to the hugely successful inaugural session on June 30, 2020, the 2nd Webinar of the series titled “Mapping India's Defence and Security Challenges: A Way Forward” was organized on July 7, 2020.

The Panelists in “Mapping India's Defence and Security

Challenges: A Way Forward” discuss the private participation in Defence Sector, Role of Private agencies in National Security and Cyber Security.

Questions discussed during the Webinar:

- What is the role of Private Security agencies in maintaining and promoting Indian National Security?
- Is Private participation in the Defence sector a boon or a bane?
- How is Cyber Security guarding National Security?

Panellists:

- Prof. Arvind Kumar, Professor and Chairperson, Centre for Canadian, United States and Latin American Studies, School of International Studies, Jawaharlal Nehru University, New Delhi
- Dr K. Raesh, Founder and Director of Center for Human Security Studies
- Mr Rajshekhar P, Founder Director, Information Sharing and Analysis Centre (ISAC)
- Prof. Balakista Reddy, Registrar, Head, Centre for Aerospace and Defence Laws, NALSAR University of Law

Moderator:

- Group Captain Aanand Naidu Pola, Adjunct Professor, NALSAR University of Law, Director, ISAC; Cyberance and Clean Exit

Remarks of Moderator:

Group Captain Naidu- India had to pay a heavy price for peace due to the 1962 India China War. The history is filled with looters, invaders various times. It has observed that war and battles never came to an end in India. When needed about security India needs to have a strategy according to Dr. APJ Abdul Kalam India needs to show up to the world until and unless we don't either of the countries will respect India as a country. Only strength respects strength.

Deliberations by the Panellists:

Professor Arvind Kumar- The most important case study in the current scenario is the standoff between India and China. The intentions are clear that China wants to establish its identity as a defence super power. The Galwan valley experiment has gone beyond expectations and the question arises whether India was prepared for this challenge.

India's defence concerns have grown over the years India has been under increased pressure from all the front lines of its border be it land, sea or air. These are increasing everyday new and emerging challenges as well as strategy will remain affected due to developments related to policies. The world has witnessed an IT revolution. It has posed a significant challenge as insider information can be passed on very easily from one country to another. Intelligence information provides an ace to the country in terms of deciding its policies with regard to the other country.

More and more information is better for a country to decide its policies. The defence concerns of India are not just limited to its borders but even India's internal problems have similar external problems as well. India's defence concerns need to be addressed as early as possible. The question arises does India have the synergy as well as Plans ready if in tomorrow's time there is a big attack which is planned against India there is a lack of integral planning there is a larger aspect which still needs to be addressed and India should have a wholesome plan ready.

In defence equipment development there is a visible dysfunction as well there is also lack of coordination between Research and Development, production as well as the users there is a lack of synergy between public and private agencies as well there was a trust defecate which led to private sector always being kept at bay with regard to the government policy the private industry has been contributing enough in the fields of the atomic energy and there research and development has been quite significant in terms of private sector godrej as a company contributed significantly. In the satellite development private sector has also played a major role, even in the light combat aircraft Tejas small and even large contractors have contributed immensely even the unmanned air vehicle for which the air frame was built by a private agency despite these developments things have not been expanding the department of atomic energy took a lot of help from Larsen and Toubro. In terms of building the ballistic missile neither country has helped India but the private sector has helped India immensely in this development.

India needs to transit itself from net importer of defence equipment to the net exporter of the defence equipment India needs to tap the capabilities of its private sector India as a country should learn from the experience of the United States in terms of the Public private partnership for any projects success private sector does pitch in with the investment even India's IT industry has done well but still it has not brought significant change in India due the fact that its potential was never tapped the government never planned for the IT revolution it was spontaneous, 20 years ago 6 task forces were set up by India's then defence minister Mr. George Fernandez to find about the nexus can be built the proposals made by the task forces are still on the paper for India needs to modernize its armed forces

there is no point in keeping the armed forces at bay. With the evolution of the defence start-ups it has really shown that India can really improve its defence position.

Dr. K. Ramesh - Freedom from attack and freedom to attack can be summed up to national security. Freedom from fear and security is more of a psychological concept; we are secured as well as empowered. How can we make a self-dependent, self-empowered India without having food, water, environmental, girl security? We cannot achieve national security. There should be a balance in the defence budget in terms of procurement of arms and ammunition. The balance must also be on public health, food security. This is the traditional security. Israel and India's geopolitical strategies are quite the same. Israel is the best model to take as an example the American Jewish lobby has always watched the interest of their own country and same should also go for the American Indians who are there in the American congress should also seek as well work for the interest of India as a country.

The Indian defence model should take Israel as a model till today we do not have a written national security strategy the need of the hour is not only Private participation but also proper strategy in place as well. With 3488 km we share our land border with China 15,000km of the land border we have and 7500km of the coast line we have. Total 22,000 km we have to safeguard but the question remains to what extent we have imported arms and ammunition from Israel in the last 70 years India needs to have proper procurement at proper time we need to self-reliant these are the fundamental questions which arises day by day. Out of our GDP only 2% contribution is taking place in terms of research and development.

Geopolitics of the artificial intelligence especially cyber security area we are somewhere down the line in 1st 20 we have come a long way the role of private security agency for the overall national security we have a lot of issues there is no enormity with the emergence of LPG given the 21st century scenario private security has become important. China is taking advantage of the fault lines of India's internal politics. We need to have a strategy of 100 years. The belt and road initiative is still on road.

Mr. Rajshekhar Pulabatlal- India needs to generate foreign cyber intelligence, offensive security as well as malware research, the need to enhance CERT-IN and

NCIIP, generously funding indigenous cyber security start-ups as well as building capacity in cyber. With regard to the generation of cyber intelligence it should be open to the private sector for cyber intelligence acquisition which can work with the defence, create business opportunities for artificial intelligence, data analysis, app creation as well as product development then even provide with the IT infrastructure to facilitate intelligence as well.

There is however no mechanism present once a great project takes place the government immediately replaces the officer with this the new person does not entertain the project team and the entire project collapses as well. If there is a long term plan as well as good documented strategy things will get better.

In order to reduce offensive security as well as malware research there should be investment in the development of the next generation malware research instead of buying from Israel or the USA, there should be promotion of the Indian platforms as well and there should be promotion regarding the hacking culture and events.

There should be enhancement of CERT-IN and NCIIPC by providing them with more funding, there should be creation of greater collaboration by public private partnership and there should be empowerment to have a greater say in the cyber security of the private players as well as the CII. In countries like China and Israel they work as one nation as well as a team but in India there should be more unity. There should be funding for start-ups for cyber security as they bring in innovation, start-ups have their initial share of struggle to create innovation as well as technology. There should be the right kind of support by giving them the right environment. There should be training on the cyber physical system based simulation which is the key for building capacity in terms of emerging technologies, training should not only be given to the law enforcement agencies but also to parents, children's and lawyers as well in order to stop cybercrime.

There should be capacity building as cyber security is a big crime which is increasing day by day.

Impact of COVID-19 on the Indian Aviation Industry

July 12, 2020

NALSAR UNIVERSITY OF LAW

WEBINAR ON JULY 12TH 2020 @15:30 HRS IST

IMPACT OF COVID-19 ON THE INDIAN AVIATION INDUSTRY

Organized by Centre for Aerospace and Defence Laws (CADL)

www.cadl.nalsar.ac.in

Prof. (Dr.) V. Balakrishna Reddy
Member, Board of Studies for Aerospace and Defence Laws (CADL), NALSAR University of Law

Mr. Gurmukh Singh Bawa
Senior Advisor at Aviation Industry; Former General Manager (PR); Airport Economist at Airports Authority of India

Mr. Shashank Jain
General Counsel, TATA SIA Airlines Limited (Vistara)

Mr. Nitin Sarin
Advocate, Managing Partner, Sarin & Co

Ujjwal Bakshi
Manager, Industry Relationships-India, IATA

Mr. Sagar Singamsetty
Founder and Managing Director, Aerospace and Aviation Lawyers Association of India (AALAI) and Adjunct Professor of Law, CADL, NALSAR University of Law

The impact of COVID-19 is for real and this unprecedented health crisis is pushing the global economy into turmoil. The aviation sector, predominantly airlines and airports are very badly hit due to this pandemic. The International Air transport Association estimates that the global aviation industry will lose \$252 billion in 2020. Some analysis shows that the overall drop in global GDP is 6% due to this pandemic and because of the several restrictions imposed by the governments.

With these circumstances in mind, CADL has scheduled its 3rd Webinar in “Aerospace and Defence Law Lecture Series” titled “**Impact of COVID-19 on the Indian Aviation Industry**” on July 12, 2020, at 3:30 PM IST.

Questions Answered in Webinar

- What are the financial, operational, legal and policy hurdles faced by Airlines and Airports as a consequence of government policies?
- Will innovation, sustainability and use of new digital technologies take a back seat for the lack of funds/investments from businesses?
- Is the customer at the heart of these discussions or is it just corporations and governments trying to win over each other?

Panellists:

1. Gurmukh Singh Bawa, Senior Advisor at Aviation Industry; Former General Manager (PR); Airport Economist at Airports Authority of India.

2. Mr. Shashank Jain, General counsel, TATA SIA Airlines Limited (Vistara).
3. Mr. Nitin Sarin, Advocate, Managing Partner, Sarin & Co
4. Mr. Ujjwal Bakshi, Manager, Industry Relationships-India, IATA

Moderator:

Mr. Sagar Singamsetty, Founder and Managing Director, Aerospace and Aviation Lawyers Association of India (AALAI) and Adjunct Professor of Law, CADL, NALSAR University of Law.

Remarks of Moderator:

Covid-19 has impacted the majority of the industries in the world Aviation sector plays a key role in connecting the entire world in today's time, be it people or goods. During the covid-19 the people in the aviation industry have worked tirelessly in repatriating standard people as well as bringing medical supplies as well transport as a field is most of the time taken for granted and majority of the people don't realize the amount of hard work which is put into it.

With travel restrictions still in place and many passenger flights still continue to remain affected the air cargo on the contrary has really boomed during this period of time specially during the time of crisis, the financial support received by the aviation sector is very low the legal regulatory as well as policies present are not very strong and there are still a lot of hurdles present too.

The air passenger traffic has also fallen a lot to 48% which is not normal. The situation was not even that bad during the time of recession of 2008 but this time it's quite bad the airport operators have seen a huge drop in the passengers by almost 50% the same even goes for airlines. Tourism sector which is supported by the transport industry remains totally affected reason being that health in today's time remains priority but the impact is pretty bad and time to rebuild confidence in people so that they can resume travelling back will take a while as well even the trade has also suffered massively and even the job losses are quite bad as well in today's time.

The overall economy has contracted as well the cash flow in the market is quite low the Indian economy was struggling since 2019 and with covid 19 it has become even worse, even in Europe the financial condition of the airline is such that it will last for maximum 6 months only despite best efforts by the government in bailing out the airlines still the path ahead looks quite tough for the low cost airlines in Europe.

There has been a lot of reduction in the fleet due to the fact that number of airlines have suspended their services and even due to the social distancing measures as well even airlines like British Airways announced that it plans to cut 9000 jobs Emirates is also going on the same track the fixed cost will remain such as terminals which will remain present where lease rentals will be paid so there are the cost which will not go anywhere then even the security measures cost will also go up which will directly or indirectly even impact the air fares as well. This is because the overall Aviation sector remains in place at least in Europe and the other parts of the world for a while before recovery takes place. The road to recovery is quite bumpy with no support coming from the government as well.

Deliberations by the panellists:

Mr. Ujjwal Bakshi- There are about 290 member countries which are members of IATA(International Air Travel Association) which accounts for almost 82% of the world air traffic.

With the current crisis the global impact has been such that airlines around the world have reported a total net loss of 84.3 billion dollars there have mass flight cancellations reported as well in which around 7.5 million

flights got cancelled from the period of January to July 2020 there has been a 54% decline in the demand for the flights and the total net revenue loss has been around 419 billion dollar which is almost 50%.

Year 2020 has been one of the worst years in the history of civil aviation with regard to civil aviation in India there has been 49% change in passenger demand as compared to the previous year 2019 the projected loss is of around 11.6 billion dollars and to top it off there are around 3.06 million jobs which are at risk the loss of Jet Airways has already hurt the Indian aviation industry and the Covid 19 crisis has just made it worse.

In order to save the Indian aviation sector there needs to be some urgent reformatory measures which need to be put in place such as direct financial support, loans guarantees, and support and tax relief as well. The other financial support which needs to be given to the aviation sector in India is on

- ATF
- Corporate Income Tax
- GST
- Withholding Tax
- Export Transactions
- Air Passengers Fees
- Airport and ANSP charges
- Employment based taxes

Then additional measures which need to be put in place include

- Dispensation of the Airline Slot Usage Rules
- Extension of professional licenses and approvals
- Removal of physical examination rules which are imposed by CBIC since the introduction of 'auto out of charge' for facilitated shipments of the express cargo
- Waive Bank Guarantees undertaken from airlines for operations at the Indian airports
- Oil marketing companies to extend unsecured interest free credit terms
- Penalties for airlines for cancellation and delays should be dispensed temporarily
- Waiver of the INAD penalties

For the recovery journey the government should understand the need for aviation sector to be up and running, USA Singapore and Australia have got 123

million dollar financial aid in India although direct financial benefits are yet to be seen however indirect benefits have been noticed but the requirement in more this is the perfect time when the long pending issues can be addressed.

Even with the pool conducted by the IATA it has been observed that 47% of the people want to resume travelling back after 1 month or so which is a positive sign to expect the whole recovery process will require some amount of inspiration which the airline will have to offer to the passenger in order to get them back on travelling even in the pool conducted by the IATA it has also been noticed that passengers are very much concerned regarding the quarantine rules in which there are chances that they will catch virus.

In order to resume air transport in a secure manner there should be biosecurity measures which should come in place which include during arrival such as automated procedures for customs and border control, accelerated processing and baggage reclaim to enable social distancing, health declaration with robust contact tracing as well. During the time of departure there should be restricted access to the terminal building, temperature screening at the entry points of the terminal building, increased use of the self service options for self check in and reduction in congestion with respect to priority boarding. Then during the flight there should be reduced food as well as beverage service, then mandatory face coverings and reduced congestions of the passengers on board (example queues for washroom) through these measure there will definitely be a certain amount of confidence build up in the passengers which will get the airlines to put there fleet back in the air.

Mr. Shashank Jain – The majority of the airlines during the time of travel restrictions carried a lot of cargo even for free but despite all this there has been no direct financial aid which has been provided to the airlines as such. The support which the airlines have requested the government for is more on the policy basis as well as legal than direct expertise or loan although there have been airlines who have requested loan although not to the government as it's pretty obvious that the government itself is not in the position to bail out any of the airline. The policy as well as the legal reforms which needs to be changed still in today's time are quite rigid

and there has not been any change whatsoever the government did start the consultation process in which there were certain issues which had to be addressed but still the issue have not been addressed as such only airlines have been provided the additional air corridors are being freed up for the civilian air traffic but this won't matter much during this period of time as there is hardly any air traffic the existing air corridors are sufficient for the airlines. The legal issues are with the bringing of ATF under the GST but what the government has done with the ATF is that it has levied additional charges on it and moreover even with the capping of the fares this has made matter worse for the airlines the taxes are being increased GST has been a long standing demand for the industry then there has been a long pending issue regarding the custom duty the airlines have to import certain parts from outside like engine and so on initially the custom duty was levied but however now the airlines company are required to pay for the customs duty this still remains to be a long pending issues as this adds up to the additional cost for the airlines as well.

The aircraft leasing structure happens through the Irish leasing structure the government is getting very aggressive even on the leasing and is increasing the taxes as well if this system remains in place it will destroy the low cost carries as owing up a fleet remains quite expensive that's why airlines now a day's prefer to lease the aircrafts as it saves up major cost for them moreover the cost of operations are increasing day by day.

Then the other types of issues which the Indian airlines are facing in the today's time are the lack of developed bond market and availability of cheap finance through capital market as the market is not mature enough as compared to the Chinese airlines which are more resilient to the corona impact because they have been able to raise very cheap finance in China in order to support themselves and the advantage for the airlines are also the fact that the amount which they have to pay is divided in many and they are able to save the finance the bond market is very strong and the government is also providing support but however for the Indian airlines it is almost non-existent the rupee has been depreciating against the USD since last year.

There are other restrictions in terms of foreign exchange regulation like for example if an airline has to give a letter

of credit to the foreign company but this letter has to be issued by an Indian bank to the foreign company. The cost for the airports as well as parking fees this has proven to be very costly the airlines have also requested the airlines to step in this and issue some kind of waiver which can relief the airline with this Burden but this has not been provided the other demands made by the airlines have been for the permission of having credit shell. Eventually there will be a lot of M&A activity which will take place, there will be fewer airlines and the airlines who will survive this crisis will be the ones who will emerge the stronger ones. Also another trend will be rationalization of the crew as well as pilots. With this crisis the system of Hub airports will become less in the sense that passengers will prefer to fly directly to their destination. This is good news for the Indian carriers as they will be able to capitalize on their hubs and will be able to provide direct connectivity as well.

Mr. Gurmukh Singh Bawa- Before the impact of Covid-19 there was a lot of crisis as the infections were picking up so there was a lot of impact on facial recognition as well in order to reduce the impact of human to human contact as well.

The pandemic has made technology as the need of the hour before the covid crisis technology was not given much of favour as it was thought of as an employment killer. Physical activity was being done by the robots, artificial intelligence as well as facial recognition. Govt of India even before the covid-19 crisis has launched digi yatra which is nothing but digital travel and with the covid-19 the ICAO on 10th of July has launched the ipax everybody is instinct with the technology.

ICAO has launched a full aviation recovery task force as well. They have also advised countries that they should launch the aviation recovery task force as well. It's a duty of all stakeholders to be a part of the taskforce. This pandemic is the rarest of the rear despite there being so many pandemics in the past the impact on the aviation industry was minimal but in this particular pandemic the impact has been quiet bad as aviation presence has been also impacted a lot, the aviation was virtually grounded the stability will be unseen for a while. From February to April the negative impact was most with 80% on the countries like Sweden, UAE, UK, Singapore, and Italy. If we have to look for the recoveries we need to look

at these countries as they remain to be the most affected of all. The global scheduled airlines have declined from 100 million to merely 30 million this is an alarming figure around 17th march even Canada introduced travel restrictions as well one of the major fears remains are the health of passengers, hygiene at airports, hygiene inside aircrafts and even maintaining hygiene at the Destination airports as well if these fears are eradicated then no one on the earth will stop the recovery of the aviation sector, the operation hurdle include contact tracing with social distancing measures which will be a bit problematic for a while on financial terms 600+ aircrafts have been grounded which is not a small number as a grounded aircraft is like a liability for the airline even wear and tear are huge expenses biggest hurdle in the operation is the health of the crew . Countries like the UK and US have also tested various measures in which the health of the crew is not jeopardized as even the airline staff are themselves not confident to fly. In the recent relief package of the government there has been no mention of the airlines but however the government has mentioned about the rationalization of the airspace as well as MRO'S with rationalization of airspace there will be less fuel consumption.

India has been leading the growth in civil aviation as well with India reporting about 11% growth in the civil aviation as well genes are strong to win the higher growth pattern.

Mr. Nitin Sarin- The crisis has brought the industry to its knees. There is a lack of capacity as well as demand the people are sacred despite the government opening up there will only be a small amount of public which will be travelling. Credit shells have been a big issue with the government stepping in to protect the rights of the passengers but even the airlines were helpless as the travel ban kept on increasing as well. The civil aviation requirement says that airline can keep the money under the credit shell subject to 2 things like it has to be only in exceptional circumstance and it has to be with the concurrence of the passenger only, the tax issue is also a major hurdle which the airlines are facing and even the leasing issue as well the overall cost is also increasing as well then even ATF tax as well as GST on ATF aviation in today's time is still seen as a luxury commodity the government has so many industries as well to look after .

Legal hurdle which the government will face is that the government will have to stay up to date, the VBM mission has also come under the scanner despite Air India doing a fantastic job of repatriating passengers from countries but in larger scheme of the international aviation law they have done one interesting thing which is they not only flew back standard Indians but were also selling seats from India to the USA for the fare paying passenger shell of passengers buying these tickets was very vast from OCI holders to long term visa holders so this ruffle of feathers which led to the US governments

restricting the VBM flights. Capping of fares the capacity as the airlines are only allowed 45% of its capacity, a free market is always the best judge of whether debts are growing for the airlines. The Air India disinvestments remains an interesting perspective to watch out for financial support by the government will also be watched upon consumer confidence will also remain a major thing how airlines will thrive their business there will be minimum 3 to 5 years for the pre covid times return of the air traffic this will be a mere make or break movement.

UNLOCKING INDIA'S PRIVATE SPACE SECTOR: LEGAL AND POLICY CHALLENGES

July 19, 2020

WEBINAR ON JULY 19TH 2020 @15:30 HRS IST

**UNLOCKING INDIA'S PRIVATE SPACE SECTOR:
LEGAL AND POLICY CHALLENGES**

www.cadl.nalsar.ac.in

Padma Shri. A. S. Kiran Kumar
Former Chairman, ISRO

Mr. K.R. Sridhara Murthi
Former President, International Academy of Space Law

Mr. Nityan Prasad
Founder and CEO, Space Matters

Mr. ASHOK G.V.
Partner, Pictus Law

Mrs. Poorvi Rastogi
Space Law & Policy Head, ISRO

Introduction By
Prof. (Dr). V. Balakista Reddy
Registrar, Head of Centre for Aerospace and
Defence Law (CADL), NALSAR University of Law

Moderated By
Mr. Sagar Singamsetty
Assistant Professor of Law, CADL,
NALSAR University of Law.

A brief: Unlocking the Private Space Sector

The growing number of space investors suggests that governments recognize that space resources can provide a country with socio-economic advantages. Satellite was originally only operated for military purposes. We can now see that in space technology, there is a great deal of interest from the private sector. The growth of the space sector has increased to 46% by last decade. Luxemburg has more satellites than that of Germany, Argentina and Spain. The Indian space economy is worth 7 billion dollars, which constitutes about 2 percent of the global space market. ISRO has made a solid foundation in the development of the space sector.

Recent trends in the space industry: Demand for space-based application and services has been increased; Launch costs have been reduced; Lack of investments in for R&D. Major issues that India is facing right now: Lack of established policy/regulatory framework and guidelines for technology commercialization.

Questions answered during the session:

- The role of private participants in the Space Sector?
- Is In-Space a step towards the development of the Indian Space Sector? What principles should guide the set-up and implementation of the In-Space organisation?
- What are the Operational, legal and policy hurdles

faced by the Indian space sector especially in light of the Space Activities Bill?

Keynote speaker:

Shri. A. S. Kiran Kumar, Former Chairman, ISRO

Panelists:

- Mr. K.R. Sridhara Murthi , Director, International Institute of Aerospace Engineering and Management, Jain University, Bangalore
- Mr. Narayan Prasad, Co-founder and Chief Operations Officer at satsearch.co
- Mr Ashok G.V., Partner, Factum Law
- Mrs. Poorvi Kantroo , Space Law & Policy Head Aerospace and Aviation Lawyers Association of India (AALAI)

Moderator:

Mr Sagar Singamsetty, Founder and Managing Director, Aerospace and Aviation Lawyers Association of India (AALAI) and Adjunct Professor of Law, CADL, NALSAR University of Law.

Deliberations by the Panelists:

Mr. Ashok G.V

Key Topics Discussed:

What is the precipitating factor in space reform? Secondly, what are private sector expectations and legal implications for unlocking the potential of space?

The global communications service provider announced from 2009 to 2014 that it is going to move from the previous constellation of satellite communication to the so-called Technology Platform. In the past, TCS worked as a partner with IMARSAT-13 to bring BSNL services between 2009 and 2012 into the country where transition occurred. When the changeover occurred with BSNL, they were looking for Isatphone Pro 3 into the country, so the issue was under which unified license category would this service be subject to?

In response the regulator said that they will fall under the category of GMPCS. Issues raised, that specific service called GMPCS has not received an order from the Telecommunications department, as it does not meet our country 's regulations. Thus, TRAI suggested that they would fall within the Sui Generis licensing category.

The decision was made vulnerable for the whole country by the delay that was almost five years. In addition, INMARSAT-13 is used for the communication of defense, which means that national safety interests have not been adequately met since the regulators have delayed decision-making.

Another scenario that is currently emerging regarding the frequency, causing lawyers' confusion. If the company needs to set up a satellite, they need to follow some spectrum regulations or guidelines. In order to ensure compliance with spectrum regulations, the National Frequency Allocation Plan (2018) must be followed. There is no clear picture in the national frequency allocation plan whether or not spectrum is available. The policy is unclear about what type of application your satellite should be able to set up in space, so we're used to counting how much competition is on the market. The policy is silent on bilateral investment treaties. It will create a great deal of time uncertainty, and that will affect space industry investment. There should be no conflict of interest by the Regulatory Authority.

There are a lot of expectations firstly predictability and investment, freedom of Commerce expediency and business promotion. The government needs to come back with the investment agreement template so that the investors do not take advantage of companies coming into Indian territory.

Mr.K.R. Sridhara Murthi

India needs a strategic outlook to unlock the space programs. Earth observations emerge as major market benefits for mobile technology positioning development and big-data analysis, which in India have tremendous potential that can lead to innovative use of this technology.

Space security is becoming particularly important in the environment where space waste is a major concern. Following the Moon Agreement, international space law saw a major step. In particular for the space environment, in particular for the space environment, India needs new technological entrepreneurs and programmes, with the resources available for the space programmes being used. India has an enormous opportunity for satellite communication with multiple

spectrum bands capable of providing a large number of broadband appliances, as well as building highly robust infrastructure for the satellite communications and the development of higher technological infrastructure.

Digital India spirit can be seen in services that have a huge market, not only in the domestic market but also in the global market. It should be clear that government competition in the space industry is not between private sectors.

Mr. Narayan Prasad

In India, the conventional space industry primarily deals with the production of space goods. They have no Intellectual Property Rights. In the majority of cases, they supply ISRO with service support or production support, and products sold locally do not end. They are mainly reliant on ISRO as the only major space customer.

Let us move on to New Space India, these start-ups plan to invest in the production of original space goods, and to provide local and global end-to-end services. They also try to create their own original intellectual property rights, which essentially control the mission part.

Problems faced by Startup Space Industries

Access to directly industrial end-users can stimulate a great deal of investment and can encourage a great deal of end-user operation in the region. Need to open procurement at service level in all government departments. There is still little clarification about the production and deployment of autonomous ground systems in the industry. No clear mechanisms for governments' co-investment. No clear time limit on the supply of Indian satellite system connections to orbital slots license applications. Lack of promotion of startups to reach global markets.

Reforms Needed

The IN-SPACe solves an important problem if the problem includes members of all departments concerned and which departments wish to participate in space regulatory activities. Establish a transparent consulting mechanism for small and large businesses to share their proposals in order to make changes a continuous exercise.

Mrs. Poorvi Kantroo

Liability as a legal challenge in unlocking the private sector in India.

What does liability amount to? When we talk in legal language, why do we want to be responsible? The liability convention fails to define precisely the amount to be taken in order to show just what steps and types of liability are to be demonstrated?

It also highlights that there must be due care taken in the activities which are taken in space. Negligence or a breach of due care is supposed to be a liability.

The financial obligation is protected in Section 440 of the CSLA Regulations. The FAA determines the 'Most likely loss' of covered third-party claims for physical injury and damages caused by property, and the United States, its agencies, its contractors and subcontractors for damages or losses caused by permitted or licensed activities. The amounts for third-party MPLs for each FAA license are established by up to US\$500 million (or 'maximum world market liability insurance at a reasonable cost').

In terms of space operations and privatization, France is another very strong nominee. Article 13 speaks about absolute liability on the grounds that: if any damage occurs in their space it will be considered as absolute and if any damage occurs in outer space that it will be considered as a fault based liability. Looking at the Indian perspective, section 12 of the space bill mandates the administration to compensate the central government subject to the government's decision on a quantum. The government's decision is a very vague word. The issue will arise, how will a private party invest if the provision has no limit on how much liability will be?

At the same time, they will not be given equal representation in the private sector within the bill. It says the whole of the bill is extended to India as a whole. Will a liability be considered when a satellite is thrown into the territorial waters of India? That party could be sued by India. The 'whole of India' should be substituted by India's territory, including air and coastal sea.

Applicability of the bill is an issue, because it's only applicable to Indian Origin.

APPLICATION OF GIS AND REMOTE SENSING TECHNOLOGIES: TRENDS AND PROSPECTS

25th July 2020



NALSAR UNIVERSITY OF LAW

WEBINAR ON JULY 25TH 2020 @17:00 HRS IST

APPLICATION OF GIS AND REMOTE SENSING TECHNOLOGIES: TRENDS AND PROSPECTS

Organized by Centre for Aerospace and Defence Laws (CADL)
www.cadl.nalsar.ac.in



Prof. (Dr.) V. Balakrishna Reddy
Associate, School of Law, Sri Venkateswara Law
School, NALSAR University of Law



Dr. Swarna Subba Rao
Senior Lecturer, School of Law,
NALSAR University of Law



Prof. I. V. Murali Krishna
Professor and Director, IIS and Dr. Raju Mahalingam
PhD, IIS Hyderabad, India



Dr. G. Sreenivasa Reddy
National Director, National Institute of
Remote Sensing Applications (NIRSA)



Dr. Raghunatha Menon K.P.
Group Head, Faculty of Law, NALSAR
University of Law, Hyderabad



Ms. Priya Iyengar
Executive Director, NALSAR University of Law

Can anyone imagine how it would be without the existence of digital maps when you visit a new place or when you want to visit a new place? Most of us would not imagine it. Maps have been the most powerful medium of information and navigation to understand various location parameters across the globe. With the advent of technology, digital maps are widely used and is the common mode of navigation which uses technologies like big data, artificial intelligence, internet of things and other navigation-based technologies.

This spatial component is used in various sectors including the location-based infrastructure, Disaster management, agriculture, environment assessment, health care, e-governance and many more. Research reveals that the global spatial market has an estimated value of USD 78 million, thriving at a CAGR of 16.6% during the assessment period from 2016 through 2022.

With this in mind, CADL, NALSAR University of Law held webinar in "Aerospace and Defence Law Lecture Series" titled "Application of GIS and Remote Sensing Technologies: Trends and Prospects" on Saturday, 25th July 2020 at 5:00 PM IST.

In this webinar, the panel discussed on the issues relating to the application and implementation of GIS and Remote Sensing technologies; Current trends in GIS and Remote Sensing technologies in India, including Urban Mobility; Challenges in Implementation of these technologies; market restraints on technology transfer; and key players in GIS and Remote Sensing Technologies.

Speakers

- (I) Dr. Swarna Subba Rao

- (ii) Prof. I.V Murali Krishna
(iii) Dr. G. Sreenivasa Reddy
(iv) Dr. Raghunatha Menon K.P

Moderator:

Ms. Priya Iyengar

Deliberations by Speaker:

Dr. Swarna Subba Rao

Growth of Geospatial Data:

Geospatial data refers to data surrounding objects, events or phenomenon found on the earth's surface. This may take a static or complex position in the short term (e.g., where a road is situated, a seismic occurrence, children living in poverty) (e.g. a moveable car or pedestrian, disease spread). Slowly the map came into picture, before that people used to visit the sites to analyze the location and gathered the Geospatial Data. Initially GIS was used mostly in topographical experiments. GIS is also used in modelling, infrastructure planning, Disaster Management, engineering data and also Socio Economic Data.

How does GIS contribute to the Global Economy?

GIS has contributed 1trn\$ business sales which are facilitated by digital maps in 2016; \$550bn consumer benefits derived from map services; direct jobs generated by mapping services globally; 5% improvement in revenues and cost savings by companies; 75% sectors representing global GDP directly benefited; 1,686 mn metric tons reduction in vehicular emissions because of digital maps.

Future developments in GIS include: Using 3D GIS to create more nuanced visualizations; Location-based augmented reality applications; Creating navigation

systems for self-driving cars and Mapping indoor environments.

Prof. I.V Murali Krishna

Geospatial Technology- Matters and Concerns

The field of Geospatial Technology is evolving. With the growth of GIS, innovative new technologies and approaches begin to transform the way people use it. Advancement in remote sensing technologies. The GIS programme facilitates the spatial perspective of the variables with graphs and maps to define spatial dependence trends of the observed phenomena. Spatial revolution to High Resolution sensors. Spectral resolution has also evolved from Multispectral to Hyperspectral. Tools of Geospatial analytics, artificial intelligence, deep learning, cloud computing, big data, drones are all becoming an addition to technologies.

Concept on Web GIS: Web GIS consists of at least one server and client where the host is a GIS host and the client is a Web browser, desktop application or smartphone phone. Web GIS can be described as any GIS using web technologies for communication between a server and a customer, in its simplest form.

Space activities and Space Policies can enhance and strengthen the capacity in the management of pandemic situations. In India, the government also proposed a significant change in the privacy sector in space activities such as rocket production, satellite development and the provision of launch services. Issue raised, "Many countries did not permit private sector investment in space until most of the international space treaties were concluded. The private sector has also not been considered. The Indian government would have to explain the effect of foreign treaties on domestic firms by doing private-sector business".

The increasing growth of use of Geospatial Data, Products, Services and Solutions (GDPSS), Govt. of India should promulgate a comprehensive "National Geospatial Policy" to empower the people through geospatial technologies.

Dr. G. Sreenivasa Reddy

The speaker Spoke about the practicality of remote sensing technologies and how it works.

Fault Zones: A fault is a fracture or zone of fractures between two blocks of rock. The optical remote sensing uses the visible spectrum wavelength range (~400–700nm) whereas microwave remote sensing uses the microwave wavelength range of the electromagnetic spectrum, which is further divided into

three parts like near infrared, far infrared and middle IR. Mostly both visible and microwave wavelength ranges are used for analysis as per the requirement. GPR is a geophysical technique that uses radar pulses to image the subsurface. This non disruptive technique is used to detect the transmitted signals from the systems of the underwater and uses electromagnetic radiation in the microwave band (UHF and VHF frequencies). Applications of GPR may involve rock, dirt, ice, fresh water, floorings and structures in a wide range of media.

Surface objects consist of terrain conditions; natural resources; settlements; infrastructures. Subsurface objects consist of; Minerals; Groundwater; concealed pipelines; cables. Spatial data also known as positional data (longitudes and latitudes; x,y or x,yp,z)

Dr. Raghunatha Menon K.P

Technology is a non-linear method capable of modifying the ground rules of economic competition, which provides multiple benefits to society. There are 4 primary types of resolution: the resolution of remote sensed raster data can be characterized in several different ways: (i) Spatial (ii) Spectral (iii) Radiometric (iv) Temporal.

Benefits which are accrued from the geospatial information in terms of customers; processes; outputs and finances. 20 ministries are already involved with ISRO in Space Technology Applications. Earlier technology was primitive in nature. Now all this geospatial technology is converging to a single platform in mobile applications. ISRO Disaster Management Support (DMS) Programmes established a Decision Support Centre (DSC) at National Remote Sensing Sensor (NRSC), ISRO as a delivery point for space and aerial enabled inputs for disaster management.

The ISRO, in collaboration with the ministries and agencies involved, has established a robust DMS (Disaster Management Support) programme. The DMS software includes hurricanes, cyclones, drought, forest fires, earthquakes and disasters. The foundation for timely assistance and emergency relief systems are earth observation satellites along with meteorological and communication satellites and an aerial system.

In order to sustain the country's overall disaster / emergency response period in almost real time, databases are generated by the National Database for Emergency Management (NDEM), a GIS-based data repository. In spatial form as well as in textual form, NDEM shall have core data, hazard-specific data and interactive data. The database allows decision support

systems to be built in the form of custom user interfaces with appropriate security frameworks.

Bhuvan is the national ISRO-based geo-portal of geo-spatial data, research services and software. For example (1), satellite imagery and maps visualisation, (2) analytic (3) collections of free data and (4)

downloaded reports to name a few. This contains many robust applications. The satellite images can be viewed in 2D or 3D, with multi-sensor, multi-platform and multi-temporal images. There are several variations of thematic charts for the study of common themes in natural resources.

INDIA AS A MARITIME POWER: CONTEMPORARY PERSPECTIVES

31st July 2020

NALSAR UNIVERSITY OF LAW
 WEBINAR ON JULY 31st 2020 @17:00 HRS IST
**INDIA AS A MARITIME POWER:
 CONTEMPORARY PERSPECTIVES**
 Organized by Centre for Aerospace and
 Defence Laws (CADL)
www.cadl.nalsar.ac.in

Prof. (Dr.) V. Balakrishna Reddy
 Associate Professor of Law, NALSAR University of Law

Prof. P.V. Rao
 Associate Professor, NALSAR University of Law

Dr. A. Subramanyam Raju
 Professor, Centre for Studies in Maritime Studies,
 School of Law, Economics & Administrative Studies,
 Anna University, Chennai

Commander Uday Rao
 Director General, Coastal Security,
 and a former Director, Indian Coast Guard, Mumbai

Ms. Nimma Divyanshi
 Fellow, NALSAR University of Law

Group Captain Anand Narada Polu
 Director General, Indian Coast Guard, Mumbai

India has a rich history in dealing with sea trade as well as a variety of trading and non-trading practices via sea within and beyond the confines of the country. Hence it has built up a magnificent maritime history and traditions for several decades even much before then the rise of European maritime powers.

At present, among all Asian and African countries, India has one of the largest and considerably well-coordinated merchant shipping fleets with almost ninety per cent of the country's trade volume moved by sea. With one of the largest coastline and having a boundary as sea/ocean, guarding the country through the coast also gains importance.

In short, trade and security through the ocean are prominent in India. Hence from past decades, we have laws which are governing trade and security. With the advancement in trade and an increase in crimes on seas and natural disasters, there are various issues which need to be addressed. To name a few, issues relating to insurance, liability, accidents, pirates etc., are common.

With globalization and Technology-trade prominent era, new areas of concerns have emerged, like ship financing, maritime liens, carriage of goods by sea, ownership and registration of ships, ship sales and building contracts, limitation of liability contracts, the law of collision, salvage, towage and pilotage and its related claims, the law of marine pollution – its consequences and liabilities, customs and port laws are few of them.

That being highlighted in the area of trade-related, there are also new issues and emerging areas in security-related. With the issues of pirates, laws relating to the rights and ownerships for the resources on the high seas and markings of Exclusive economic Zones, Laws related to the passageways of various varieties/registered ships, the trespass of territorial waters, aid by the naval and coast guard forces, Technology used by these forces, rescue operations, access to ports, Laws relating to accidents/attacks on territorial waters, disputes settlement mechanisms for the armed forces, Strategies relating to the security on

the seas etc gained prominence and require intense research and analysis of the same.

With all the contemporary issues, Our panellists in the Webinar “India as a maritime power: Contemporary perspectives”, the last of the “Aerospace and Defence Laws lecture series”, addressed some of them on 31st July 2020 at 5:00 PM.

List of Speakers:

- (i) Prof. P.V. Rao
- (ii) Dr. A. Subramanyam Raju
- (iii) Commodore Udai Rao
- (iv) Ms. Hamsa Devineni

Moderator:

Group Captain Anand Naidu Pola (Retd)

A Brief Introduction of the Webinar by Captain Anand Naidu Pola

In this webinar we will be focusing upon Geo-Political Issues which surround India's maritime forces and maritime economy, Blue Economy, Security Issues in marine forces and Regulatory issues and the conflict of jurisdiction in the Law of the Sea.

Deliberations by the Speakers:

Prof. P.V. Rao

How can naval power be differentiated from maritime power?

Naval power is concerned with warships, submarines, aircraft carriers etc., which is essential for the security of our nation, also known as maritime security. But Maritime Power focuses upon abundant sources of resources available in the Sea. (sagar samudram). India still lacks technological reforms to utilize the living and nonliving resources of the sea. Policy makers in our country still don't have a clear picture of “How to use the sea resources for the economic development of the country.”

“How do we channelize the marine resources for Economic Development”?

SagarMala (also known as National Maritime Development Policy). Related to Ports infrastructure to increase the ability to do exports and imports and to promote a gateway between India and the world.

Purpose of SagarMala Project

- (i) Modernization of Indian Ports.
- (ii) To engage activities in EXIM operations.
- (iii) Make stronger infrastructure of Indian Ports.
- (iv) To make the Indian ports competent enough to handle larger ships.
- (v) To enhance the connectivity between ports and roads; ports and rails; ports and coastal areas and ports and the overseas.
- (vi) To develop port-based coastal industries.
- (vii) To enhance the navigation of cargos in inland waters. (e.g. Ganga, Godaveri) etc.

There should be Foreign Direct Investment in Telecommunication Sectors, Civil Aviation and in Maritime Industries, to uplift the Indian economy.

Dr. A. Subramanyam Raju

Blue Water Economy in India plays a crucial role in Marine Industries. Blue economy is the integration of ocean economy, where the economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy.

Blue Economy Sectors consists of Coastal tourism, Offshore Oil and Gas, Deep sea shipping, Ferry Services, Fisheries, Inland Waterways Transport, Coastal Protection, Offshore Energy, Monitoring and Surveillance, Biotechnology, Desalination, Marine Mining.

India don't have any statistical data regarding the revenue which is generated from the sea. So, how to audit when revenue comes out from the sea?

- (i) SAGAR- Security and Growth for All in the Region.
- (ii) Fisheries is also an important sector in the Blue Economy.

- (iii) Governance at Sea. (Certain pirates extend their operations to over 700 nautical miles in the Indian Ocean Region, whereas the coastal states are subject to EEZ legislation of just 200 nautical miles.)
- (iv) Environmental degradation will not only affect marine ecology but will also affect the lives of fishermen.

Commodore Udai Rao

Maritime Security is all about War fighting, Nuclear capability, Ship building, Ports & Shipping, Trade and Commerce, Protection against maritime Piracy, Protection of Oil and Gas Imports by sea, Protection of Oil and Gas Rigs in EEZ, Protection of Blue Economy, Coastal Security. In India, 120 ships from 20 countries arrive at different ports at any one time.

Piracy Terrorism originated from Somalia (in the year of 2008) and peaked in 2012.

The Anti-Maritime Piracy Bill, 2019 was introduced in Lok Sabha by the Ministry of External Affairs, Dr. Subrahmanyam Jaishankar, on December 9, 2019. The Bill provides for prevention of maritime piracy and prosecution of persons for such piracy related crimes.

The Bill will apply to all parts of the sea adjacent to and beyond the limits of the Exclusive Economic Zone of India. Exclusive Economic Zone refers to the area of sea to which India has exclusive rights for economic activities.

Vulnerabilities (Ports and harbors; Coastal Refineries; Nuclear Power; Naval Bases; Submarines; Shipyards; Cruise Liners; Sriharikota; Wheeler Island)

3 tier Coastal security Framework (consists of the Indian Navy, the Indian Coast Guard and a joint patrol comprised of personnel from the former two as well as from the state police, the customs department and other agencies)

Key Issues Highlighted:

- (i) Governance structure needs to be revamped including the maritime domain. (India can take example from China, Japan)
- (ii) Federal structure creates problems of its own.

- (iii) Some States have yet to set up Maritime Boards.
- (iv) Capacity and capability building of maritime neighbors: Seychelles, Mauritius, Maldives, Sri Lanka.
- (v) Maritime courts are needed.
- (vi) Setting up a National Maritime Authority.
- (vii) To enhance maritime cooperation and information sharing with friendly countries.

Ms. Hamsa Devineni

Maritime territorialization: the term "maritime territorialization" refers to the ways in which states treat the sea as "land", and the activities that states undergo to "perform" sovereignty in territorial seas and islands. America follows the naval strategy "a naval strategist and the author of The Influence of Sea Power Upon History, argued that national prosperity and power depended on control of the world's sea-lanes. "Whoever rules the waves rules the world," Mahan wrote."

Satellite imaging in recent years has shown that China is stepping up its efforts to recover lands in the South China Sea through the physical growth of islands and creation of new islands. 90% of the South China sea is being claimed by China based on Historic rights, that it belongs to China solely.

Why is the South-China Sea important? One-third of the world's maritime shipping passes through it, carrying over USD \$3 trillion in trade each year. Secondly, huge oil and natural gas reserves are believed to lie beneath its seabed.

Where does India fit in a global race? (Analysis)

India has been very committed from the beginning to the international rule of law. It has been a strong supporter of International Maritime space order to govern the oceans.

Italian Marine case (Enrica Lexie Incident)

Facts:

The event took place on 15 February 2012, on the way to Djibouti, on MV Enrica Lexie, an Italian flagged vessel, and encountered St Antony, an Indian fishing vessel. Enrica Lexie sailed on board with an Italian Department of Military Security whose job was to defend the boat against a piracy attack. When a piracy attack was

mentioned in the "Mercury Chat," it was sailing near the Indian border in the Indian Contiguous Zone.

The marines mistook St. Antony as a pirate ship. At 20.5 nautical miles from the seashore they killed two Indian fishermen. The Italian ship was contacted by the Mumbai Maritime Rescue Coordination Centre, which ordered the ship to return to the port of Kochi to assist in the enquiry into the incident, about 38 nautical miles off the high sea. Enrica Lexie changed course to respond to the message and returned to the port of Kochi on 16 February 2012. During the docking of the vessel at Cochin, the vessel master was told of the first report on the incident involving the firing of two Indian fishermen.

Objections raised by Italy:

- (i) India doesn't have jurisdiction, as the incident occurred beyond territorial waters of 12 nautical miles from the Indian Coastline.
- (ii) Italian Navy Officers, who shot two Indian fishermen were performing their duty hence they enjoyed immunity from prosecution.

This case was transferred to the International Arbitration Tribunal. This shows how India respects the International rule of Law. India is now pursuing its regional and international partnerships, both diplomatically and militarily with neighboring nations to enhance equitable governance of the global maritime domain.

The Admiralty (Jurisdiction and Settlement of Maritime Claims) Act, 2017 has been enacted. Currently admiralty jurisdiction applies to the Bombay, Calcutta and Madras High Courts. The Act further extends this to the High Courts of Karnataka, Gujarat, Orissa, Kerala, Hyderabad, and any other High Court notified by the central government.



WEBINAR SERIES ON SCOPE AND OPPORTUNITIES IN AVIATION, DEFENCE, SPACE, MARITIME AND REMOTE SENSING SECTORS.

As part of Academic Social Responsibility, the Centre for Aerospace and Defence Laws (CADL), NALSAR University of Law, Hyderabad has conducted its second edition of webinar in Aviation, Space, Defence, Maritime and Geospatial Laws. The theme of the second edition is the scope and opportunities in the Aviation, Defence, Space, Maritime and Remote Sensing sectors. In this exclusive five day series, the distinguished speakers highlighted the scope in the Aviation, Defence, Space, Maritime and Remote Sensing/geospatial sectors and also the requirement and need for the legally knowledgeable persons. This webinar series also highlights the M.A and Advanced Diploma courses offered by the NALSAR University of Law. Each webinar had the attendance of more than 200 participants, which shows the success and the interest of the candidates in the Aviation, Defence, Space, Maritime and Geospatial sectors.

Brief Introduction:

India's Aerospace and Defence sector is in transition of being a self-reliant Industry. With the encouragement of the government, and the participation of Private Companies, the sector's ecosystem is in process of steady development. However, there is a constant requirement of collaboration between the R&D and the Industries as the technology needs and advancement is drastic.

The Aviation sector has been the worst hit sector due to the Covid. This has led to the various problems in Human Resources, Airports, Airline companies. The lawyers and legal experts in this sector were given huge tasks of modifying contracts, to find the way-outs in the existing contracts. The economy is bleak. However, such challenging situations have welcomed many opportunities to many skilled employees. The need for collaboration and interaction between the various departments in the sector is identified.

Foreign Direct Investment (FDI) equity inflow in the defence sector for April 2020 - March 2021 stood at US\$ 10.15 million (Rs. 61.52 crore) as per data released by the Department for Promotion of Industry and Internal Trade (DPIIT). In June 2021, Defence Minister, Mr.

Rajnath Singh, approved a proposal for the construction of six submarines at an estimated cost of ~ Rs. 43,000 crore (US\$ 5.76 billion). He also approved proposals regarding capital acquisitions of several equipment for modernisation and operational requirements at an estimated cost of ~ Rs. 6,000 crore (US\$ 803.91 million). Government formulated the 'Defence Production and Export Promotion Policy 2020' to provide impetus to self-reliance in defence manufacturing under the 'Aatmanirbhar Bharat' scheme. The ministry aims to achieve a turnover of Rs. 1 lakh 75 thousand crore (US\$ 25 billion), including an export of Rs. 35 thousand crore (US\$ 5 billion) in the aerospace and defence goods and services by 2025. The government has started many other initiatives to encourage the start-ups, MSMEs, to achieve the 'Aatmanirbhar Bharat' goal. These developments enable the requirement of the specialised personnels in the sector.

In order to enhance the diffusion of space technology and boost space economy within the country, the Department of Space (DOS) is encouraging the participation of private companies in space activities. ISRO is complementing DOS in its objective of opening up the space sector to private industries. This enables new opportunities in the sector. Also, Space based applications/ services over the years have grown in multitudes than originally envisaged. Many new applications are being developed world wide to meet the growing user demands and requirements. The activities are on a growth trajectory with huge commercial potential. In India, many Non-Government-Private-Entities (NGPEs) have started engaging in space activities for commercial gains. Many start-ups and industries have started making launch vehicles and satellites and are eager to provide space based services. Participation of NGPEs including academic institutions, start-ups and industries in end-to-end space activities is expected to expand the space economy.

According to the Ministry of Shipping, around 95% of India's trading by volume and 70% by value is done through maritime transport. India has 12 major and 205 notified minor and intermediate ports. Under the National

Perspective Plan for Sagarmala, six new mega ports will be developed in the country. The Indian ports and shipping industry play a vital role in sustaining growth in the country's trade and commerce. The Indian Government plays an important role in supporting the ports sector. It has allowed Foreign Direct Investment (FDI) of up to 100% under the automatic route for port and harbour construction and maintenance projects. It has also facilitated a 10-year tax holiday to enterprises that develop, maintain and operate ports, inland waterways and inland ports. India's key ports had a capacity of 1,534.91 million tonnes per annum (MTPA) in FY20. In FY21, all key ports in India handled 672.60 million tonnes (MT) of cargo traffic. In June 2021, the Ministry of Ports, Shipping and Waterways and Ministry of Civil Aviation signed a memorandum of understanding (MoU) to develop seaplane services in India. The demand in the maritime and shipping sector, paves the way for the new opportunities.

Centre for Aerospace and Defence Laws (CADL), NALSAR University of Law has come back with the webinar series on the Scope and Opportunities in Aviation, Defence, Space, Maritime and Remote Sensing sectors. This series will critically examine the scope and future opportunities of the Aviation, Defence, Space, Maritime and Remote Sensing sectors.

Webinars:

All the sessions are moderated by the Grp. Capt. Aanand Naidu Pola, Former Addl Director General DD & AIR and Adjunct Professor, NALSAR University of Law and had provided insightful information.

On the first day of the series, Mr. Sagar Singhamsetty, Founder and Managing Director, Aerospace and Aviation Lawyers Association of India (AALAI) and also Adjunct Faculty, Center for Aerospace and Defense Laws (CADL), NALSAR University of Law had highlighted the Scope and Opportunities in Aviation Sector. He had briefed the International Air Law and also highlighted the fast growing nature of the Aviation Industry. He emphasized that the huge investments are taking place in the Airline Industry and also many private companies are coming up to establish business in MROs, Drones, Helicopter manufacturing units, Aviation Flying Academies, Training Institutions, Tourism Agencies etc. Further he elaborated the FDI policies in

the Aviation sector and its allied industries, New Drone policies, Aviation Safety and security, Aircraft leasing, Aviation agreements and also employment opportunities in these Industries.

The second day of the series had attracted an outstanding response from the participants. The Speaker of the session, Lt Gen A V Subraamanian (Retd), Chairman of SIDM R&D and Technology Committee, Former Director General of Weapons and Equipment at IHQ (Army) had elaborated the scope and opportunities in the Defence Sector. He began by saying that India is going to be one of the superpowers soon. He emphasised that through Atmanirbar Bharat initiative India is moving towards self-reliance and also came up with the innovative equipment to combat the covid situations. He elaborated on contemporary issues like defence acquisitions, Inspection and monitoring in defense procurements, coordination, cooperation within departments, Higher Defense Administration, offset policies etc. He further explained the Rafeal deal, Multilateral export control regimes, defence start-up ecosystem, etc. He also stressed the importance of Research and Development in PSUs and also for strengthening the effective Defense operations in terms of Security of the Nation. He also highlighted the need for the legal expertise and knowledge in the defence acquisition, procurement, exports and imports for the defence modernisation.

The maritime industry is one of the largest and fastest-growing industries globally. Given the surge in demand for marine services, there has also been a substantial increase in career opportunities in the sector. Hence, on the third day in the series, Prof. (Dr). P.V. Rao, Visiting Faculty, and former Director of Centre for Indian Ocean Studies, Osmania University had elaborated the opportunities in the maritime sector. He had discussed the "Sagarmala project" and his involvement in it. He also emphasized on the dependence of India's international trade on the ports and shipping Industry. Prof. Rao also said that the maritime industry offers a wide range of career opportunities, the number of people opting for a career in the sector is receding somewhat. Hence, it is becoming crucial to retain and attract talented employees in the various sectors of the maritime industry.

On the fourth day i.e. on 16th September, 2021, the speaker, Mr. K.R. Sridhara Murthi, Director, International Institute of Aerospace Engineering and Management, Jain University, Bangalore had elaborated on the scope and opportunities in the Space Sector. During his talk, he briefly discussed India's space journey from October 7, 1957 till date including its activities and achievements in the space sector. He also elaborated on commercialization of the space sector, usages of space activities in different sectors like education, environment, commercial purposes, internet facilities, technological advancement systems, and how these can enhance the national economy. He emphasised that space technology and law are two sides of the same coin. He further discussed the need for space reforms in the private sector, Space infrastructure and facilities provided by NGPES. He also elaborated on the Technology Transfer Guidelines, Draft of Space Activities Bill, Micro/ Nano Satellite Growth rate, Space tourism, Space Insurance, Asteroid exploration, Space Startup companies across the country and employment opportunities in these sectors.

The last day of the series had distinguished speakers like Dr. Swarna Subba Rao, Former Surveyor General of India and Adjunct Professor, CADL, NALSAR University

of Law, Maj general Dr. R Siva Kumar (Retd), President IIC Technologies, Director, Open Geospatial Consortium Inc. The speakers had remarked that Remote Sensing and GIS is a booming technology in the Indian market. It has great scope in both the government and private sector. They further said that, In case of the government sector, each and every planning is dependent on spatial analysis. Projects like smart cities, property mapping will provide a big window for GIS people. While the private sector has started using location based services like Amazon, Flipkart, BigBasket and food providing services are grooming.

They briefly discussed the relevance of geospatial data and its use in topographical experiments. They elaborated the usage of GIS in modelling, infrastructure planning, Disaster Management, engineering data and also Socio Economic Data. They also discussed the increased use of geospatial technology in different industries has improved the scope of job opportunities in GIS and Remote Sensing. Every area ranging from missile and unmanned aerial vehicle technology to urban administration, e-governance, remote sensing and even advertising and marketing today depend on geo-spatial data.

Webinar

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Scope and Opportunities in Aviation Sector

13th September, 2021



Mr. Sagar Singamsetty, Founder and Managing Director, Aerospace and Aviation Lawyers Association of India (AALAI) and Adjunct Professor of Law, CADL, NALSAR University of Law

Recent Developments in Aviation Industry²:

Air transportation is growing increasingly accessible and desirable thanks to an interconnected global community and a thriving tourism sector combined with a strong safety record. The industry employs an estimated 65.5 million workers globally, with 10.8 million of those jobs being indirect suppliers to the aviation industry, such as parts manufacturers. According to the International Air Transport Association (IATA), air travel worldwide will double to 8.2 billion travellers in the year 2037, largely as a result of airlines taking advantage of the current aviation industry trends. Despite the latest trends driving industry growth, the aviation industry as a whole will also need to focus on how to continue to meet these demands while adhering to increasing safety and environmental regulations and battling geopolitical turbulence.

The Future of the Airline Industry 2035 study commissioned by IATA's Industry Affairs Committee aims to help airlines and other key aviation stakeholders anticipate the key risks and opportunities that their

businesses could face between now and 2035. Geopolitics to technological innovation and environmental concerns—could shape aviation's future. The good news is that, while the future is unpredictable, there are steps we can take to be better prepared for what it may bring. The aviation industry is a massive global economic contributor, supporting millions of jobs and transporting billions of passengers. It's laid the groundwork for some of history's most important technological, design and engineering breakthroughs. Despite ongoing challenges the airlines face operationally, the future of aviation will see the industry continue to adapt and find innovative solutions in the areas of technology, environment and safety.

Few Future Trends in Aviation Includes: Servicing Niche Markets, Fuel Efficiency and Environmental Protection, Steady Job Growth; Implementing Passenger Biometrics, Cockpit Connectivity, Aviation Safety and Smart Maintenance, Aviation Standards and Testing, Hubs And Smaller Airports, Workforce And Skills.

Other recent trends are visible in the adoption of newer technologies as well. With new, narrow-body planes offering more fuel efficiency, the low-cost carrier model may sustain itself further. Moreover, the government is now considering providing internet access during flights.

Airports and airlines are coordinating with each other while adopting blockchain in cargo and baggage tracking, passenger identity management, and smart contract applications. Further, customer redressal services have also been improved with the DGCA ordering digitization and increased accessibility.

The DGCA had asked airlines to address social media complaints, ensure timely refunds and text-message passengers periodically about delays and gate changes. With the building of more airports, issues regarding providing specific time slots to airlines would also arise.

Hubs and Smaller Airports

High-speed trains are likely to take business from airlines over shorter distances. Some new technologies, if they prove viable, may also compete on performance by providing faster connections over longer distances

² <https://www.ibef.org/industry/indian-aviation.aspx>

References: Media Reports, Press Releases, Press Information Bureau, Directorate General of Civil Aviation (DGCA), Airports Authority of India (AAI), Union Budget 2021-22

(e.g. hyperloop, drone companies, unmanned aircraft companies, and private actors such as SpaceX). As this happens, the role of airlines may shift to long-haul international flights, making relationships with other transport providers more important. At the same time, there may be a shift towards more point-to-point travel. Secondary and tertiary airports may benefit from efforts to combat increasing congestion at hubs.

The sector should take a more holistic approach to infrastructure development and establish closer relationships with providers that are not just focused on air transport infrastructure (e.g. urban planners). IATA could help develop relationships with 'new' forms of transport. Options include partnerships and development of shared infrastructure to boost passenger flows, as well as improving connections between different modes of transport. This would improve access to airports in large population centers, and direct connections with such locations will enable faster and more efficient growth in connectivity.

Workforce and skills:

Aviation depends on high-skilled employees, whether pilots, engineers, air traffic controllers, or safety inspectors. In the medium term there may be skill supply issues due to the increased demand from emerging markets. In the longer term, we may see more fundamental changes to the nature of work. Recently, there are shifts towards on-demand work, taking advantage of new technologies to allow people to work when and where they want.

Indian Scenario

India presently has 464 airports and the plan is to expedite development of Airports in the country with the goal of opening 100 new airports by the year 2024. In fact, a vision document released by the Ministry of Civil Aviation in January, 2020 suggests that there will be around 200 new airports in India by 2040. India has become the third largest domestic aviation market in the world and is expected to overtake UK to become the third largest air passenger* market by 2024.

Market Size

India is expected to overtake China and the United States as the world's third-largest air passenger market

in the next ten years, by 2030, according to the International Air Transport Association (IATA).

India's passenger* traffic stood at 115.37 million in FY21. Domestic passenger and international passenger traffic declined at a CAGR of -9.02% and -28.64%, respectively, from FY16 to FY21, owing to COVID-19-related restrictions on flights in FY21. In FY21, airports in India pegged the domestic passenger traffic to be ~105.2 million, a 61.7% YoY decline, and international passenger traffic to be ~10.1 million, an 84.8% YoY decline, over the fiscal year ended March 31, 2020. In September 2021, the average daily domestic passenger flight departures stood at 2,100.

Between FY16 and FY21, freight traffic declined at a CAGR of -1.77% from 2.70 million tonnes (MT) to 2.47 MT. Freight traffic on airports in India has the potential to reach 17 MT by FY40.

Aircraft movement declined at a CAGR of -7.79% from 1.60 million in FY16 to 1.20 million in FY21. From FY16 to FY21, domestic aircraft movement decreased at a CAGR of -6.44% and international aircraft movement declined at a CAGR of -18.52%. India's domestic and international aircraft movements reached 1,062 thousand and 135 thousand, respectively, in FY21. The expenditure of Indian travellers is expected to grow to Rs. 9.5 lakh crore (US\$ 136 billion) by 2021.

To cater to the rising air traffic, the Government of India has been working towards increasing the number of airports. As of 2020, India had 153 operational airports. India has envisaged increasing the number of operational airports to 190-200 by FY40.

Further, the rising demand in the sector has pushed the number of airplanes operating in the sector. The number of airplanes is expected to reach 1,100 planes by 2027.

Investment

According to the data released by the Department for Promotion of Industry and Internal Trade (DPIIT), FDI inflow in India's air transport sector (including air freight) reached US\$ 3.06 billion between April 2000 and June 2021. The government has allowed 100% FDI under the automatic route in scheduled air transport service, regional air transport service and domestic scheduled

passenger airline. However, FDI over 49% would require government approval.

IndiGo signed an agreement to investigate the possibility of using sustainable fuel in planes in July 2021.

Raghu Vamsi plans to build a US\$ 15 million facility in Hyderabad to meet Boeing's needs as of August 2021.

In August 2021, SpiceJet will introduce 16 new flights.

Rare Enterprises, in partnership with former CEOs of IndiGo and Jet Airways, plans to start an ultra-low-cost airline to capitalise on the domestic air travel demand in 2021.

India's aviation industry is expected to witness Rs. 35,000 crore (US\$ 4.99 billion) investment in the next four years. The Indian Government is planning to invest US\$ 1.83 billion for development of airport infrastructure along with aviation navigation services by 2026.

Key investments and developments in India's aviation industry include:

- In October 2021, Tata Sons won the bid to acquire state-run Air India by offering Rs. 18,000 crore (US\$ 2.4 billion) to acquire 100% shares.
- In October 2021, Akasa Air, a start-up airline, received a 'No Objection' certificate from the Ministry of Civil Aviation to launch operations. The start-up plans to commence its operations from mid-2022.
- In September 2021, JetSetGo, a private aviation company, plans to make its flight operations carbon neutral by 2024 through a carbon management programme.
- In August 2021, Indira Gandhi International Airport was declared the best airport in India and Central Asia at Skytrax World Airport Awards.
- In June 2021, SpiceJet announced its ambitious target to fly 100 million domestic passengers on Sustainable Aviation Fuel (SAF) blend by 2030 under the aegis of World Economic Forum (WEF).
- In April 2021, Boeing, an aircraft manufacturer, announced that it has partnered with the Indian Aviation Academy (IAA) and the University of Southern California (USC) to conduct safety

management system training sessions for all stakeholders in the domestic aviation industry.

- In March 2021, the Indira Gandhi International (IGI) Airport in Delhi announced a key expansion project to increase its passenger handling capacity. The expansion project includes a new terminal, advanced facilities, an additional runway and improved capacity to handle more passengers.
- In March 2021, the government announced plans to set up two water aerodromes in Assam and four water aerodromes in Andaman & Nicobar Islands this year to boost tourism and connectivity.
- In March 2021, the government submitted a proposal to develop a water aerodrome project at the Ujjani Dam, under the Ministry of Civil Aviation's UDAN-RCS (regional connectivity scheme).
- On March 25, 2021, Union Minister of Civil Aviation Hardeep Singh Puri inaugurated the Kurnool Airport, Orvakal, Andhra Pradesh, in a virtual ceremony. The flight operations at Kurnool airport will commence on March 28, 2021 under the Regional Connectivity Scheme – Ude Desh Ka Aam Nagrik (RCS-UDAN).
- On February 25, 2021, the Airports Authority of India (AAI) issued tenders for construction of the first phase of an international airport at Dholera in Gujarat, entailing an investment of Rs. 987 crore (US\$ 135.07 million). The new facility is being set up in greenfield city under the Delhi–Mumbai Industrial Corridor (DMIC) project at Dholera.
- On January 19, 2021, the Airport Authority of India (AAI) signed a concession agreement with Adani Group for three airports—Jaipur, Guwahati and Thiruvananthapuram. The concession period is 50 years from the date of commercial operations.
- AAI plans to invest Rs. 25,000 crore (US\$ 3.58 billion) in the next five years to augment facilities and infrastructure at airports.
- UK group to invest Rs. 950 crore (US\$ 135.9 million) in Turbo Aviation's new airline TruStar.

Government Initiatives

Some major initiatives undertaken by the Government are:

- The Ministry of Civil Aviation (MoCA) announced that airlines can operate domestic flights without any capacity restriction, effective from October 18, 2021.
- On October 20, 2021, Prime Minister Mr. Narendra Modi inaugurated the Kushinagar International Airport in Uttar Pradesh. The international airport is likely to facilitate the air travel requirements of international Buddhist pilgrims in India.
- In August 2021, the government plans to implement a biometric boarding system using facial technology in six airports, including Bengaluru, Hyderabad and Pune. The project is currently in the testing phase.
- The Ministry of Civil Aviation (MoCA) increased the capacity of domestic flights to 65%, from 50%, effective from July 05, 2021.
- The Ministry of Civil Aviation (MoCA) is hopeful that aspiring commercial pilots will soon be able to get trained in India without having to leave the country. In this regard, the government in July 2021 announced setting up eight new flying academies across the following five airports: Belagavi and Kalaburagi in Karnataka, Jalgaon in Maharashtra, Khajuraho in Madhya Pradesh, and Lilabari in Assam.
- On May 08, 2021, AAI commenced commercial operations at Rupsi airport—Northeast India's 15th airport and Assam's 7th airport.
- In March 2021, on the launch of the 'Azadi Ka Amrit Mahotsav (India@75)' by the Government of India, the Ministry of Civil Aviation (MoCA) proposed 392 routes under the UDAN 4.1 bidding process.
- The Airport Authority of India plans to abolish royalty and offer steep discounts in lease rent to encourage MRO units to set up facilities at its airports.
- The government is planning to start 14 more water aerodromes across the country, after the successful launch of seaplane service by Prime

Minister, Mr. Narendra Modi, between the Statue of Unity near Kevadiya in Gujarat's Narmada district and Sabarmati Riverfront in Ahmedabad in October 2020.

- In November 2020, the Government of India announced that it is likely to increase the total number of allowed domestic flights to 75% of the pre-COVID-19 levels, as it expects a rise in passenger numbers due to the festive and holiday season.
- In September 2020, the Government of India sanctioned Rs. 108 crore (US \$ 14.73 million) for Jagdalpur, Ambikapur and Bilaspur airports in Chhattisgarh under the UDAN scheme for upgrade and development.
- Under Union Budget 2021-22, the government lowered the custom duty from 2.5% to 0% on components or parts, including engines, for manufacturing of aircrafts by public sector units of the Ministry of Defence.
- Under Union Budget 2021-22, the Indian government expanded the scope for 'Krishi Udaan' in convergence with Operation Green Scheme, wherein air freight subsidy of 50% for agri-perishables would be provided to North East states and 4 Himalayan states/UTs. The expansion of product-coverage will boost the 'Krishi Udaan' scheme and improve air cargo transportation from these states.
- In February 2019, the Government of India sanctioned the development of a new greenfield airport in Hirasar, Gujarat, with an estimated investment of Rs. 1,405 crore (US\$ 194.73 million).
- Regional Connectivity Scheme (RCS) has been launched.

Achievements

Following are achievements of the Government:

- 3,13,668 domestic passengers flew on February 28, 2021—the highest number since resumption of domestic flights on May 25, 2020.
- Under the RCS-Udan scheme, approximately 34,74,000 passengers were flown and 335 routes

were awarded during 2019, covering 33 airports (20 unserved, 3 underserved, 10 water aerodromes).

- As of December 31, 2020, ~31 lakh Indians have been repatriated under the Vande Bharat Mission (VBM). The VBM has so far involved 6,373 Air India flights and 474 flights by private Indian carriers. About 1,035,471 Indian nationals have been repatriated by Air India, whereas 74,675 Indian nationals have been brought back by private carriers.
- In April 2020, the government introduced the 'Lifeline Udan' flights to transport essential medical cargo to remote parts of the country to support India's war against COVID-19. Under this scheme, about 600 flights flew more than 5 lakh kms and transported about 1,000 tons of essential cargo.

Road Ahead

India's aviation industry is largely untapped with huge growth opportunities, considering that air transport is still expensive for the majority of the country's population, of which nearly 40% is the upwardly mobile middle class.

The industry stakeholders should engage and collaborate with policy makers to implement efficient and rational decisions that would boost India's civil aviation industry. With the right policies and relentless focus on quality, cost and passenger interest, India would be well placed to achieve its vision of becoming the third-largest aviation market by 2020. The expenditure of Indian travellers is expected to grow up to Rs. 9.5 lakh crore (US\$ 136 billion) by 2021. Due to rise in demand in air travel, India will need 2,380 new commercial airplanes by 2038.

CAREER OPPORTUNITIES IN AVIATION INDUSTRY

Civil aviation has become a major industry in our time. Without air travel, mass international tourism would not exist, nor could global supply chains function. Some 40 percent of high-tech sales depend on good quality air transport, and there is no alternative mode of transport for perishable commodities such as fresh food or cut flowers. Air transport systems are interdependent, involving airlines, all service providers and authorities on the ground.

Civil aviation has several distinct features. First, it is a truly transnational industry but still firmly anchored to countries. States often take pride in their national carriers. Secondly, it is highly regulated internationally and nationally: in part to maintain safety and security but also for economic and political reasons. Thirdly, deregulation of the industry since the late 1970s has led to differentiation among various categories of airlines. Fourthly, the job market in civil aviation is highly segmented, with wide differentiation of job profiles. These distinctions between occupational groups are also reflected in industrial relations throughout the industry. With the Asia Pacific region emerging as the pivot of the world, the aviation industry in India is poised for takeoff.

When asked to make a list of airline jobs, most people instantly think of pilots. But the flight crew, while their jobs are definitely important, are only a small part of what keeps an airplane flying and flight schedules on track. Airlines rely on many individuals to perform their job in order to keep them in business. They include baggage handlers, ticket agents, and avionics technicians.

If a person has a scientific bent of mind, he can opt for a career as a Pilot, Aircraft Maintenance Engineer, etc. and if a person is good at communication and interpersonal skills, she/he can consider a career as an Air Hostess or a Flight Steward. Good managerial skills can land you a job in management of airports or airlines and good PR Skills can help you secure a job in customer relations department. Great organizational skills and ability to think on toes can make you an asset for a ground job.

With the privatisation and foreign collaboration increasing everyday, the future is very bright in the Aviation sector. Most airline offices are looking to increase their fleet and this itself is opening avenues for the aspirants.

Besides Indian Airlines, there are several private airlines like Jet Airways, Sahara, Air Deccan, Kingfisher, currently expanding their fleet and range of operations in India. There are several other international airlines that operate through India like United Airlines, Air Canada, Virgin Atlantic, Qantas, KLM, Lufthansa, United Airlines, Cathay Pacific, British Airways, Thai Airways,

Malaysian Airlines and China Airlines to name a few.

Many airline jobs are well paying and offer prestige as well as excitement and fantastic benefits. The following are few benefits of job in aviation industry:

- Sick pay
- Vacation pay
- Comprehensive medical
- Dental
- Vision
- Prescription insurance plans
- Basic life insurance
- Basic accidental death & dismemberment coverage
- Flexible spending accounts
- Retirement plan
- Free airfare for employee and his or her immediate family on company airline
- Discounted airfare for employee and his or her immediate family on other airlines.

DIVERSE CAREER OPPORTUNITIES IN AVIATION

Airline Administrative Support

Every airline, big and small, needs administrative support staff to keep the office running smoothly. These positions include secretaries, data entry workers, receptionists, communications and PR specialists, and those who work in the human resources department who handle or oversee the hiring, labour relations issues, training, and termination of employees.

Operations Agent

Also known as an Airline Operations Agent, the cargo agent needs great communication skills for receiving and transmitting information from and to pilots, ground crew, and other personnel. The Ops Agent must be able to prioritize a large number of projects and tasks. When flights are overbooked, agents must make decisions to rectify the situation in a way that will not negatively impact the schedule.

Avionics Technicians

Avionics technicians specialize in working on the electronics systems of aircraft. Avionics technician jobs involve troubleshooting, repairing, replacing, and installing avionic equipment. Calibration of the equipment may also be required.

Regional Sales Manager

The airline district sales manager oversees all of a district's reservations and ticket sales offices, and the sales representatives in that district. Sales representatives promote their airline in an effort to sell cargo space and plane tickets.

Flight Dispatcher

Flight dispatchers are responsible for ensuring the safety of an aircraft's flight. This includes preparing a flight plan, which is a detailed schedule of destinations, layovers, distance, expected fuel consumption, winds aloft, weather, altitude, compass bearing, and alternate destinations in case of problems.

Ground / Airport Station Attendant

This position has many names: airline informational representative, ground attendant, station attendant, special assistant coordinator, or airport informational representative. Regardless of title, the main responsibility is to assist passengers in the terminal with general questions regarding directions, terminal services, or arranging wheelchair access.

Aviation Meteorologist

Aviation meteorologists provide weather information to airline flight dispatchers and pilots. They must determine current and forecasted weather conditions for all altitudes, including the direction and speed of wind, cloud cover, and precipitation.

Passenger Service Agent

Passenger service agents have some of the same responsibilities as those in station agent jobs, but they are focused on working passengers - not aircraft. Their duties include issuing refunds to passengers, computing fares, preparing and selling tickets, collecting charges for excessive baggage, checking baggage, and providing travel information.

Ramp Planner

An airline ramp planner is responsible for knowing the arrival and departure times for each of the airline's aircraft at that airport. He or she coordinates a variety of departments or contracted companies that must perform various tasks on the aircraft before it can depart for the next flight.

Reservation Sales Agent

Reservation sales agents provide travel information over the telephone to customers of the airline. Typically, this information includes trip planning, car rentals, seat availability, fare information, schedules, tours, meals, and other information relevant to the customer's flight plans. Although internet reservations have skyrocketed, airlines still utilize reservation sales agents.

Sales Representative

Airline sales representatives help generate business for the airlines. They promote their airline to businesses.

Crew Schedule Coordinator

Airline crew schedule coordinator is responsible for staffing of aircrew and ground support to keep flights on schedule. If weather or mechanical difficulties delay a flight, it is the crew scheduler's responsibility to make sure schedule adjustments are made so that travellers arrive at their destination on time.

Airline Station Agent

The most important duty of the station agent or district operations manager is ensuring the overall operations of a given airline at an airport. This encompasses both flight and ground support operations and involves coordinating flight crew, cargo crew, baggage crew, ground crew, and the information that must be communicated among all these teams.

Airline Ticket Agent

Ticket agents work at an airline's ticket or baggage counter. They greet customers when they arrive at the airport. They check in luggage and make seat assignments. They also handle airline ticket sales, reservation changes, and provide information on aircraft boarding.

Airline Flight Instructor

An airline flight instructor provides recurrent training for the airline's pilots. Airline flight instructors may be senior pilots who fly for the airline.

Aviation Attorney

Aviation attorneys specialize in aviation-related cases in commercial or general aviation for individuals, government agencies, or companies. Aviation attorneys represent airlines and/or the government. Some aviation attorneys work for the FAA, while others may be on staff or on retainer by large corporations who own aircraft or deal with airlines.

RECRUITMENT IN THE AVIATION INDUSTRY IS ON RISE

Entry of new carriers, addition of more routes by global players, mushrooming of new airports and modernisation of old ones has opened up employment opportunities in the industry. The recruitment trend that we see in the Indian airline market is due to individual business plans of some airlines, primarily IndiGo which is adding more capacity than its rivals. Recruitment by foreign carriers shows the immense potential for our human resources, especially in the hospitality sector. Choosing the right crew and training them are key for airlines because in an industry where all airlines offer the same set of fares, the service quality can be the only differentiating factor.

Growth in air traffic in India has slowed down considerably over the past few years. Airlines flew 6.02 million passengers in May, up 8% from a year earlier, show data from industry regulator Directorate General of Civil Aviation. Traffic during the January-May period grew a mere 3%. But airlines have been adding flights, anticipating a pickup in demand.]

Airbus has raised its projected number of aircraft purchases over the next 20 years by nearly 1,000 - now anticipating demand for nearly 26,000 new passenger and cargo planes. The company has estimated that 15,000 of these will be extensions to current fleets, which will create a significant rise in the number of flight crew jobs and maintenance jobs needed to staff them. The company has predicted that the rise in fleet numbers will prove particularly lucrative to pilots, with each additional airliner to the world fleet creating 10 to 14 pilot jobs. Airbus said the most significant growth will be seen in the Asia Pacific region, with one third of all worldwide passenger traffic generated from the area by 2029.

The growth in demand for airliners is, in turn, expected to support a boom in aviation and flight schools. Aviation is forecasted to expand strongly in the next two decades. Passenger numbers are predicted to increase from 2.7

billion in 2010 to 5.9 billion in 2030. Aircraft movements are predicted to double, from 26 million to 48.7 million. Assuming that the traffic estimations come true, the number of direct jobs is set to increase from 8.36 million to 12.1 million.

CURRENT JOB OPENINGS IN INDIAN AVIATION

Airports Authority of India

Just recently, the Airports Authority of India has notified for nearly 300 positions, both horizontal and vertical, for a diverse variety of jobs in the field of

- Company Secretary
- Commercial
- Law
- Airport Operations
- Finance
- IT
- Human Resource
- Cargo
- Economic Planning
- Public Relations
- Architecture
- Technical and Fire Services

Each of these sectors further requires employees in the level of Managers, Deputy Managers and Junior Executives. Their remuneration is equally high starting from 6.5 lakhs per annum to 10 lakhs per annum.

GMR Airports

GMR Airports is currently calling applications for various managerial positions like Associate Managers, Senior Coordinator, Manager HR and Coordinator.

IndiGo

Recently, one of the most popular air carriers of India has announced its target to purchase over 600 aircrafts in the next five years. If each aircraft requires nearly 100 people for maintenance, then nearly 60000 jobs are waiting for skilled aviation professionals

Indigenization of the MRO Industry

One of the prime focuses of the Indian civil aviation policy is to indigenously develop the MRO industry for aviation. Since at present we are outsourcing our MRO requirements, we are on an annual basis losing out on nearly 700 billion dollars. Once the MRO industry is set up in India and is functional, generation of aviation employment will increase by many folds.

CONCLUSION

Career opportunities in the aviation industry are extensive and promising. After the completion of your course, based on your skills and interests, you can choose to take up a career in verticals like marketing, human resource management, operations, logistics and air traffic control. But as you progress in your career, you would be expected to wear different hats. So if you want to grow consistently in the aviation industry, you have to understand the functioning of various departments of the industry and pick up cross-functional skills.

Employment opportunities for aviation managers are in airports, airlines and airfreight service providers. Apart from this, you can fit into jobs in fields like tourism, hospitality, transportation and retail.

Based on the job role you assume, you will be responsible for tasks like management of commercial airports, business analysis, personnel and labour relations, civil engineering, design and implementation of safety programmes, enforcement of airport rules and regulations, and logistics and supply chain management.

To succeed in this field you will need to have strong technical skills, communication skills and interpersonal skills. Jobs in this industry are demanding. So you should be able to perform well under pressure.

SCOPE AND OPPORTUNITIES IN DEFENCE SECTOR

14th September, 2021



Lt. Gen. A.V. Subramanian (Retd.)
Chairman of SIDM R&D and
Technology Committee, Former
Director General of Weapons
and Equipment at IHQ (Army)

Recent Developments in Defence and Security Sector:

International Context

As a turbulent year nears, one must look forward to what might be another year of global upheaval. As the globe fights to recover from the Covid-19 catastrophe, a massively economically devastating and consequential occurrence poses worldwide threats to security and privacy. This necessitates the need for freedom of expression and information. The constant use of social media and its growing prominence is resulting in the throwing of digital insults. It is only a matter of time this will metamorphose into cyber-attacks. Data thefts or physical military conflicts are both possible outcomes. As a result, there is a significant amount of pressure on countries to step up their innovation and research endeavours. In order to stay ahead of the defence game, one must invest in research and development.

While the defence industry fared well during the war, the pandemic has led economies to decelerate dramatically and several countries' gross domestic products to plummet as a result of the same. According to the World Bank, the world economy will contract by 5.2 percent this year. In 2020, while countries regrouped in the aftermath of the disaster, priorities shifted to other public services in the event of a pandemic. Budgets for defence were reduced. While there was significant economic loss, in 2021, the global economy resulted in lower government spending. It is pertinent to note here that because of the geopolitical context, certain countries continue to prioritise defence.

In November, for instance, UK Prime Minister Boris Johnson announced a £16.5 billion increase in defence spending over the previous year. In the next four years the UK's defence budget will be increased in a meaningful way for the first time. With the Brexit transition period ending on December 31, 2020, and the

EU-UK Trade and Cooperation Agreement excluding cooperation on foreign policy, external security, and defence, the question of what the UK's future defence and security relationship with the EU will look like, and in which areas of defence and security policies industry partners will still be able to coordinate their efforts, however remains unanswered.

Meanwhile, on the other side of the Atlantic, the 2020 US presidential election was one of the most important in terms of foreign policy in decades. President-elect Joe Biden's government was expected to be quieter than Trump's, but it undoubtedly has been embracing globalisation. Biden has boosted US ties with NATO members, Japan, and South Korea, as well as attempted to ease tensions with China and Russia that had grown under Trump's leadership. With international combat moving beyond land and air, the military and security sector will inevitably be tasked with procuring high-value, technologically complex, mission-critical assets in the future. Given Russian and Chinese efforts to build anti-satellite capabilities, major military countries are displaying a large surge in interest in space. This includes the necessity to secure the security of satellites. Bank transactions, traffic networks, national power grids, and even parts of governments' coronavirus responses are all governed by satellites (eg, logistics of rolling out vaccines).

In the United Kingdom, a new National Cyber Force, made up of personnel from GCHQ, the Ministry of Defence, the Secret Intelligence Service (MI6), and the Defence Science and Technology Laboratory is working alongside GCHQ's National Cyber Security Centre, and the Ministry of Defence is forming a new 'Space Command.' These moves came less than a year after Trump announced the creation of the United States Space Force. France too had launched its Space Defence Strategy in 2019, attaching a major space command to its existing air force to create the French Air and Space Force.

The COVID-19 problem has demonstrated how misinformation and managed influence are posing new and rapidly evolving challenges for governments. The aforementioned geopolitical factors, as well as a pandemic that has turned the attention of most countries to public health and containment, defence and security

procurement may decline globally in 2021 owing to the aforementioned factors.

In the immediate term, the challenges created by the pandemic for defence industries, including cash flow issues and supply chain interruptions (especially for those defence companies touched by the severe slowdown in the aerospace sector), are expected to have an influence on procurement programmes. Procurement budgets need to prioritise spending on specific programmes in the long run. It is critical for procurement organisations to be able to take full advantage of relevant commercial breakthroughs.

Indian Context

India's defence policy is part of the country's overall national security framework. National Defence Policy is an intrinsic part of national security policy, which by its very nature is multidisciplinary in character and embraces all areas that increase a nation's strength and hence promote its security. India's defence policy is divided into two parts, firstly on a diplomatic and political level, secondly on a military level. However, India recognises that diplomacy will only be effective in maintaining peace and stability with its neighbours in the region and even globally if diplomacy is backed by credible military deterrence.

India's defence industry is a crucial sector from a strategic standpoint. The Indian military's entire budget for the fiscal year 2019 was \$60.9 billion, while the budget for the fiscal year 2020-21 is US\$65.86 billion, an increase of little under 7%. India has been seeking for increased indigenisation of military hardware because it imports over 70% (by value) of its high-tech defensive hardware from Russia, Japan, Israel, and the United States.

Following the outbreak of COVID-19, the Finance Minister said that the automatic route limit for foreign investment in the defence sector will be increased from 49 percent to 74 percent. The global original equipment manufacturers ("OEM") lobby had long demanded this, citing concerns about transferring high-end, proprietary technology to Indian companies they couldn't manage. As a result, while the government's action is unquestionably a positive step that should boost foreign investment in the sector, the impact of other features of

the current regulatory framework may dampen this optimism.

The reality of the Indian defence ecosystem is that the vast majority of foreign investments are made for offset purposes, and are initially limited to the production of low-tech products, spare parts, and components. The initial roadblock to such technology transfer has been removed with the acceptance of foreign control and the enhanced 74 percent limit. However, allowing Indian joint ventures with 74 percent foreign participation to compete in domestic procurements as Indian vendors will encourage knowledge transfer.

Intriguingly, the draft Defence Procurement Procedure (DPP)-2020, which was released for public comment in March, introduces a new category of procurement under the heading Buy (Global – Manufacture in India), which recognises foreign OEMs setting up an Indian subsidiary to participate in procurement. However, the draft DPP-2020 emphasised that the Indian vendor's control should be in Indian hands for all other objectives.

The Present Scenario

According to the Defence Acquisition Procedure 2020, in order to meet the current and future security needs, the Services must prioritise transformation initiatives based on a long-term strategic plan, from which procurement plans for service modernization based on Capital Acquisition Plans should flow. Gen. Bipin Rawat, the Chief of Defence Staff, is working on a new Integrated Capability Development Plan, or ICDP. It will serve as the foundation for the Army, Navy, and Air Force's procurement plans. This ICDP review will have an impact on the three forces' long-term procurement strategies.

Up until now, an integrated acquisition plan was prepared by the Headquarters Integrated Defence Staff (hereinafter "IDS"). On the other hand, Individual Services, pushed their procurement plans through because the IDS was led by a three-star officer. As a result of this, the government found itself in a bind because procurement projects pile up without a decision being made on whether or not a programme was still needed, and more programmes should be added to the list. Currently, the integrated procurement plan resembles a laundry list of separate Services. However,

Gen. Rawat intends to bring the heft that integrated planning lacked.

This integrated planning will further help in tackling some of the major threats. Recently, it was realized that India's strategic focus needs to shift from long-time rival Pakistan to China. Moreover, Taliban's rule in Afghanistan has casted concern over India's defence strategy. The increased possibility of terrorists in the restive northern part of Jammu and Kashmir receiving ammunition support from Afghanistan have increased exponentially and will have an impact on India's security. Even though border defences have been strengthened, India's military establishment should be concerned about the militant group's return to power which can potentially aid terror groups operating in the region.

This demonstrates the need for India's military to be reorganised into theatre commands along its northern and western borders. The move to integrate the army, air force, and navy, which currently operate in silos, comes as the United States and the United Kingdom collaborate with Australia to deploy more nuclear-powered submarines in Asia-Pacific waters.

In an attempt to integrate military services and accentuate their force, India has signed contracts and cleared projects worth nearly 54,000 crores in less than a month to boost military capability with locally produced weapons and systems, including transport planes, tanks, helicopters, airborne early warning systems, and counter-drone weapons, as part of a major push toward defence self-reliance. The government's commitment to achieving *atma nirbharta* (self-reliance) in defence manufacturing is reflected in this development. To increase self-reliance, India has decided to prohibit the import of 209 weapons and systems. Artillery guns, missile destroyers, ship-borne cruise missiles, light combat aircraft, long-range land attack cruise missiles, basic trainer aircraft, and certain types of helicopters are all covered by the ban, which will be phased in until 2025.

As a result of the reduction in reliance on imported military hardware, the Indian domestic defence ecosystem is expected to become more robust in the coming years.

Scope And Opportunities in Security And Defence Sector

As a part of the introductory comments, there was a significant emphasis on the notion of "Atmanirbhar Bharat". It has been highlighted that India has been an IT behemoth for the longest time, but unfortunately it has not been able to achieve a stronghold over production and manufacturing sectors. Accordingly, there is an increasing need to utilise the latest technologies and equipment, while at the same time reducing India's reliance on imports through self-reliance by way of Atmanirbhar, Made in India schemes, etc.

In defence acquisitions particularly, there is a predominance of the law of contract which talks about the law of agency. Furthermore, ethics would always be an underlying theme because it is the Government that is conducting the business and we must allow ethics to play its pertinent role.

In comparison between Common Acquisition and Defence Acquisition procedures, it is observed that in the latter, the contract plays a central role in governing the acquisition. When the Government desires for changes to be effected in the contract, the concept of equitable adjustment comes into play in context of the adjustment in the payables. Liability issues in a national acquisition are softened to a large extent, however in an international transaction, the liability issues can play a very significant role. We then need to address the liability governance, liability clauses and the extent of the liability and see how the laws and policies related to that get interpreted. In the aerospace sector, the liability issues become even more important since an aerial vehicle could land in another nation and if it is a space asset then the issues become even more nuanced.

It is common knowledge that India is a member of major multilateral export control regimes including the Wassenaar Agreement, Australia Group, Missile Technology Control Regime (MTCR), Nuclear Suppliers Group (NSG), etc. The "Special Chemicals Organisms Materials Equipment and Technologies" (SCOMET) List, has many lists associated with it, and they govern the export dual-use items. The export of SCOMET items are prohibited, restricted, or exempted from authorisation.

To foster innovation and development in technological advancement, India has taken various steps to

encourage start-ups. One such initiative is the Start-up India Seed Fund Scheme (SISFS) started by the Ministry of Commerce and Industry. Moreover, since start-ups are mostly technology driven companies, they need a legal envelope to guide them. These businesses have their share of legal issues in terms of intellectual property, international regulatory compliance, etc. In light of steps taken to develop the defence sector, India has witnessed an immense growth in the same. For instance, India had a CAGR of 3.9% in the defence sector between 2016 and 2020.

An initiative to foster international collaboration in the defence sector is the Strategic Partnership Model which was first introduced in 2016 and is now embedded in the Defence Acquisition Policy of 2020. It envisages the establishment of long term strategic partnerships with Indian entities through a competitive and transparent process wherein they would tie up with Global Equipment Manufacturers to seek technology transfers to set up domestic manufacturing infrastructure. This Policy possesses the potential to drive forward the large units that are in the process of manufacturing submarines and aircrafts. Furthermore, due to international collaborations, there would be an array of legal issues involved such as the utilisation of Special Purpose Vehicles (SPVs) for these collaborations.

Moreover, the Uttar Pradesh and Tamil Nadu Defence Industrial Corridors that are currently in development and set to complete in 2024, would definitely provide the much needed impetus in the defence ecosystem.

In the last decade or so, there has been a meteoric rise in investments and initiatives taken by the Government to revolutionise the defence sector. In today's time it can be observed that the defence sector is transforming from a state-driven industry to an industry with rising private participation. With an ever-rising defence sector, there is a parallel increase in the need for legal assistance in terms of contract drafting and interpretation, regulatory compliances – both at the national and international level, and issues related to investments from national and international entities.

Therefore there is a pressing need for a legal curriculum which introduces students to the nuances of the defence sector in India and abroad. Such knowledge and training is imparted to the students by the NALSAR University of Law through its multidisciplinary approach in offering courses on introduction to law and its role in the respective sector, defence management, defence contracts, defence procurement policies etc. which aims at providing information and education regarding specialized sector to the doorstep of the needy at an affordable cost.



SCOPE AND OPPORTUNITIES IN MARITIME SECTOR

15th September, 2021

Recent Developments in Maritime Industry³:

The global health and economic crisis triggered by the pandemic has upended the landscape for maritime transport and trade and significantly affected growth prospects. UNCTAD projects the volume of international maritime trade to fall by 4.1% in 2020. Amid supply-chain disruptions, demand contractions and global economic uncertainty caused by the pandemic, the global economy was severely affected by a twin supply and demand shock. These trends unfolded against the backdrop of an already weaker 2019 that saw international maritime trade lose further momentum. Lingering trade tensions and high policy uncertainty undermined growth in global economic output and merchandise trade.

Volumes expanded by 0.5% in 2019, down from 2.8% in 2018, and reached 11.08 billion tons in 2019. In tandem, global container port traffic decelerated to 2% cent growth, down from 5.1% in 2018. Trade tensions caused trade patterns to shift, as the search for alternative markets and suppliers resulted in a redirection of flows away from China towards other markets, especially in southeast Asian countries. The United States increased its merchandise exports to the rest of the world, which helped to somewhat offset its reduced exports to China. New additional tariffs are estimated to have cut maritime trade by 0.5% in 2019, with the overall impact being mitigated by increased trading opportunities in alternative markets.

In 2020, international maritime trade and global supply chains were hit by the impact of the COVID-19 pandemic. Overall however, maritime transport managed to navigate through the crisis, and for some parts of the supply chain the impact was not as dramatic as initially feared. Carriers were able to mitigate the early shock and manage lower levels of demand. Port and landside operations, however, struggled to adjust, and the world's seafarers faced a precarious situation as they became caught up in an unprecedented global crew-change crisis. In 2020, global economic output fell by 3.5 per cent and merchandise trade by 5.4 per cent, while

international maritime shipments fell by 3.8 per cent, to 10.65 billion tons. However, UNCTAD expects world maritime trade to recover by 4.3 per cent in 2021, and growth is projected to continue over the 2022–2026 period, albeit at rates that will be moderated by the easing in world economic output. Although the short-term outlook is positive, the medium- and longer-term prospects remain uncertain: the upturn will be directed by the future path of the pandemic and the associated lockdowns and restrictions. A lasting recovery also hinges on keeping trade flowing, by creating supportive macroeconomic and fiscal conditions while minimizing trade protectionism.

Throughout 2021, much of the global economic revival will be driven by government spending in major economies, so the patterns and geography of the recovery will be shaped by the ways in which their governments wind up these support measures – in terms of scale, focus, and timing. Progress could, however, still be derailed by further outbreaks of the pandemic, by slow vaccine deployment and in many economies by the limited scope for policy support. It has become clear that broad-based recovery will require an end to the health crisis and an equitable distribution of vaccines across all regions, developed and developing. Starting in late 2020, a swift rebound in containerized trade stumbled against supply-side constraints – which increased costs, dented reliability of service, and undermined the operation of value chains. As global demand patterns normalize, these problems are likely to dissipate, but the longer-term outlook will continue to be shaped by wide-ranging and longer-term structural factors, including patterns of globalization, changes in consumption habits, digitalization and the growth of e-commerce, as well as by the global energy transition and the imperative of environmental sustainability.

The impact of COVID-19 has also highlighted the need for better risk management, and greater preparedness, and resilience. The disruption was amplified by other events that created transport bottlenecks – in some countries by flooding, for example, and especially by the blocking of the Suez Canal, which exposed risks and

³ Source: https://unctad.org/system/files/official-document/rmt2021_en_0.pdf

vulnerabilities in supply chains. Building future resilience will entail reforming business models and global supply chains, and reorganizing maritime transport networks.

Maritime Industry in India⁴:

According to the Ministry of Shipping, around 95% of India's trading by volume and 70% by value is done through maritime transport. In November 2020, the Prime Minister, Mr. Narendra Modi renamed the Ministry of Shipping as the Ministry of Ports, Shipping and Waterways.

India has 12 major and 205 notified minor and intermediate ports. Under the National Perspective Plan for Sagarmala, six new mega ports will be developed in the country. The Indian ports and shipping industry play a vital role in sustaining growth in the country's trade and commerce. India is the sixteenth-largest maritime country in the world with a coastline of about 7,517 kms. The Indian Government plays an important role in supporting the ports sector. It has allowed Foreign Direct Investment (FDI) of up to 100% under the automatic route for port and harbour construction and maintenance projects. It has also facilitated a 10-year tax holiday to enterprises that develop, maintain and operate ports, inland waterways and inland ports.

Market Size

India's key ports had a capacity of 1,534.91 million tonnes per annum (MTPA) in FY20. In FY21, all key ports in India handled 672.60 million tonnes (MT) of cargo traffic.

Merchandise exports reached US\$ 290.63 billion in FY21.

In September 2021, India's merchandise exports grew 21.3% year-on-year to US\$ 33.44 billion, this was 28.5% higher than pre-COVID levels of September 2019.

In October 2021, the country's merchandise exports rose by 40.54% year-on-year to reach US\$ 15.13 billion. The centre has set the exports target at US\$ 400 billion in FY22.

The Government has taken several measures to

improve operational efficiency through mechanisation, deepening the draft and speedy evacuations.

Between April 2021 and August 2021, cargo handled by India's 12 state-owned major ports recorded an increase of 19.54%, from 245.289 MT to 293.226 MT.

In August 2021, cargo traffic handled by India's major ports reached 57.59 MT, an 11.43% increase over the 51.68 MT recorded in August 2020.

Investments/Developments

- In October 2021, the Syama Prasad Mookerjee Port, Kolkata, gave importers the opportunity to bring in vessels at the deep drafted anchorages located at Sagar, Sandheads and X Point.
- In October 2021, Adani Group announced that it wants to make Adani Port a net-zero carbon emitter by 2025 and power all its data centres with renewable energy by 2030.
- Jawaharlal Nehru Port Trust (JNPT) Special Economic Zone (SEZ) became the first of its kind operational port-based multi-product SEZ in India.
- The Competition Commission of India (CCI) approved Adani Ports and Special Economic Zones proposed acquisition of 10.40% equity investment in Gangavaram Port in September 2021. The 10.4% equity shareholding will be bought from the government of Andhra Pradesh.
- APSEZ (Adani Ports and Special Economic Zone) plans to become the world's largest private port company by 2030 and carbon neutral by 2025.
- In July 2021, Adani Ports & Special Economic Zone stated that it has priced a US\$ 750 million senior unsecured dollar notes issuance with 20-year and 10.5-year tranches, with fixed coupons of 5.0% and 3.8%, respectively.
- In June 2021, Adani Ports and Special Economic Zone Ltd (APSEZ) handled cargo volume of 75.69 MMT, registering a YoY growth of 83%, in the first quarter of FY 2021-22.

⁴ Source: <https://www.ibef.org/industry/ports-india-shipping.aspx>

- In July 2021, India's merchandise exports reached US\$ 95 billion in the three months ended June.
- In April 2021, the Competition Commission of India (CCI) approved the plan to acquire 89.6% of Gangavaram Port Limited by Adani Ports and Special Economic Zone Limited (APSEZ).
- In April 2021, Adani Ports signed an agreement with Vishwa Samudra Holdings Pvt. Ltd., to acquire 25% stake of Adani Krishnapatnam Port Limited (Krishnapatnam Port) for a consideration of Rs. 2,800 crore (US\$ 226.4 billion).
- In March 2021, Adani Ports and Special Economic Zone Limited (APSEZ) announced plans to acquire 58.1% stake in Gangavaram Port Limited for Rs. 36.04 billion (US\$ 493.7 million). The port is currently owned by DVS Raju and family
- In March 2021, Adani Ports announced to partner with John Keells Holdings and Sri Lanka Ports Authority to develop and operate the West Container Terminal of the Colombo Port in Sri Lanka for 35 years
- In February 2021, JNPT (Jawaharlal Nehru Port Trust) launched a comprehensive solid waste management project as a part of its green port initiatives.
- In November 2020, Mormugao Port Trust (MPT), operator of the western Indian port of Mormugao, extended concessions on iron ore imports and export freight traffic until June 2021 to help ease India's iron ore shipping trade amidst the COVID-19 pandemic.
- In November 2020, JSW Infrastructure completed the acquisition of Chettinad Group's port business for ~Rs 1,000 crore (US\$ 135.50 million). This acquisition will enable JSW Infrastructure to gain ownership and operational control of a deep draft international coal terminal and a bulk terminal at Kamarajar Port Limited (KPL) as well as a coal and bulk commodity terminal at New Mangalore Port Trust (NMPT).
- In October 2020, Adani Ports and Special Economic Zone Limited (APSEZ) completed the acquisition of Krishnapatnam Port Company Ltd. (KPCL) for an enterprise value of Rs 12,000 crore (US\$ 1.63 billion)
- In July 2020, Adani Ports and Special Economic Zone (SEZ) Ltd, launched an offshore bond offering, raising ~US\$ 750 million.
- Ports sector in India has received a cumulative FDI worth US\$ 1.64 billion between April 2000 and March 2021.
- In January 2020, DP World launched a new rail service between Kochi and Bangalore to lower costs and reduce transit time between the two cities by >40%.

Government Initiatives

Some of the major initiatives taken by the government to promote the ports sector in India are as follows:

- The Draft Indian Ports Bill 2021, which was circulated in July 2021, aims to centralise the administration of minor ports that are currently managed by state governments.
- The Inland Vessels Bill 2021 was approved by the Lok Sabha in July 2021. Instead of distinct regulations created by the states, the bill attempts to include a single legislation for the country. The registration certificate issued under the new law will be valid throughout the country and state approvals will not be necessary. The bill also establishes a single database for recording vessel and crew information on an Internet portal.
- In July 2021, the Marine Aids to Navigation Bill 2021 was passed by the Parliament, incorporating global best practices, technological developments and India's international obligations in this field.
- In June 2021, the Gujarat government provided approval to build a new jetty worth an estimated ~Rs. 192 crore (US\$ 25.77 million) at Navlakhi port which has been in operation since 1939.
- In June 2021, the Ministry of Ports, Shipping and Waterways and Ministry of Culture sign an MoU for cooperation in development of National Maritime Heritage Complex at Lothal, Gujarat
- In June 2021, the Ministry of Ports, Shipping and Waterways and Ministry of Civil Aviation signed a

memorandum of understanding (MoU) to develop seaplane services in India.

- On May 10, 2021, JNPT and New Mangalore Port handled 120 tonnes of medical oxygen on a priority basis owing to the COVID-19 pandemic.
- India is expected to begin full operations in Iran's Chabahar Port by the end of May 2021. India is building two terminals at the port and will operate them for 10 years
- In the Union Budget 2020-21, the total allocation for the Ministry of Shipping was Rs. 1,702.35 crore (US\$ 233.48 million).
- The key ports are expected to deliver seven projects worth more than Rs. 2,000 crore (US\$ 274.31 million) on a public-private partnership basis in FY22. Private sector investments in ports have steadily increased over the last five years, touching an all-time high of US\$ 2.35 billion by 2020.
- The Finance Minister proposed to double the ship recycling capacity of ~4.5 million light displacement tonnes (LDT) by 2024; this is expected to generate an additional ~1.5 lakh employment opportunities in India.
- In Union Budget 2021, the government announced subsidy funding worth Rs. 1,624 crore (US\$ 222.74 million) to Indian shipping companies to encourage merchant ship flagging in the country.
- In February 2021, the Major Port Authorities Bill, 2020 was passed by the Parliament of India. The bill aims to decentralise decision-making and reinforce excellence in major port governance.

Road Ahead

Increasing investment and cargo traffic point towards a healthy outlook for the Indian ports sector. Providers of services such as operation and maintenance (O&M), pilotage and harbouring and marine assets such as barges and dredges are benefiting from these investments.

The capacity addition at ports is expected to grow at a CAGR of 5-6% till 2022, thereby adding 275-325 MT of capacity.

Domestic waterways have been found to be a cost-effective and environmentally sustainable mode of freight transportation. The government aims to operationalise 23 waterways by 2030.

As part of the Sagarmala project, more than 574 projects worth Rs. 6 lakh crore (US\$ 82 billion) have been planned for implementation between 2015 and 2035.

In Maritime India Summit 2021, the Ministry of Ports, Shipping and Waterways identified a total of 400 projects worth Rs. 2.25 lakh crore (US\$ 31 billion) investment potential.

India's cargo traffic handled by ports is expected to reach 1,695 million metric tonnes by 2021-22 according to a report by the National Transport Development Policy Committee.

Emerging opportunities in maritime sector



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Maritime domain is drawing greater attention by Indian planners. Hitherto a largely neglected domain of sea is now being incorporated rapidly into India's development plans. Several issues relating to maritime domain – security, ports, shipping, energy, fishing, travel, coastal communities, deep sea resources, science and technology and many others – are undergoing policy and legal reformulation. As a result, opportunities for career in these areas are opening up new vistas for maritime legal and vocational careerists.

Maritime security, its scope and responsibilities are thoroughly reshaped. UNCLOS (United Nations Law of the Sea, 1982) vastly increased the sovereign jurisdiction of a coastal country over the sea. UNCLOS divides sovereign zones of a coastal country into four types: Territorial Sea (12 nautical miles); Contiguous Zone (24 nautical miles); Exclusive Economic Zone (EEZ, 200 nautical miles); Continental Shelf, 200 nautical miles). As a result of these vast areas Indian maritime security forces like the Navy and Coast Guard are obliged to increase their security roles and

personnel. These two agencies however are short of effectively safeguarding the country's maritime areas and coastal zones. Because greater and frequent threats to these areas are from threats posed by the state and non-state actors, mostly from the latter. Smugglers, drug traffickers, illegal migrants, poachers, pirates and terrorists are today challenging regularly the ability of Indian security agencies to safeguard the country's rights and resources on the sea. Terrorist attack on Mumbai in November 2002 had vindicated the vulnerability of the nation's national security to the violent threats from sea. Hence, following the 26/11 attack Government of India created Coastal Police Stations. As a result prospects for recruiting maritime protection personnel have increased.

In addition, private business groups engaged in coastal trade and commercial activities are also opening up opportunities to recruit manpower for protecting the onshore and offshore establishments. The Indian maritime sector today is opened for active involvement of private investing and trading corporations. Port and shipbuilding, coastal industrial belts, roads, aquaculture, pharmaceutical, leather, tourism, petrochemical, oil and gas exploration, and special economic zones (SEZ) are the emergent industrial enterprises located along the 7515 km. coastline. Securing these establishments from the myriad seaborne threats is vastly creating scope for security personnel not only the ordinary but qualified and technical graduates.

Just as the private and foreign corporates are involved in the Indian maritime industrial sectors, scope for trade and investment disputes increases commensurately. Issues relating to the port rights and operations, shipping laws, investment contracts and guarantees, arbitration,

environmental safety, coastal zone regulatory systems, illicit transactions like money laundering and smuggling and several such activities have enlarged the scope for disputes involving the private stakeholders, law enforcement authorities and NGOs. Lamentably, India seriously lacks maritime law experts and adjudicatory authorities and tribunals to settle such disputes. Hence, there is an urgent need for qualified and trained legal specialists to settle maritime legal disputes. NALSAR University therefore has launched relevant courses to create a pool of qualified maritime law professionals. It is gratifying that year to year the number of candidates enrolled into these courses is increasing.

As coasts are rapidly industrialized, urban growth is also encroaching into the legally forbidden zones demarcated to preserve marine ecosystem and biodiversity. These laws however are unable to restrict the illegal activities of the encroaching traders, builders and occupants. There is therefore growing volume of cases against individuals and corporates for violation of the coastal zone regulations and environmental laws. But legal professionalism in maritime laws dealing with environment, encroachments, oil pollution and marine life destruction is very inadequate. The growing demand for experts in maritime environment laws, coastal regulations and related legal regimes can hardly be emphasized.

Employment opportunities in the emerging marine sectors are very encouraging. To mention a few such are port management, transport logistics, e-business, legal drafting, ship and port construction, deep sea technologies, maritime tourism and heritage, and a host of other such are the promising fields of career building.



SCOPE AND OPPORTUNITIES IN SPACE SECTOR

16th September, 2021

Recent developments in Space Sector:

The launch of Sputnik in the year 1957 ushered humanity into a new era. Entry into the 'space age' brought new challenges for lawyers practicing international law. Questions like where does Outer Space begin, who owns Outer Space, can countries have a military presence in Outer Space and can international law even apply to Outer Space are examples of pressing questions that law had to answer in order to regulate the vast emptiness of Outer Space. These questions received global attention with specialized bodies like the Committee on Peaceful Uses of Outer Space (COPUOS) being established by the United Nations to provide a forum for countries to decide how to regulate Outer Space.

General Assembly resolution, 'International Cooperation in the Peaceful Uses of Outer Space', UNGA Res.1721 (XVI) of 20 December 1961¹ marked one of the earliest attempts to lay down the law governing Outer Space. Fundamental principles such as mandating use of Outer Space for the benefit of mankind as a whole, prohibition of national appropriation of Outer Space and creating a free right to explore Outer Space were laid down by this resolution, providing a broad consensus on the skeletal framework to govern Outer Space. General Assembly Resolution International Cooperation in the Peaceful Uses of Outer Space', UNGA Res.1802 (XVII) of 19 December 1962 reaffirmed these principles and stated that states ought to act in Outer Space in accordance with principles of international law², thus making the application of international law to Outer Space explicit. Such resolutions paved the path for the 'constitution of Outer Space', namely, the 1967 outer space treaty,³ which affirms and builds upon the fundamental principles

espoused in the general assembly resolutions. The importance of the resolutions passed prior to the Outer Space treaty is understood when one turns to resolutions passed post Outer Space treaty, which merely 'adopt' principles as opposed to 'declaring' them like the former.

With the passage of the Outer Space treaty, the basic principles espoused in the various resolutions were made binding and enforceable. The treaty espoused that Outer Space exists as the 'province of all mankind'⁴ which denotes outer space as a zone that cannot be governed by any single country and as a zone that shall be governed by humanity as a whole. The treaty also states that the exploration of Outer Space is free for all countries and no part of Outer Space can be appropriated by a state.⁵ Apart from these basic principles, the treaty also provided guidance on the status of astronauts and questions of jurisdiction in Outer Space, with Article VIII providing states with quasi-territorial jurisdiction over their registered space objects⁶ and Article VI arguably provides personal jurisdiction.⁷

Principles concerning liability, registration and status of astronauts were expanded in the 1972 Liability Convention,⁸ the 1975 Registration Convention⁹ and the 1968 Rescue and Return Agreement.¹⁰ The liability convention expands on the principles of liability in Outer Space and provides guidance on when liability is absolute,¹¹ when liability is fault based¹² and procedure for claims of damage.¹³ The registration convention concerns itself with the creation of an international registry,¹⁴ procedure for registering space objects and procedure for registration of space objects which are a part of multinational projects.¹⁵ Finally, the Rescue and Return agreement lays down rules concerning the rescue of astronauts and return of space objects when

¹ G.A. Res. 1721 (XVI), 6 (Dec. 20, 1961), [hereinafter Resolution 1721].

² G.A. Res. 1802 (XVII), 5 (Dec. 14, 1962), [hereinafter Resolution 1802].

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of outer space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter "outer space treaty"].

⁴ Article I, Outer Space treaty.

⁵ Article II, Outer Space treaty.

⁶ Article VIII, Outer Space treaty.

⁷ Article VI, Outer Space treaty.

⁸ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter "liability convention"]

⁹ Convention on Registration of Objects Launched into outer space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter "registration convention"]

¹⁰ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into outer space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter "rescue and return agreement"].

¹¹ Article II, Liability Convention.

¹² Article III, Liability Convention.

¹³ Article VIII, Liability Convention.

¹⁴ Article III, Registration Convention.

¹⁵ Article II, Article IV, Registration Convention.

the space object landed in the jurisdiction of a state,¹⁶ when the space object landed in high seas and resolved queries of concurrent jurisdiction in rescue and return operations.¹⁷

The latest and most contentious treaty governing Space Law is the 1979 Moon Agreement,¹⁸ which many scholars deem a failure owing to its abysmally low number of signatories. The most controversial element of this treaty is its rules concerning the commercial exploitation of resources in Outer Space. The treaty builds on the Outer Space treaty and declares the Moon to be “Common Heritage of Mankind”¹⁹. While the specific elements of this principle are subject to intense debates between the global south and the global north, on a basic level, the principle is concerned with the management of resources in a zone and requires exploitation of principles regulated and owned by an international regime.

After the passage of these treaties, the law governing Outer Space lost its steam and stagnated. However, technological and geo-political changes are forcing the international community to wake Space Law from its slumber.

Rapid improvements in technology, like usage of cost-effective rocket delivery systems coupled with the rise of private mining corporations like Planetary Resources and Moon Express, make the act of mining resources in outer space more accessible than ever and raise serious questions about the ownership and commercial usage of resources in outer space and Celestial bodies.

These technological changes have been noted by countries like the United States, which have come up with international agreements like the Artemis Accords,²⁰ which involves signatories espousing an interpretation of Article II of the Outer Space treaty, where the exploitation of extractable resources in Outer Space does not violate Article II. The technological advancements have also

caught the attention of COPUOS, which has finally decided to create a working group to understand the views of various countries on the issue of property rights in Outer Space.²¹

Another major issue that is catching the attention of international organizations is the issue of space debris with a special focus on debris being created as a result of increased military presence in Outer Space with countries testing ASATs by destroying old satellites. Noting the presence of an arms race in Outer Space, the UN first committee created a working group to create principles, norms and guidelines for preventing an arms race in Outer Space.

Apart from these issues, there is also a sharp increase in private activities in Outer Space, which raises questions as to whether the law governing ownership of space objects, state responsibility and liability can deal with complicated scenarios which involve multinational corporations selling and buying space assets. Furthermore, the process of creating space objects has become increasingly complicated in light of multiple parts being created in different countries, raising the question of whether the definition of 'launching state' in modern space law is equipped to deal with these changes. The increased commercialization of Outer Space also raises questions of finances and securities over space assets.

Indian Scenario:

India's tryst with Outer Space began with space research being assigned and entrusted to the Department of Atomic Energy. In the year 1962, the department of Atomic Energy set up with Indian National Committee for Space Research, which was reconstituted as ISRO in the year 1969. Finally, in the year 1972, the Department of Space was instituted and ISRO was brought under its management.

¹⁶ Article 2, Article 4, Article 5, Rescue and return agreement.

¹⁷ Article 3, Article 4, Article 5, Rescue and return agreement.

¹⁸ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 1363 U.N.T.S. 3 [hereinafter “Moon Agreement”].

¹⁹ Article 11, Moon Agreement.

²⁰ Section 10, The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids, NASA;

²¹ COPUOS, General exchange of views on potential legal models for activities in exploration, exploitation and utilization of space resources, A/AC.105/C.2/L.314/Add.8.

On an international platform, India is signatory to the Outer Space treaty, the liability convention, and the agreement on rescue and return of astronauts and the registration convention. Apart from these international agreements, India is also party to the International Telecommunications Union and India's domestic frequency allocation plan is based on ITU radio regulations.

With respect to satellite communications, India maintains a satellite communications policy that was created in 1997, with the government publishing rules governing the same in the year 2000. The policy and rules are again based on ITU regulations. The rules reflect the first attempt by the Indian government to push for privatization of Outer Space with the rules allowing the operation of foreign satellites and also allowing leasing of government satellites to private sector entities. It should also be noted that Foreign Direct Investment in Indian private satellite operators is capped at 74% according to the rules. The push for privatization also came with the establishment of the Antrix Corporation as the commercial wing of ISRO, which performs launches for third parties.²² In 2019, the government also established NewSpace India, which has functions similar to the Antrix Corporation.

However, India still lacks a dedicated legislation dealing with Outer Space and this may change with the advent of the draft space activities bill, 2017.²³ Taking inspiration from the International Law association's model law for national space legislations, the space activities bill is aimed at supporting the growth of space activities in India through both the private and public sector. While the bill is a welcome step in providing clarity with respect to the law governing Outer Space, the bill is not short of

controversy. Section 17, which lays down the law on indemnifying the government, is criticized on the grounds that they do not provide a cap on indemnity at the time of providing a license.²⁴ Section 25, which deals with application of Indian laws on intellectual property rights are problematic in that they state that any intellectual property developed on a space object in Outer Space shall be the property of the central government, thereby creating problems for private activities in Outer Space.²⁵ Furthermore, via Section 26, the government rejects any sort of liability for anything done in good faith in pursuance of space activity.²⁶ However, criticisms aside, the direction in which the government is headed, is the right one.



Opportunities in space sector

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1. The Transforming global scenario

Over the past decade, the fields of space technology and applications have seen decisive changes. The most striking are the many disruptive trends in access to space. The use of the present well proven technologies relevant to reusability of launch transportation systems by enterprises like SpaceX has resulted in four to five fold reductions in the cost of launching a kilogram of payload into space. In tandem, one can witness the emergence of a large number of Low Earth Orbit constellations for a diverse range of applications. These are resulting from many spin-in innovations adapted to the space field from technological advances for consumer electronics,

¹⁶ Article 2, Article 4, Article 5, Rescue and return agreement.

¹⁷ Article 3, Article 4, Article 5, Rescue and return agreement.

¹⁸ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 1363 U.N.T.S. 3 [hereinafter "Moon Agreement"].

¹⁹ Article 11, Moon Agreement.

²⁰ Section 10, The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids, NASA;

²¹ COPUOS, General exchange of views on potential legal models for activities in exploration, exploitation and utilization of space resources, A/AC.105/C.2/L.314/Add.8.

²² Aditya Vikram Sharma, India's new space policy: propelling into the final frontier, (1 December 2021, 1:30PM) <
<http://rsrr.in/2021/03/01/space-policy-isro-in-space-privatisation/>>

²³ Draft Space Activities Bill, 2017, PRS (Mar. 15, 2018, 6:35 P.M.), <http://6nwww.prsindia.org/uploads/media/draft/Draft%20Space%20Activities%20Bill%202017.pdf>.

²⁴ Section 17, Draft Space Activities Bill.

²⁵ Section 25, Draft Space Activities Bill.

²⁶ Section 26, Draft Space Activities Bill

computing and communications. Earth observing applications from space have also been converging into bigger markets related to Information Technology Enabled Services. Security in space has been a major concern too besides the growing trend of using space systems for enhancing the global and national security infrastructure. Turning to the field of law, in the backdrop of a long-term stalemate in the development of international space law, the national legislations are taking precedence and they are becoming the instruments for driving new developments in regulatory measures for emerging activities in space including mining of space resources and other forays such as space tourism and the missions aimed at greater human presence in deep space as well as activities on planetary bodies, in which the private enterprises are actively engaging themselves in tandem with various governmental missions.

Another direction in which significant changes had been manifested is in the field of small satellite constellations. Presence of micro and nano satellites in orbit has recorded a continuous growth over the years. It has been projected that their market size globally will be US\$ 4.8 billion by the year 2025. Launches of nano satellites during the five year period ending with 2020 have reached a value of 979 and in the following five years an additional 3138 satellites are projected to be launched. The flexibility and low cost of such satellites allow their deployment in large constellations delivering application services such as optical as well as radar imaging, tracking, Internet delivery, low earth orbit communications, Machine-to-Machine data exchange, Internet of Things (IoT), Automatic Identification System (AIS) to track ships, disaster monitoring and so on over the designed coverage regions. Modern tools allow expanded capabilities for modeling and performance analysis based on the data gathered from space. All the proposed satellites in the mini, micro and nano range add up to huge numbers causing worry on the debris potential they can generate and adding to the pollution already there. Starlink, a constellation operated by SpaceX for high speed Internet delivery globally to homes had already deployed 1800 satellites and in the long run it has ambition to grow this to 42000 satellites.

Though it appears that resource mining from space and

their further processing and transactions will be the preserve of a few nations and players outside the governments, it is an area waiting to be fully unfolded when low cost access is widely open and when barriers of economic, technological and politico-legal nature further become thinner. Resources in space primarily address three valuable needs such as energy, water and sources for valuable materials like gold, platinum, Nickel, Copper and rhodium. According to NASA/ Southwest Research Institute, about 12,000 asteroids pass each year close to the earth. These comprise of rocks, dust and metal lumps including an abundant source of scarce material ranging in size from a few meters to hundreds of kilometers across. It is also assessed that 10% of them will be amenable for landing. Another area that evoked considerable interest and developmental investment from the private sector is space tourism. Virgin Galactic, SpaceX, Blue Origin, Orion Span, Space Adventures and Kosmokurs are some examples of such enterprises conducting activities relevant to Space Tourism.

2. Recent policy initiatives for expanding India's Space Economy

Specifically turning to the space economy in India which is estimated around 7 billion US \$ equivalent, one may note that this is still less than 2% of the global space economy. The size of the global space economy for 2020 was estimated at US\$ 447 billion. The public expenditure in this was 20%, while the rest 80% of the value came through the commercial activities. True to the nature of high technologies, the downstream services constitute a predominant part of the overall space economy as compared to the upstream infrastructure in space. In India too, various services from space systems form the main part of commercial space activities, which include services like direct to home television (DTH), broadband Internet, imaging services from space, positioning based applications and space insurance. Many new horizons of growth have emerged in contemporary India with the advent of reforms in the space sector. An illustrative list of business segments is indicated in Table- 1. These are aiming at greater participation by the private sector.

Table-1 Commercial Space in India- Opportunity segments

Opportunities through Public funded programs		
Part of supply chain	Ground systems/ Applications	Futuristic Programs Product/ Services/AOO for:
Communication satellites	Gateway stations	Human Space Flight Programs (Gaganyaan I & future)
Remote Sensing Satellites	Network control equipment and stations	Chandrayaan 3 & beyond
IRNSS (NavIC) series	Remote Sensing Data receiving, processing stations	Venus Orbiter
Satellite equipment	User terminals for tracking and transport vehicles on land and sea	
Parts and components	Applications software and services	
Services	User receiver terminals and devices (dish antennas, positioning receivers etc.,)	

The Government of India had created a new mechanism, namely, the Indian Space Promotion and Authorisation Centre (IN- SPACe) which had been established in June 2020. It aims to provide a level playing field for private sector companies in satellites, launches and space. Its other objectives are (i) to provide predictable policy and regulatory environment to private players, (ii) provision of access to ISRO facilities and other relevant assets for use by private sector to improve their capabilities and capacities, and to encourage private sector participation, (iv) to open up emerging areas such as future projects for planetary exploration, outer space travel etc., and (v) liberalising geospatial data policy for providing remote sensing data to techno entrepreneurs.

Some major steps had also been taken for updating the sectoral policies relevant to space technology and its applications. The space remote sensing policy 2020 would promote Indian industries to carry out space-based remote sensing activities within and outside India; they would also enable easy access to space-based remote sensing data except for the sensitive data. The policy would also provide a timely and responsive regulatory environment for the commercial Indian industry to establish and operate space based remote sensing systems and data policies. The new guidelines on geospatial data is a watershed in removing the long felt impediments for the growth of geospatial industry and to unleash several beneficial applications These

guidelines promote the availability of competitive, highly accurate and granular and constantly updated representation of geospatial data, which will significantly benefit diverse sectors of the economy and also boost innovation in the country and greatly enhance preparedness of the country for emergency response. Future growth of GIS services are well poised given the following developments in the environment:

- New technology areas like cloud, new generations of analytics, AI/Machine Learning, IoT, Virtual Reality and mobile communication developments.
- More knowledge based applications like modelling
- Auto change detection and triggering corrective actions, assets management
- Workflow and business process improvement
- Analytics applications in forecasting, management of large complex systems, and,
- A host of customized applications at business enterprise level.

Increasing needs from government as well as markets in the setting of an economically growing resurgent India presents a unique opportunity over the next one to two decades. The recent Policy renewals would create an environment for burgeoning growth of services and in that context capacity building is a priority in order to utilize the full potentials of this opportunity.

The Space Based Communication Policy of India – 2020 (SPACECOM Policy 2020) has been proposed to

replace an earlier policy that existed since 2000. Through this policy the Government of India reiterated its commitment to promote increased participation of commercial Indian industry to provide space based communications both within the country and outside. Further it also committed to provide a timely and responsive regulatory environment for the commercial Indian industry to establish and operate space based communication systems.

All these initiatives can go a long way in encouraging innovations from a wider pool of entrepreneurial talent in the country in the field of space.

3. Towards building a strong space ecosystem in India

In the light of foregoing transformation in the overall environment, a number of opportunities can be seen considering the strengths that have been built in this field. The foremost among such opportunities is the possibility to build a quantum jump in bandwidth through the participation of both public and private sector. In the field of earth observations, it is necessary to reinvent the business models and enable emergence of new satellites with public and private partnerships. Considering the huge needs for robust security applications, a greater spurt in business opportunities can be foreseen. It is also possible to strengthen contributions from the private sector to expand the services based on positioning and tracking. Taking cognizance of India's autonomy in the strategic, technological arena, a new direction can be the expansion of India's navigation capabilities for global coverage with strong public support. In view of the global competition that prevails for space products and services it will be necessary to promote a viable industrial architecture to mitigate risks and improve their management through a network of supply chain providers, system /subsystem level integrators, service providers and aggregators. The aim is the strengthening of the sustainability of India's space industry.

It is heartening to see the emergence of several startup initiatives in India in response to the globally manifested New Space phenomena. What is interesting is that these initiatives span a wide range of areas that include low cost systems for launching small satellites, development of satellite platforms, remote sensing data services and analytics-based solutions, mini satellite constellations for applications like high-speed internet which can be

delivered cost-effectively and even advanced equipment such as electric propulsion thrusters. An indicative list of areas in which space related startups are depicted in Table-2. Some of these ventures are also spearheading into development of new technologies and products based on additive manufacturing, carbon nanotube products coating green propulsion IOT, and so on.

Table-2. Business areas chosen by the start-ups in India

A Snapshot of areas chosen by Start-ups

- Small Satellite systems and geospatial services
- Advanced electric Propulsion thrusters
- Small Satellite Launch Vehicle
- Small satellite (Cubesat) platforms
- Small satellite platforms; Assembly, Integration & Test;
- Remote sensing data, ML/DL Analytics, Prediction
- Constellation of 200 mini satellites; High speed Internet
- Small satellite Launch vehicle building
- Venture capital & deep tech investments
- Planetary spacecraft, rovers
- Satellite Big Data Analytics
- Space Education and Training
- Advanced electric Propulsion thrusters
- Space Communications and Navigation products
- Additive manufacturing for space
- Carbon nanotube products including coatings for space
- Green Propulsion
- Space debris mitigation
- Space Education by Cansats and CubeSats
- Laser Space Communications
- Simulations for Space plasma multi physics
- Space IoT
- Space Data Analytics

4. Need for a strategic approach

A major challenge in this field is the dominant market play and the overcapacity that prevails in advanced markets. Effectively using the New Space Opportunities in the face of these challenges needs strategic thinking. In order to realize the growth and sustainability of the space industry in India, a strong domestic market is to be developed taking advantage of initiatives such as Digital India and Make in India. Hand in hand a strong accent has to be placed for achieving global competitiveness and becoming part of global supply chains and expanding space services to overseas territories.

Several legal and policy challenges also have to be overcome in accelerating above developments. These have to address issues of minimizing the competition between government entities and private industry in the pursuit of commercial activities, entrusting the design and development contracts on industry wherever feasible, robust procurement plans by the government from private sector through policies such as long-term

buyback and other incentives to attract risk investments and bringing in policies in harmony with global practices. It is to be ensured that the Indian industry is not at a disadvantage as compared to its global competitors. A set of strategic goals realize our ambition to grow our national space economy by seven to ten-folds in a reasonable future and its implications are summarised in Table-3.

Strategic Goal	Impact	Challenge
Lowering launch cost ten fold	Increase of demand by two to three fold	Reusable systems development
Increasing bandwidth flowing through space hundredfold and more	Anchor to growth of downstream industry	Multi beam satellites New technologies LEO/MEO constellations Integration with terrestrial system
Information at consumer level, powered by space	Democratization of information, knowledge economy	National system of innovations
Collaborations aiming at expanded markets	Transcending the lag	Balancing Self reliance
New applications – Health & Education	Greater access, quality	Use the power of academic sector

5. National Space Legislation

India's national space legislation is a long felt need, which in the context of opening up space for the private sector would assume additional significance. Though an earlier initiative of the government addressed this issue, the scope of the bill and implications of its provisions for commercial and private activities had been a subject of debate. The draft legislation, which was placed earlier for public consultation, indicated its aim as the growth of space activities for the benefit of national development. However, there was inadequate clarity in the definition of space activities and space systems. There was a perception of huge liability risk looming large under the Liability Convention, and expectation of government support to cap the risks as practiced by other space faring nations. There was also a call for distinction among space enterprises on the basis of whether they are well-established or still a fledgling start-up. Clear policies and facilitation of greater access by the private sector to intellectual property rights created through public investments were felt necessary to accelerate innovations and greater economic impacts. Draft Space Activities Bill, 2017, would also need to be updated in

light of new provisions introduced through Space Reforms. Efficient and alternate systems for dispute resolutions is the need of the hour.

Outer Space activities both in terms of the legal regime and integrating cultural appeal represent a common province of humankind. Their multi-dimensional roles as accelerator of innovative and exploratory spirit and as a strategic tool for national security and societal benefits had been constantly throwing up questions of the ethics of Outer Space – which offers a challenging engagement for the bright legal minds.

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17th September, 2021

Recent Developments in GIS and Remote Sensing:

Remote sensing is a type of geospatial technology that employs active or passive sensors to acquire information about the earth's surface (land and ocean) and the atmosphere.¹ Passive sensors respond to external stimuli, gathering radiation that is reflected or emitted by an object or the surrounding space.² Whereas active sensors use internal stimuli to collect data, emitting energy in order to scan objects and areas whereupon a sensor measures the energy reflected from the target (LIDAR, RADAR).³

The information is gained without making any physical contact with the concerned area which facilitates the process of acquiring geospatial data of inaccessible terrains as well. It replaces slower, costly data collection on the ground, providing fast and repetitive coverage of extremely large areas for everyday applications, ranging from weather forecasts to reports on natural disasters or climate change. For instance, monitoring forest fires, floods, deforestation, chemical concentrations, and earthquakes are examples where geospatial remote sensing would provide a global perspective and actionable insights that would otherwise be unachievable.⁴

Remote sensing finds an array of diverse and highly pertinent applications across the globe. For instance, the global food supply is being monitored with satellite imagery and the **Normalized Difference Vegetation Index**. Near-infrared radiation is being used to detect healthy vegetation in agriculture.⁵ Another example would be the study of melting of glaciers in the polar regions. NASA's GRACE satellite showed that the Alaskan glaciers were losing mass at about 20.6 gigatons per year. The most ambitious remote sensing project undertaken till date is the **European Space Agency's Copernicus Programme**.⁶ The programme

intends to utilise satellites to study the health of the Earth by capturing comprehensive pictures of land, oceans, atmosphere, security, climate change, etc. The aforementioned instances are in tandem with Principle II of the Principles Relating to Remote Sensing of the Earth from Outer Space.⁷ The principle requires remote sensing activities to be carried out for the benefit and interest of all countries.

Furthermore, India too possesses a state-of-the-art remote sensing satellite programming that ISRO initiated in 1988 with the launch of the IRS-1A. The IRS system is the largest constellation of remote sensing satellites for civilian use in operation today in the world. The Indian Remote Sensing (IRS) programme has aided the mapping, monitoring, and management of natural resources. ISRO has launched various satellites based on the specific thematic applications such as oceans (OCEANSAT Series), atmospheric studies (INSAT), and cartographic applications, (CARTOSAT Series).⁸

A Geographic Information System (GIS) is a computer-based tool for mapping and analyzing feature events on earth. GIS technology integrates common database operations, such as query and statistical analysis, with maps. Remote sensed imagery is integrated within a GIS. The system is integrated with a backend database that can be used for queries and analysis of the maps. The database and the maps are represented using different statistical data including population, weather data, economic development characteristics, mining area survey data, etc. GIS links locational (spatial) and database (tabular) information to visualise where things are and understand why things are where they are.⁹

GIS and Remote Sensing, either individually or in combination, spans a wide range of applications with degree of complexity. These complex applications might include classification of vegetation for predicting crop

¹ Ranganath R. Navalgund and P. S. Roy, 'Remote sensing applications: An overview', 93 CURRENT SCIENCE 1747, 1748 (2007), <https://www.jstor.org/stable/24102069>.

² Remote Sensing, OMNI SCI (Mar. 17, 2021), <https://www.omnisci.com/technical-glossary/remote-sensing>.

³ What is Remote Sensing? The Definitive Guide, GISGEOGRAPHY (Oct. 29, 2021), <https://gisgeography.com/remote-sensing-earth-observation-guide/>.

⁴ supra n. 2.

⁵ 100 Earth Shattering Remote Sensing Applications & Uses, GISGEOGRAPHY (Oct. 29, 2021), <https://gisgeography.com/remote-sensing-applications/>.

⁶ See, http://www.esa.int/Our_Activities/Observing_the_Earth/Copernicus.

⁷ United Nations General Assembly, Principles Relating to Remote Sensing of the Earth from Outer Space, adopted on December 3, 1986, Principle II.

⁸ The Saga of Indian Remote Sensing Satellite System, ISRO, <https://www.isro.gov.in/saga-of-indian-remote-sensing-satellite-system>.

⁹ Hemayet Hossain and Elizabeth McNabb, 'GIS and Remote Sensing for Transport, Land Use, Site and Landscape Planning', 1, pp. 1-2 (2004), <https://www.jstor.org/stable/10.2307/26148863>.

yield or environmental impacts and modelling of surface water drainage patterns, etc of which some are already being used in Africa.¹⁰ One of the early applications of GIS was in the field of transport engineering. GIS is now also being used to make better decisions in regard to transport network planning and management around the world and includes road, rail, water, and air transport. It is estimated that more than 80 percent of the information used in transport management has a spatial component. GIS data also helps to identify accident locations, and road networks can be optimized using data intelligence. This intelligence helps to improve road safety measures and allows better traffic management.¹¹ One of the major uses of GIS has been in land use planning and zoning. Most local governments, whether urban or rural, use GIS to formulate land use plans.

With respect to India, the Ministry of Earth Sciences in 2011 submitted a National GIS Programme and Vision to the Planning Commission, which was eventually included in the GOI Planning Commission Twelfth Five Year Plan (2012-17). India has recognized that a strong organizational framework is essential for bringing focus and for institutionalizing National GIS and promoting geospatial technology use by government, enterprises, and citizens.

The National Informatics Centre, as a part of the National GIS Mission, created a Multi-Layer GIS Platform named "Bharat Maps" which depicts core foundation data an integrated base map service using 1:50,000 scale reference data from Survey of India, ISRO, FSI and RGI. This encompasses 23 layers containing administrative boundaries, transport layers such as roads & railways, forest layer, settlement locations etc., including terrain map services.

Recently, the Department of Science and Technology launched three online applications to enable users to easily purchase and download products related to geospatial mapping online.¹² They are namely

- (a) **Survey of India (SOI) GEO Spatial Data Dissemination Portal:** The portal provides a range of digital products like Digital Geographical Map, Railway Map, Political Map, Digital Geographical Road Map, Digital Geographical Physical Map of India, Open Series Map Scale, and so on to citizens of India.
- (b) **SOI's SARTHI:** WEB GIS application: This will bring Geographical Information System into the hands of the people and save time and resources in data validation with audit trail. This will facilitate SVAMITVA (Survey of villages and mapping with improvised technology in village areas).
- (c) **MANCHITRAN Enterprise Geoportal of National Atlas & Thematic Mapping Organisation (NATMO):** This geo-portal showcases the huge, authenticated, and valuable data that NATMO acquired during its long 65 years' service. Users can see, download and give feedback about the maps and atlases and different geo-spatial data layers.

India has also liberalized its Geospatial Data policy and opened access to its geospatial data and services including maps for all Indian entities.¹³ Earlier, companies needed government approval and licenses to produce, change or disseminate such geospatial information. This would often involve long waiting periods and red tape.¹⁴

The update represents a major change in the country's mapping policy, which earlier required individuals and companies to seek approval for use of mapping data under the Geospatial Information Regulation Act, 2016. This move would help various sectors as high-resolution maps as well as spatial data are central for improvement of public sector services as well as introduction of smart cities and advanced transport systems.

There is likely to be an increase in public-private partnerships with the opening of this sector with data

¹⁰ Societal Benefits of GIS and Remote Sensing in Africa, GEOSPATIAL WORLD (June 11, 2014), <https://www.geospatialworld.net/article/societal-benefits-of-gis-and-remote-sensing-in-africa/>.

¹¹ Mohammad Ali Aghajani and Mohammadreza Rezaei, Applying GIS to Identify the Spatial and Temporal Patterns of Road Accidents Using Spatial Statistics, 25 TRANSPORT RESEARCH PROCEDIA 2126, pp. 2126-38 (2017), <https://doi.org/10.1016/j.trpro.2017.05.409>.

¹² PTI, DST launches 3 applications to make purchasing geospatial mapping products easy, OUTLOOK (Aug. 17, 2021), <https://www.outlookindia.com/newsscroll/dst-launches-3-applications-to-make-purchasing-geospatial-mapping-products-easy/2143251>.

¹³ John Xavier and Sowmya S, India is putting out its mapping, geospatial data available for general use, THE HINDU (Feb. 15, 2021), <https://www.thehindu.com/sci-tech/technology/india-is-putting-out-its-mapping-geospatial-data-available-for-general-use/article33842056.ece>.

¹⁴ Sravasti Dasgupta, Why Modi govt is liberalizing mapping policies & what free access to geospatial data means, THE PRINT (Feb. 18, 2021), <https://theprint.in/theprint-essential/why-modi-govt-is-liberalising-mapping-policies-what-free-access-to-geospatial-data-means/606574/>.

collection companies working with the Indian government on various sectoral projects.¹⁵ The government expects an increase in investment in the geo-spatial sector by companies, and also an increase in export of data to foreign companies and countries, which in turn will boost the economy.¹⁶

GIS Technologies – Contemporary Scenario, Challenges & Opportunities

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GIS has played an important role in the cognitive living space and social development of human

society, and has also put its own requirements of spatiotemporal big data collection, analysis, application, artificial intelligence, Internet of things, mobile computing and cloud computing etc giving scope for new

opportunities for GIS. These will have tremendous Impact on the restructure of the government, GIS industry, and education.

In recent times GIS has undergone great changes in data acquisition, data management, technology platform, products, solutions and services. Traditional methods of surveying and mapping have given place to new ways of data acquisition such as drone based sensors combined with the power of computing onto palmtop devices. Professional education plays a key role and only through the systematic education and upgradation of skills can continuously cultivate professional talents. We have a long way to go in terms of higher education of geographic information and the report of the Task Force of MHRD (2013) gave detailed requirements at each level.

Dr. Swarna Subba Rao
**Former Surveyor General of
India**



Geospatial Activity	Survey/ Mapping/ Trained skill- workforce	Trained workforce for Survey/Mapping, Geo- database and GIS Apps	Educated professionals for Survey/Mapping, Geo- database and GIS Apps	Trained users development who would be users	School-level awareness
Present Availability Estimate	~15000-20,000	~6000-10000	~800-1200	~25000-50000	NA
Estimated Additional need by end of 2015	~20000 @4000- 5000 per year	~15000 @~2000-3000 per year	~5000-8000 @ ~1000-1500 per year	~500,000 @ ~50- 100K per year	Estimated in phased manner thru NCERT/State School Boards
Knowledge/ Skill- interventions required	Industrial Training in specific Geospatial Operations (2-4 weeks)	In-depth specialised training in operations/ management (3-12 months)	4-Year Graduate/ 2- Post- Graduate/PhD in Geospatial Technology thru University	User Training on specific GIS apps operations (1-2 week orientation)	Basic chapters in 9-12 science curriculum; Additional GIS Kit knowledge exercises
Min Qual for knowledge/ skill interventions	10th OR 12th Grade school	Graduate in Science/Arts Or Diploma in Comp Apps	12th Grade leading to BTech/ BTech leading to MTech/PhD	Basically a Geospatial technology user in Central/State governments	School at 6-8 AND 9-12 Grade
Knowledge Credits	Professional Certificate	PG Diploma	BTech OR MTech OR PhD	Applied Certificates	Proficiency Certificate

¹⁵ Esha Roy, Why is India opening up the Geo-spatial sector? What impact will this have? Explained: Why is India opening up the Geo-spatial sector? What impact will this have?, INDIAN EXPRESS (Feb. 22, 2021), <https://indianexpress.com/article/explained/explained-why-india-is-opening-up-the-geo-spatial-sector-7190149/>.

¹⁶ Bulbul Dhawan, New geospatial policy in India: How liberalised geospatial data will help private Indian entities, FINANCIAL EXPRESS (April 23, 2021), <https://www.financialexpress.com/lifestyle/science/new-geospatial-policy-in-india-how-liberalised-geospatial-data-will-help-private-indian-entities/2238865/>.

Geo AI

Geo AI is a new research and application field combining spatiotemporal big data analysis and artificial intelligence technology and it involves the geospatial data preprocessing, simulation modelling and scenario-based optimization approach. It has a number of applications in resource allocation and management whether it is urban planning, infrastructure for EV charging, disaster management and conduct of elections.

Spatial big data and spatiotemporal cloud computing

Spatio temporal data will be of different types of data; structured, semi-structured, unstructured; adapting to different data production methods. We would be needing large storage systems Thus scalability of data formats will be an important factor. Computing power in the cloud for advanced applications such on-line analytical processing (OLAP) is yet to be achieved to perfection for real-time processing of data. It is a challenge to present the data to users for decision support in an intuitive way for complex analysis.

Emerging Applications of new GIS domains

Using big data, Internet of things, cloud computing and other new technologies, the new GIS field has gained more application scenarios. Spatial big data has Multi-source heterogeneity, Multiple spatiotemporal scales, Multi centre based, and Multi dimensional Smart city is one example which include systematic process of BIM/GIS integration for applications such as intelligent transport systems, fire response management, traffic noise assessment, flood damage assessment and indoor route planning.

The UK Geospatial Commission has identified eight emerging technologies that could impact the geospatial industry and grow UK economy viz., Cameras, Imaging and Sensing, Unmanned Vehicle Systems and Drones, Survey, Measurement and Scanning, Artificial Intelligence, Smart Sensors and Internet of Things, Immerse Technologies Simulation, Connectivity

Geo DSS

There is increased use of GIS in decision making both at governmental and individual levels. The projects of Government of India such as Swamitwa, Gati Shakti heavily dependant on GIS. "Knowing where things are,

and why is essential to rational decision making" – Jack Dangermond . GIS based decision making is an important component of electronic service delivery. It will help in taking more informed decisions leading Strengthening of governance, Enhanced transparency an Improvement in citizen service. Currently we are extensively using GIS in Mapping

Telecom and Network Services, Accident Analysis and Hot Spot Analysis, Urban planning, Transportation Planning, Environmental Impact Analysis, Agricultural Applications, Disaster Management and Mitigation, Navigation and Flood damage estimation etc.,

GIS is also extensively deployed in Natural Resources Management, Banking, Taxation, Assets Management and Maintenance, Planning and Community Development, Dairy Industry, Irrigation Water Management and Pest Control and Management etc.,

Legal and Policy issues

All the above raises many legal and policy issues such as Growing awareness within governments, Funding in a changing world, Open Data, Licensing, pricing and data 'ownership', Data privacy, data ethics and cyber security, Disparities between technological advances and the legal and policy frameworks.

Government of India has, recently in February 2021, taken bold and revolutionary policy measures of unshackling geospatial data which will pave way for rejuvenating Indian geospatial ecosystem.

Challenges

- Skills requirements and training mechanisms Skills and capabilities for effective organisations. Education and advocacy
- Open science and collaboration Enabling diversity at work
- The role of the private and non-governmental sectors Making mapping available to the masses The future role of the Private Sector Regenerating the business ecosystems The future role of VGI and crowdsourced geospatial data
- Coordination and collaboration. Bridging the gap between the public and the private sector Rise of innovation-based incubation Digital Natives: The future user of geospatial information The future role of governments in geospatial data provision and management

- Beyond NSDI
- Mapping the Ocean: Marine geospatial information
Maintaining an accurate, detailed and trusted geospatial information base
- The impact of change: Adapting to alternative sources for data collection

Opportunities

As per the recent report (Geospatial Artha, December 2021), it is expected that GIS will be Rs 79,810 crore market with a requirement of 18,00,000 employees to be deployed for

- GIS
- Positioning & Geodesy
- Remote Sensing
- SDI

- Data Monetisation
- Products
- Solutions
- Services
- Technology Development (Drones, AI & ML, Crowd sourcing etc)
- Data Acquisition
- Data Management
- Data Dissemination
- Capacity Building
- Outreach



SUBMISSIONS BY ATTENDEES

As part of the webinar series conducted in 2020, the attendees have submitted papers and short write-ups as part of certification. The participants who submitted the write-ups or notes or articles were awarded Certificate of Participation. This part of the Newsletter has few selected writings.

A POLICY NOTE ON SELF-SUFFICIENCY IN DEFENCE SECTOR

- Manikanda Prabhu J, IV year
Tamil Nadu National Law University

The law and policy on the public procurement framework is constantly evolving in the modern state, especially in India, where a major transition from the 'state-only' to 'private' and 'public-private' is under-process. Public procurement can be best understood to mean when the government becomes a buyer of goods and services for its own use or otherwise, this includes the state and instrumentalities of state¹ not only in the wider sense of Article 12 of the Constitution² but may also include some other agencies of the state which may not squarely fall within the constitutional provision and the parameters set by the Supreme Court.³ In other words, "Public procurement has been explained as the purchase of goods and services by governments and state-owned enterprises. It encompasses a sequence of related activities starting with the assessment of needs through awards of contract, contract management and final payment."⁴ In the larger scheme of public procurement, the spending on the defence of the state finds a special mention for its immense significance and the intersectionality with trade and commerce, ports, foreign relations etc. The defence sector is one of the key public expenditures of the government, 4.71 lakh crore of the total expenditure in the Union Budget 2020-2021. The inadequacy of the defence spending is an altogether different debate warranting an elaborate study on merits, clearly outside the scope of the present article. But an important question is whether what the government spends in the limited resources for the defence sector is economically efficient. The excessive reliance on defence imports not only affects the strategic interests

but also the economic interests of the country.

Under the 'Make in India' banner, the defence sector gained attention since its implementation. As an extension of the same in Atma Nirbhar Bharat, firstly, separate budget for the made in India defence procurement, secondly, policy to steadily increase the FDI and thirdly, the negative import list. The call for a "Self-Reliant India' or the Atma Nirbhar Bharat campaign resembles the Make in India initiative launched six years ago and resonates the necessity of not only the narrow aspects of what is called import substitution but to truly attract foreign direct investment and make the country a favoured destination for manufacturing along with securing its place as an important stakeholder in the global supply chain. This requires a balanced approach towards both the consumption and exports driven growth that builds upon the domestic capacity of the industries to innovate and collaborate with high end technology. The asymmetry against the objectives of this campaign is seen highest in the defence sector of the country, this as India is drubbed as the second largest importer of arms in the world, next to only Saudi Arabia and the only country amongst the major militaries of the world that imports arms on this scale. There are multiple factors that require an immediate policy shift to build a sustainable and resilient defence ecosystem in the country. History has shown us various problems associated with the sole reliance on Russian arms and the problems associated with maintenance and spares, the spree of emergency purchases to bridge the shortfall of arms connected to both absent domestic industry and complex defence procurement policy, logistical and maintenance problems in keeping the diversified fleet of weapons and systems from US, Russia, France, Israel, South Korea, Germany, UK and Italy integrated and operational at all times and the high cost of these imported systems that makes India a retail buyer and shows visible effects on trade deficit and huge spending of foreign exchange.

India has tremendous potential and the development of indigenous defence equipment must be made a priority,

¹ Ajay Hasia v. Khalid Mujib Sehravardi, (1981) 1 SCC 722 (para 9); See also Pradeep Kumar Biswas v. Indian Institute of Chemical Biology, (2002) 5 SCC 111.

² INDIA CONST. art. 12.

³ Supra note 1.

⁴ See SUE ARROWSMITH, JOHN LINARELLI, DON WALLACE, REGULATING PUBLIC PROCUREMENT NATIONAL AND INTERNATIONAL PERSPECTIVES 1 (Kluwer Law International, 2000); R. Girish, Law and Development: Public Procurement Law to ensure transparency and fairness in the procurement by Government, 5 GJLDP (July) 59, 62 (2015).

in this direction the negative Import List announced by Ministry of Defence on 101 items, the changes made in the Defence Procurement Policy, the Strategic Partnership model and the setting up of an export target of 5 billion USD are a welcome move. This has given a clear picture to the domestic industries to understand the requirements of the Indian Armed Forces in short and long term, so that necessary research and development of technology is undertaken and equipment is manufactured domestically. The laudable developments of missile technology in the Agni series, Prahar, Pralay, Prithvi, Nirbhay, Submarine Launched Ballistic Missiles (SLBM) K series, Naag Anti-Tank missile, Astra Beyond Visual Range Missiles, Pinaka and Akash Air Defence System and Brahmos. In aviation, we have the indigenous Tejas Light Combat Aircraft (LCA), Light Combat Helicopter (LCH), Rustom drones, Basic Trainer Aircraft HTT 40 and the future programs of Medium Weight Fighters (MWF) and Advanced Medium Combat Aircraft (AMCA). We have seen the development of indigenous Main Battle Tank Arjun, bullet proof jackets, ballistic helmets, Armoured Fighting Vehicles, Artillery systems such as the Dhanush, AESA radars, Air Independent Propulsion systems apart from building state of the art Offshore Patrol Vessel, Submarines, Destroyers, Corvettes, Torpedoes, Radars and Surveillance systems such as the Swathi radar which have already been exported to friendly countries. The need of the hour is to bring pace and wider participation in the development of these indigenous systems and the private sector has an enhanced role to play. Transfer of technology and collaboration with the market leaders will help the domestic industries for capacity building and ensure that they are equipped with the facilities for manufacturing cutting edge technology. Also, the state-owned enterprises such as Hindustan Aeronautics Limited and shipyards including Cochin Shipyard Limited, Mazagon Dock Limited, Goa Shipyard Limited, and Garden Reach Shipbuilders amongst the others must be overhauled and steps must be taken to increase the competitiveness and sustained funding for research and development.

The above discussion concerned the goal and need for trimming down the excessive reliance on exports and the

measure of a negative import list of defence equipment. On the other hand, there is an opportunity to become a manufacturer of defence equipment. The series measures including the corporatisation of Ordnance boards, increased involvement of private sector, relaxation of regulatory controls in the sectors of defence and even the space technology, are in the direction towards becoming a defence manufacturing hub. In fact, we are late to catch the bus but we haven't missed it yet. With the sheer size, volume and finance of the Indian defence market it should be an operational advantage for the manufacturing companies. The Prime Minister had called for an 5 Billion Dollar defence exports target in the next five years, this is very much realistic provided the de-regulatory and de-control measures, roping in more private participants not limited to the big and deep pockets, collaborative efforts from the traditional public sector defence manufacturers and nascent entrants. The figures are positive in this regard, from 4682 INR crores in 2018 to a whopping 10,745 INR crores in 2019;⁵ At this rate the five-year target is within the reach. But this cannot be viewed singularly but in the whole picture of both imports and exports, without a drastic and steady reduction in the defence imports the dream five-year target becomes abysmal. Thus, the movement must be both, downward imports and upward exports curve. Having said that, the capacity building in the private sector is also the responsibility of the government, by extending financial, technology and regulatory support. The bulk of technology and expertise are stuck with the traditional public sector, there is an imminent need for an intra-technology transfer/sharing mechanism to private sector units, including MSMEs. The success story of the shipyards must be replicated in the Ordnance Factories and HAL, where missing the deadlines has become the norm. The competitive spirit in the organisation is the key in utilising the existing capacity to its fullest potential, further expansion and upgradation of technology to the international standards. The recent move to free-up space technology for the entry of the private sector is a timely move. The Indian missile technology is highly respected and has achieved international recognition.

The twin objectives of self-sufficiency and export of defence equipment must be the new norm and the long-

⁵ Angad Singh, Taking India's defence exports to \$5 billion, THE OBSERVER RESEARCH FOUNDATION (Mar. 23, 2020) <https://www.orfonline.org/expert-speak/taking-indias-defence-exports-to-5-billion-63599/>

term objective, for which there needs to be a combined, collaborated and cooperative approach between the government, private-public sector enterprises and the Indian Armed Forces. The author takes this opportunity to propose that the structural changes discussed throughout must not only be limited to the various policies surrounding the defence procurement/export but must also extend to the concrete legal framework. The law has time and again given special status to various sectors such as infrastructure, banking and finance, IFSC Company, start-ups. On the same lines, the defence manufacturing units must also be recognised for availing legal benefits including tax, land and other benefits; this is apart from the oft-used term of strategic sector. The existing defence corridors can be the best place to start implementing this classification measure, and this will provide further certainty to the private sector in the nation's vision to be a defence leader.

BATTLE IN THE MOUNTAINS

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The 4 Indian states share borders with China and those are Arunachal Pradesh, Himachal Pradesh, Uttarakhand and Sikkim and one union territory that is Ladakh. The broader route stretches up to 4056 km. India follows the Johnson line which was formally introduced by major general John Ardagh who was the chief of military intelligence in London 1897. China refuses to accept the demarcation.

The Boarded Is Divided In 3 Sectors

- Eastern sector- Arunachal Pradesh Sikkim
- Middle sector- Uttarakhand Himachal Pradesh
- Western sector- Ladakh

There is a constant fear of war in Arunachal Pradesh Sikkim Ladakh. The Sino India war took place in 1962 which took Aksai Chin from India and China captured the Aksai chin area in the Ladakh region.

The 3 Areas Of Conflict

The Pangong lake

The lake is the world's highest saltwater lake situated at a height of 4350 km in the Ladakh region. The LAC is not

demarcated here. The lake is 130 km in Length and 5 km in breadth. 60 percent of the lake was under Chinese rule. The lake is in such a shape that it has spurs or sharp edges. These edges are called fingers, finger one starts from the west towards India and extends unto finger 8. India claims its territory up to finger 8 where China says that Indian Territory only extends to finger 2. The region between fingers 4 and 8 is called the gray zone which is 10km . This grey region is called the area of differing perceptions, this area does not belong to either of the countries. The present dispute is that China during patrolling entered the grey area and it reached up to finger 5 and did not allow India to move beyond finger 2. Between 10 and 11 may 2020 is came till finger 4.China has no military or other benefit except the land.

The Galwan PP14

The Galwan Valley is a part of the Indian Territory, which comes under the sub sector north (SSN) but China claims it to be a part of the Chinese territory. The Galwan valley is a military forward area for India which connects Aksai chin to India. This is an important piece of land for the defense of Siachen and Leh.

India started a construction of a 255 km road named Darbuk Shyok Daulat beg oldi (DSDBO) joining the Leh area to the Karakoram pass. This road runs to the north corner and lies parallel to the LAC at Aksai chin. Galwan valley has no grey area unlike the Pangong lake so in this case the Chinese army actually entered the Indian territory. China had violated their own claim as they had agreed to the line of demarcation.

Col Malikiat Singh called this a Chinese Kargil.

When the Chinese army entered the Galwan valley a faceoff took place between both the armies. About 20 Indian soldiers and around 45 Chinese soldiers died.

This kind of faceoff where both the sides have had heavy losses took place after 45 years back in 1975. In the year 1993 an agreement was signed by both the countries (Peace and Tranquility agreement). Both the countries agreed not to cause disturbance on the disputed land.

The Chinese army wants to capture the Galwan Valley because there are military advantages. Sitting on the heights of the Galwan , Chinese soldiers can overlook the DSDBO road and can directly target the Indian army.

The Hot Spring

The Chinese Army will not benefit from this area, their intrusion is just to disturb the Indian army and deviate them from the other two conflated areas.

China reason behind the intrusion

China is responsible for this pandemic and due to this the Chinese economy has faced a slow down. To deviate the minds of the locals, China has adopted the method of evoking national sentiments in them so that they can not question the government and criticize them.

China is of the view that it is a super power and can fight at multiple fronts to pursue Chinese interest simultaneously

China has a problem with the construction of the 80 km Lipu Lekh road in Uttarakhand, China thinks to be a strategic advantage to India and can be a danger to China and hence China wants to stop the construction of the road.

Conclusion

The Indian government needs to play a strong role in the current situation and stop hiding facts from the public, which is the same that the Pakistani government did during the Balakot attack. A dialogue shall be conducted in all 3 areas and that are the, Military level, diplomatic level and the broader mechanism set up. Boycotting Chinese food and throwing the Chinese product is a dense act done by the Indian public instead they could just stop buying Chinese products socially electronics. Government could also increase the tariffs of the imports from china.

CREATED TO DESTROY- LETHAL AUTONOMOUS WEAPONS (LAWS)

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Introduction

While the debate for the scope of technology that comes within the ambit of Lethal Autonomous Weapons ("LAWS") persists, Artificial Intelligence ("AI") experts all over the world agree that LAWS are a threat to human existence and they need to be banned.⁶ All concerns have been addressed effectively by AI researchers and experts. LAWS are skilled enough to operate without much manpower but at the same time not skilled enough to make humanised decisions. The technology is advanced enough for optimisation but can be compromised in a fraction of a second. LAWS put our security in a very precarious and vulnerable state.

During the Cold War between the erstwhile Soviet Union and the United States of America, there was large stockpiling of arms as both nations didn't want to be outdone in fear of being wiped out. A similar situation would occur if we do not impose a global ban on LAWS.

A Versatile Threat

The use of LAWS will not just stop at war between nations,⁷ it can be used to target specific groups or ideologies. It can be used to facilitate crime and terrorist attacks. In the hands of private parties, remotely carrying out crimes is possible and tracing the perpetrators becomes more complex. Due to elimination of manpower, decisions to activate LAWS require only a handful of people which will result in concentration of power with the people who have their hands on this technology. Baron Action's words, "Power corrupts; absolute power corrupts absolutely," couldn't have a better illustration than LAWS. Those who advocate its ban, often highlight covenants of International Humanitarian Law ("IHL") that are at risk of breach when LAWS are engaged in warfare. It includes AI technology's inability at present to effectively differentiate between military and civilians.⁸ Apart from the looming issue of threat to human lives, security of nations it also presents privacy issues.

6 Interview with Top AI experts, Future Life Institute, (Mar.26, 2017)

7 Maya Brehm, "DEFENDING THE BOUNDARY", 2017, p.11

8 Maya Brehm, "DEFENDING THE BOUNDARY", 2017, p.50

Veracity of Advantages

Arguments by those who favour the retention of LAWS include reduction in deaths⁹ but the same is implausible. LAWS technology will in fact increase the mortality rates. A major deterrent to warfare has been in the availability of recruits and the value for human life. Any military engagement by the government previously involved people and thus their accountability for citizens' lives made them only take calculated risks and conflict was minimal. With LAWS the governments that possess this technology can indiscriminately attack and increase the scale of the programme. While it is a fact that military spending would reduce, LAWS could empower governments to be autocratic and less accountable. The government can come down hard on dissenters which would quell freedom of speech and thought.

Further, there are arguments that banning LAWS would impede the advancement of AI technology. AI experts have however pointed out that the ramifications from the usage of AI can veer the general public against all AI in general. The ominous capacity of LAWS would deter AI research which is currently a thriving field. The horrific eventual consequences of LAWS is a popular subject of entertainment in the sci-fi genre with notable examples like the movies *The Matrix*, *Avengers: Age of Ultron* etc. As the masses have already been sensitised to the consequences of LAWS usage, its ban is essential to shield other AI research from stigma.

Finally, LAWS supporters wield the argument that LAWS are a vital strategy in defence measures. The use of force is always condemned under international law. However force majeure is incessantly brought into play to legitimise force. Thus, in spite of numerous safeguards in place through protocols and treaties,

human rights violations continue to occur. LAWS can be used to eliminate threats to national security but soon it may take the form of a prerogative to annihilate what we subjectively term as "evil".

Although the argument of LAWS being objective exists, the autonomy of the technology is not equipped to make rational decisions and can succumb to the prejudices of its creator.¹⁰

Indian Context

An interesting factor to note in the context with regards to our foreign relations is although China has agreed not to use LAWS, it has not refrained from committing to not produce it.¹¹ This poses an alarming situation to India due to our history of skirmishes with China. India has been actively vocal about global level talks on banning LAWS.¹² While the nation's security may be put into jeopardy by a blanket ban on LAWS, to not be hypocritical, the government needs to ban private manufacture of LAWS through explicit means. This is especially in light of Atmanirbhar Bharat, where we are promoting private investment in defence and aviation. The same shall not be misconstrued and misused for stockpiling of arms.

Conclusion

However, should we effectively ban LAWS, a dilemma shall arise should militancy and other non-governmental groups including terrorists, organised crime syndicates get their hands on this research and develop LAWS. If we can collectively address this issue, then a global ban would be feasible. Else, we would find ourselves in a situation where we are unable to contain the use of LAWS in conflicts. Hence, I cannot agree to the majority view on a blanket ban.

⁹ Shashank Reddy, "INDIA AND THE CHALLENGE OF AUTONOMOUS WEAPONS", 2016, <https://carnegieindia.org/2016/06/22/india-and-challenge-of-autonomous-weapons-pub-63856>, (Last Visited August 7, 2020)

¹⁰ Interview with Top AI experts, Future Life Institute, (Mar.26, 2017)

¹¹ Campaign to Stop Killer Robots, "CONVERGENCE ON HUMAN CONTROL OF WEAPON SYSTEMS", 2018, <https://www.stopkillerrobots.org/2018/04/convergence/>, (Last Visited August 14, 2019)

¹² Brian Stauffer for Human Rights Watch, "STOPPING KILLER ROBOTS-COUNTRY POSITIONS ON BANNING FULLY AUTONOMOUS WEAPONS AND RETAINING HUMAN CONTROL", 2020, <https://www.hrw.org/report/2020/08/10/stopping-killer-robots/country-positions-banning-fully-autonomous-weapons-and>, (Last Visited August 10, 2020)

CREATING LEGAL SPACE: NEED FOR A SPACE LAW IN INDIA

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Introduction

Space law can be described as the body of law governing space-related activities. Space law comprises a variety of international agreements, treaties, conventions, and United Nations General Assembly resolutions as well as rules and regulations of international organizations.¹³

Space law has always been a topic of discussion. The technology is advancing rapidly, and there has been an urge invariably to implement such a law, as the activities associated with space have expanded both internationally and domestically. This expansion urges for the implementation of a space law domestically to enhance private participation in the space. As the role of independent operator advances, the scope of the 'Space Market' in India also eventually progresses. It may ultimately pave the way to open up to the business in the space. For this to be successful, India has to lend a good share of its economy to increase the percentage of Gross Domestic Product towards space, which currently is 0.09 percent. The aforementioned would be feasible only if India progresses to the sun used up in private commercial participation, rather than the amount that the government can spend towards the field of space.

Need for a Space Law in India

There is a necessity for a codified Act, to administer the activities, and to supervise the issues that emerge in the due process. For a developing country like India, with swiftly advancing technology and correspondingly rising population, there has always been an obligation to formulate a codified law in the field of space. The exploration into space would embark or pave a new way towards unlocking the privatization of the Space sector, which would encourage private investors to invest in this

venture. It would be achievable only if appropriate law happens to be formulated. For example, countries like Luxembourg, the United States of America, and Japan which has codified statutory Act guiding the space laws, would support individual participation in the space sector. This would prevent these private participants from exploiting accessible opportunities. Satellite Navigation service is an emerging satellite-based system with commercial and strategic applications. Satellite Navigation (SATNAV) has revolutionized the navigation world. Large service volume and all-weather capability provide varieties of applications.¹⁴ Space Application Centre (SAC) is currently accomplishing Indian Regional Navigation Satellite System (IRNSS), and the GPS Aided Geo Augmented Navigation (GAGAN) systems. GAGAN is an initiative that originated jointly with the Airport Authority of India (AAI). GAGAN endeavours to render reliable information for its application in Civil Aviation. This information remains accurate to a great extent and eases the work of Air Traffic Management. When these are accomplished, it further enhances the internal operation of aviation such as fuel-saving, flight safety, the effectiveness of data and information, augmentation of reliability, decrease in workload for operators, increase in air space capacity, cost-effective equipment, coverage of the oceanic area for air traffic control, high position accuracy, etc. Apart from the Aviation sector, GAGAN may be an aid to the sectors of Railways, Scientific Research on Atmospheric studies, Natural Resources and Land Management, Mobile Networks, etc. A product of GAGAN known as GEMINI (GAGAN Enabled Mariner's Instrument for Navigation and Information) is another breakthrough that benefits fishermen advising on the climatic conditions and warnings them at the time of floods. These are achieved through a device known as the Global Positioning System (GPS). This has proved to be a lifesaver for these people. When such tremendous opportunities are available it would be highly beneficial, would earn tremendous revenues, as well as would be a huge development for the country if private participators would lend their hand into space, and for this to be

13 Space Law, United Nations Office for Outer Space Affairs (UNOOSA): <https://www.unoosa.org/oosa/en/ourwork/spacelaw/index.html>.

14 Satellite Navigation, ISRO-SAC <https://www.sac.gov.in/Vyom/SatNavApplications.jsp>

resolved, a Codified act is very much essential to regulate this participation.

Space Law Treaties

Primarily when we take the international perspective, there have been few treaties that deal with space. Some of them are The Outer Space Treaty, Liability Convention, Registration Convention, The Moon Treaty, and The Rescue Agreement.

The Outer Space Treaty

The Outer Space Treaty is a hundred-and-ten-member parties' treaty that has both signed and ratified the treaty. Twenty-three more member countries have signed the treaty but have not ratified it. This treaty states that space belongs to all the nations and that no one nation can claim over a celestial body in space. Similarly, no government can claim the moon to be their own and in the same way, no one country can claim a planet to be their property. It also does not allow the handling of nuclear weapons in space.

The Rescue Agreement

The next is The Rescue Agreement that fundamentally deals with the rescuing of astronauts or other persons in space. It asserts that assistance and help must be provided to the persons in the spacecraft who have landed in their country because of an accident or due to any emergency. This treaty has been signed and ratified by ninety-eight countries as of now. Twenty-three members have only signed but have not ratified it.

The Space Liability Convention

Following is The Space Liability Convention. It states that when a country launches any kind of Space Object, then that particular country is thoroughly held responsible for any kind of destruction that Space Object creates. And hence, the damage caused because of that Object would be laid upon the country that launched it, and that country will have to take responsibility for that damage and will be held liable for the same. This liability is the major concern of the Space Liability Convention.

The Registration Convention

The subsequent convention is The Registration Convention. Sixty-nine countries have ratified, and three countries have signed but have not ratified it. It states

that when a Space Object is launched, all the necessary pieces of information must be given to the United Nations (UN). All the records of launches of various countries are maintained as a register by the United Nations Office for Outer Space Affairs (UNOOSA). UNOOSA contributes a framework for such launch activities and also assists in the implementation of all these treaties. It further helps countries to venture toward space activities.

The Moon Treaty

The next treaty is the Moon Treaty. This treaty has four countries that have not ratified and have eighteen countries that have ratified the treaty. This treaty has twenty-one articles. It has a few provisions which assert that nuclear weapons cannot be used, all the countries have the freedom to research the moon and other space resources, no country should harm any space object and no country should try to affect the environment of the space. The main purpose of this treaty is for maintaining peace amongst various countries over the subject of activities regarding the moon and other celestial bodies. This treaty also states that spatial resources and its investigation are for everyone and no particular country can claim its sole ownership over the space.

Conclusion

Due to the visionary approach of scientists such as Dr. Vikram Sarabhai, Dr. A.P.J. Abdul Kalam, and other such scientists, India could achieve a humongous breakthrough in the field of space by accomplishing missions such as Mangalyaan (Mars Orbiter Mission), and Chandrayan-I. With such advancements in our understanding, we would prefer to summarise our article into asserting that India progressing toward rapid development in the area of Space, and its sequential effect on other areas such as Aviation, Fisheries, Networks and Towers, and the developing scope concerning private participation, there has always been an urgent requirement of codified law, and this could be achieved only if the government paves the way to avail new opportunities such as space exploration, unlocking private participation in the space, and assist the organization through the funding of private commercial participation.

CRITICAL ANALYSIS OF DEFENCE SECTOR IN INDIA

Sidrah Jami

INTRODUCTION

The Indian Armed Forces are the voluntary forces that are increasing rapidly in the world. It consists of the third largest force in the world. It has about reserved and paramilitary forces which consists of 3 million male and female officers. An important feature of the Armed Forces is the degree of participation of the military in higher politico- military decisions in times of war or peace settlement. There is also a low degree of integration between three service arms. The joint service commanders only have authority in nuclear weapons and defense of the Andaman Islands.

INDIA'S DEFENCE ORGANISATION

The defense and security sector in India includes various ministries and government functions, intelligence agencies, Armed Forces of India and paramilitary formations. The Indian Administrative Services (IAS) dominates the areas of defence and the security sector in the country. The IAS bureaucrats are found at various posts at the Ministry of Defence. The fiscal matters that are shaped by IAS personnel are found in the Ministry of Commerce and the Ministry of Finance. The Indian Foreign Service (IFS) holds posts and handles matters which are related to Indian Foreign Policy. There is mostly a competition between IAS and IFS. The Supreme Command of Armed Forces is president but the cabinet with the Prime Minister is the head who is responsible for the national defence. The Cabinet Committee on Security (CCS) is the top formulation body in the defence area in India. It comprises the ministers for defense, finance and the internal affairs of the country. The chief takes part in the active decision making in the country. The CCS participates in the decision-making process. The Cabinet Secretariat, ministries, intelligence agencies and National Security Council (NSC) also play a crucial role in it. The CCS gets their input from the armed forces via the Ministry of Defence. There is no proper military representation therefore the service chiefs are allowed to give advice in the matters. The CCS is a superior body to NSC. NSC is an advisory function. It is a government's primary coordinating body

which looks after the security matters. NSC consist of a prime minister, the deputy chairman of planning, the ministers for home affairs, finance, external affairs, and defence, the three service chiefs of staff, and the national security advisor (NSA). THE NSC Advisory Board drafted a first nuclear doctrine.

The Ministry of Defence is the main Cabinet Ministry which looks after the defence matters of the country. It provides a policy framework and directions for government policy on all security and defense related matters to the Service Headquarters, the inter service and research and development organizations. It consists of four different departments- – Department of Defence (DOD), Department of Defence Production (DDP), Department of Defence Research & Development (DDR&D) and Department of Ex-Servicemen Welfare – as well as a Finance Division. The Ministry of Finance also plays a crucial role in defense matters. The armed forces are offices and functions which are attached to the Ministry of Defense. The Chiefs of the Staff Committee (COSC) is the tri-service coordinating body which provides advice to the ministry of defence. It also advises the Cabinet through the ministry of defence. It is composed of three chiefs of staff for the Army, Air Force and Navy. COSC uses its Head Quarters of the Integrated Defence Staff (HQIDS), as a new function. The head of the Integrated Defence Staff (IDS) has the title Chief of Integrated Staff to Chairman, Chiefs of Staff Committee. He heads the IDS and helps in the functioning and supporting the COSC.

THE ARMED FORCES AND SERVICES MODERNISATION

The Indian Armed Forces has 1,288,000 active troops, 1,155,000 reserves and 1,300,586 paramilitary forces. India has the third-largest active force after China (with 2,185,000 active troops) and the United States (with 1,540,000). In recent years, and especially since the gradual warming of relations with Pakistan after the 2002 crisis, the Indian Armed Forces have been able to shift the focus away from Pakistan. On the strategic level, countering China's military build-up has been a major thrust. There has been a process of transforming the capability of the defensive border formations. Independent offensive capability through stand-off weapons, information superiority and precision strike

assets has been prioritized. The objective has been a strong conventional deterrent force that supplements the nuclear deterrent of India.

In the north-east India region of Arunachal Pradesh, airfields have been opened and the construction of infrastructure in support of the defensive border formations has accelerated. These are projects that increase operational efficiency, the sustainability of the formations, and the capability to insert additional formations into the areas opposite China. Improving strategic reach capability by the Air Force has been critical. Maritime security in the Indian Ocean has been another focus. India's vital interest in expanding its influence into its immediate maritime surrounding areas, its vital interests in transport and the will to be able to counter Chinese maritime competition in the Indian Ocean have spurred a naval modernization and build-up. This naval modernization is coupled to the overarching push to acquire force projection and out-of-area operations capability. Several key modernization programs such as aircraft carriers, nuclear-powered submarines, a long-range strike capability, troop carriers and so on point in this direction. The ambitious modernization plans and re-focusing of the Armed Forces have yet to produce a substantially improved national military asset. There are several problems that have been pointed out by many analysts. Continued reliance on large quantities of inferior matériel, from battle tanks that lack night capability to inferior equipment in the Special Forces, has been a constant grievance. The problem of operational efficiency posed by the lack of service jointness and synergy has been another monumental issue of concern. A third problem has been that of service personnel exhaustion due to extensive deployments on internal stabilization missions and COIN (Counter Insurgency) campaigns within India itself. These are only some of the problems that were already being discussed before the 2008 Mumbai attacks. The terrorist attacks in Mumbai exposed highly troubling shortcomings of the Indian Armed Forces that have since led to yet another shift in the focus of service modernization and force reformation. First of all, perceived Pakistani involvement in the attacks has led to the focus again gravitating towards the threat posed by Pakistan. What in India was perceived as a return to the

irregular methods used by Pakistan against India so many times has triggered thinking on how the combination of Pakistan's superior strategic focus should be countered. National intelligence-armed service coordination did not work. The Indian Navy failed to find the terrorists in spite of having information about their whereabouts from the national intelligence organization. The Special Forces did not perform up to standard due to equipment shortages, lack of proper training and poor organization. In a broader sense, the Armed Forces failed to respond in a coordinated and decisive manner. This cast into serious doubt the claimed "full spectrum" operations capability, from special operations and counter-insurgency to fighting a conventional war to nuclear war.

The Army

The Indian Army is the largest service branch in India. It consists of five regional commands:

- Central Command at Lucknow
- Eastern Command at Kolkata
- Northern Command at Udhampur
- Western Command at Chandimandir
- Southern Command at Pune

The Indian Army likens the commands "to a Field Army or an Army Group Headquarter with a General Officer Commanding-in-Chief many divisions under them. The Army has been given many tasks in defence matters. The army not only looks after the external boundary cases but also looks after the internal security functions in the nation. I should be skilled with many different operational and tactical concepts. They should have skilled knowledge about the Large-scale mechanized warfare, high mountain operations, low-intensity asymmetric warfare and counter-insurgency operations.

The Air Force

The Air Force has 125000 troops with 565 combat aircrafts, 785 transports, trainers, reconnaissance aircraft and helicopters 81. India is in the top five air forces in the world with 1350 aircrafts. The Air Force has 96 fighter aircraft, 392 fighter ground attack aircraft, 237 trainers, 261 transport aircraft, three AEW/AWACS (airborne warning and control system aircraft), six

tankers, and 20 attack and 258 support helicopters. It has embarked an immense amount of change in the world in 2000.

The Air Force has five operational commands:

- Western Air Command at New Delhi;
- Southwestern Air Command at Jodhpur
- Eastern Air Command at Shillong
- Central Air Command Allahabad
- Southern Air Command at Thiruvananthapuram

Two functional commands, a training centre and a Maintenance Command also exist. Squadrons play an important role in the Air Force. India has moved from 32 to 34 squadrons. They have different types of aircraft like fighter, bomber, transport, communication and reconnaissance. The Maintenance Corps that provides in help of storage, custody, maintenance of supply, and repair and overhaul of Air Force equipment. There are various training units, and command and control units. There are a number of aircraft fleet in the Indian Air Force like Soviet MiG-21s, Mig-23BN/UMs, MiG-27s, MiG-29s and Sukhoi-30s together with British/French SEPECAT Jaguars and the French Mirage 2000. The Su-30s and the Jaguar are licence-built in India. The Air Force has thus proved that it provides a large capacity airlift organization in defense related matters. The An-32 fleet and Il-76 has served the purpose in India and are now in the process of upgradation. India also has a number of different types of aircrafts in the transport fleet like BAE HS-748, Do-228, B-707 and B-737.

The Navy

The Navy is another important factor in India's defence sector. There are 131 warships presently in India. It includes one aircraft carrier, 48 other major combatants and 16 submarines. It is one of the five largest navies in the world. The ships are operated from two important ports in India, Mumbai and Visakhapatnam. India has the latest aircraft in India. One squadron (15 aircraft) of Sea Harriers is essential in the naval force. The largest naval function is anti-submarine force. It consists of six squadrons (60 helicopters). India has constructed many ships of local designs and sufficient shipyard capacity. The Navy also possesses modern dockyard facilities.

The Navy force is increasing rapidly but some of its technology is outdated. The government implemented the new ten-year modernization policy to look after the issues and problems in forces.

MODERNISATION PROJECTS

India decided to spend a huge amount of money for the upgradation and modernization of materials in all three organizations under the defense sector. Modernization focuses on buying weapons that have proper firepower, speed, surveillance, maneuverability and command and control. The Army Artillery: The Indian Army is possessing artillery guns. They are of different categories like the ultra-lightweight 155mm air liftable field gun or a light-weight self-propelled 155mm howitzer. UAVs: The Indian Army has also possessed a bulk of small unmanned aerial vehicles (UAVs) both for intelligence gathering and which can be used in a "killer" role.

Air defense: The Indian Army is also trying to upgrade its air defence by buying missiles and guns.

Amour: The Indian Army is also modernizing its armoured force with the T-90 battle tank and upgrading the T-72 tanks with new thermal imagery.

Helicopters: The Indian Army also focused on replacing the 1970s-vintage Army and Air Force aviation helicopters into new helicopters.

Anti-artillery radar: The Indian Army has also acquired new weapons with locating radars which can be used to track down and locate the enemy artillery

Tactical communications: The Indian Army has also focused on replacing the 1980s vintage system into a new tactical communication system.

The Navy

The Modernization policy envisages the production of 75 new warships to complement or to replace the old fleet of ships 131. The new ten-year plan focuses on providing funds for the alleviation and replacement of old ships into new fleets. It also focuses on buying and production of new submarines, a new frigate class, new bunker ships, an aircraft carrier and a new fleet tanker. India also bought three nuclear-powered attack submarines. These three submarines are constructed in Russia. The

Indian Navy is also trying to upgrade its airborne maritime surveillance. Under this, a three-tier system is constructed where UAVs can be used for short-range, medium-range and long-range capability. The Navy has acquired littoral warfare capability, which includes amphibious warfare ability. The Indian navy has also ordered landing craft and helicopters for defense related matters.

The Air Force

Many aircraft fighters in the Indian Air Force are becoming outdated therefore, the Indian Government has taken two measures. Firstly, the One is the acquisition of 126 medium multi-role combat aircraft, where the Swedish JAS 39 Gripen along with the French Rafale. The second measure which the government took was the signing of an agreement with Russia to develop a fifth-generation aircraft. The Indian Air Force also ordered 40 SU-30 MKIs from Russia to supplement the 60 SU-30 MKIs in India.

DISSECTING THE AWARD IN ENRICA LEXIE INCIDENT

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INTRODUCTION

It was around four thirty in the evening of 15th February, 2012 when two fishermen aboard the fishing boat St. Antony were shot dead 20.5 nautical miles off the coast of India. Several other fishermen had a narrow escape as they were sleeping on board. Of the 4 vessels that were found to be in the area at the particular time, the Indian Coast Guard and the Marine Rescue Coordination Centre, Mumbai narrowed down on an oil tanker. The shots were found to be fired by two Italian naval officers from the Italian oil tanker M.V. Enrica Lexie. The tanker was travelling from Singapore to Egypt and had just left the Kochi port a day prior to the incident. Subsequent to identification, the vessel was contacted and the Coast Guard requested the return of the vessel to join the investigation relating to the incident. The vessel was returned to Kochi Anchorage later that night.

The two Marines were arrested on the same day in lieu of the FIR filed against them at the Coastal Police Station, Neendakara, Kollam in the State of Kerala.

A similar incident happened later that year in July where the US Navy's Rappahannock took aim at a trawler killing one Indian fisherman.¹⁵ The main reason for such incidents have been the fact that a majority of merchant ships passing through the Arabian Sea hug the western coast of India to avoid encounters with Somalian pirates; making encounters with fishermen frequent. Most vessels passing through the region also weapons for self defense from pirate attacks. This trend has not only increased the cost of goods coming to India due to insurance expenses, it also disrupts the business activities of the fishermen community with the big ships coming too close to the coastline. Although killing of fishermen mistaken to be pirates has been on the rise in the past couple of years, the Enrica Lexie case, popularly referred to as the Italian Marines case, attracted an unusual amount of public and judicial scrutiny. Due to domestic pressure from both countries, there was a severe derangement in the diplomatic relations between both the countries. Protests were held in both the countries; people from Kerala demanding justice for the victims and the Italians demanding justice for their servicemen.

LEGAL ISSUES

The issue of jurisdiction was of utmost controversy as the incident did not take place in the territorial waters of India that extends up to 12 nautical miles as per the United Nations Convention on the Law of the Sea (UNCLOS). Criminal proceedings were initiated in the state of Kerala against the Marines which were eventually stalled due to the writ petitions and appeals filed by Italy in the High Court of Kerala and the Supreme Court of India. The Supreme Court of India in its decision established India's jurisdiction in the matter and prepared for trial of the two Marines. India was then served with a notification under the provisions of the UNCLOS as arbitral proceedings were instituted by Italy in June 2015. Although the Special Court set up in Delhi completed their investigation in the incident, the trial never started due to

¹⁵ Indian fisherman killed as US Navy fires in the Gulf, July 16, 2012, The Express Tribune, <https://tribune.com.pk/story/409309/indian-fisherman-killed-as-us-navy-fires-in-the-gulf> (Last Visited August 15, 2020).

the stay order obtained by Italy and the provisional measures prescribed by the International Tribunal for the Law of the Sea (ITLOS).

The main issues considered under the arbitration proceedings are inter alia: jurisdiction of the Tribunal, criminal jurisdiction of India, UNCLOS violations by India and Italy, immunity of Marines, compensation. The proceedings have since then taken place at the Permanent Court of Arbitration at Hague. On 2 July 2020, the Arbitral Tribunal published the operative part of the Award and whereas the complete Award and concurring/dissenting opinion was published on 13 August 2020 post confidentiality review by the parties.

FINDINGS

The major findings and operative segments of the Award by Arbitral Tribunal are as follows:

- The dispute concerns interpretation of the UNCLOS and hence, the Tribunal has jurisdiction over the matter (4:1)
- The Tribunal has jurisdiction to deal with the question relating to immunity of Marines (3:2)
- The question relating to compatibility of UNCLOS and Indian legislations need not be examined (Unanimous)
- India has not breached Articles 87, 92, 97 and 100 of the UNCLOS (Unanimous)
- The two Marines are entitled to immunity and India has no jurisdiction over them (3:2)
- India is to cease exercising criminal jurisdiction in the matter as Italy resumes its criminal investigation (3:2)
- Italy has not violated Articles 56 and 58 UNCLOS (3:2) or Article 88 of the UNCLOS (Unanimous)
- Italy acted in breach of Articles 87 and 90 of the UNCLOS (Unanimous)
- India is entitled to compensation for violation of Articles 87 and 90 due to loss of life, physical harm, material damage to property and moral

harm suffered by others on the fishing boat (Unanimous)

- The parties may decide the amount of compensation and in the absence of consensus; parties may approach the Tribunal for quantification of damages (Unanimous)

DISSENTING OPINIONS

There are two separate dissenting opinions by Dr P.S. Rao & Judge Patrick Robinson as well a joint dissenting opinion by both these arbitrators.

- Judge Robinson disputes jurisdiction of the Tribunal as he opines the case primarily concerns immunity and the extent of criminal jurisdiction of India, not the interpretation of UNCLOS.
- The Tribunal's decision to accept incidental jurisdiction in the questions relating to immunity was severely criticized under both dissenting opinions and has come under severe scholarly attack.¹⁶ Judge Robinson opined that the question of immunity is a core element of the dispute; therefore eliminating application of principle of incidental jurisdiction and since immunity does not concern interpretation of UNCLOS, Tribunal has no jurisdiction to decide on the same. As per Dr. Rao, not only are there questions related to requirements of incidental jurisdiction, there is also a complete lack of reasoning as to why sovereign immunity applies when the armed Marines were posted in under commercial contract and private ownership. Judge Robinson also argues that even if the Tribunal has jurisdiction, the Marines are not entitled to the same as Italy itself lacks immunity in the matter and even if the Marines were considered to be visiting forces, they do not enjoy immunity. He further draws attention to nature and purpose of the act performed in official capacity, which in this case was purely commercial. There is additionally a need to understand how and why immunity applies in the absence of bilateral or multilateral convention between the two countries.

¹⁶ Valentin J. Schatz, Incidental jurisdiction in the award in "The 'Enrica Lexie' Incident (Italy v. India)" – Part I, 23 June 2020, Völkerrechtsblog, <https://voelkerrechtsblog.org/incidental-jurisdiction-in-the-award-in-the-enrica-lexie-incident-italy-v-india-part-i/> (Last Visited August 15, 2020).

- The joint dissenting opinion of Dr. Rao and Judge Robinson also read that Italy has violated sovereign rights of India under Article 56 and disregarded the due regard obligation under Article 58 of UNCLOS. As per the opinion, the Tribunal contradicts itself as it previously determined that India did not breach any obligations under Article 100 of the Convention, thereby rendering obligations under Article 56 and 58 inapplicable to India.

CONCLUSION

The Award in *Enrica Lexie Incident Arbitration* was a much awaited one as its consequences impacted not only international law governing the sea, but also diplomatic relations between two countries. While India successfully argued that it did not breach UNCLOS and that it's entitled to compensation, Italy gained the jurisdiction for criminal proceedings and immunity for its Marines. The Award has valuable lessons for India in strengthening its extraterritorial jurisdiction and re-examining the compatibility of its legislations and UNCLOS. The Award has also brought up more questions about the legality of armed officials on private vessels under commercial contracts, legal principles governing immunity, objective territoriality principle, considerations of humanity and many more.

The root of the problem, one that the international community needs to pay more attention to, is the problem of Somalian pirates. There is a need for the international community to take stringent measures to control the threat of piracy in this rather dangerous region. This may require international organizations to take steps towards the illegal fishing and toxic waste dumping activities, since they are thought to be the root cause for the spread of piracy in the Somalian coast.

IN-SPACE WITH ISRO'S RECENT COMMERCIAL REFORMS

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The Indian National Space Promotion and Authorisation Centre (IN-SPACE) is a huge step and progression of India's space programme taken by the government and Department of Space. IN-SPACE will be an independent fourth vertical under ISRO and won't be affecting ISRO's

functioning. It intends to provide an entrance to private companies to utilize India's space infrastructure and to encourage policies towards a friendlier regulatory environment.

IN-SPACE will be an autonomous body which won't be influenced by ISRO or influence ISRO's working. Moreover, IN-SPACE in consultation with ISRO will have the power to provide testing system or facilities of ISRO to private entities, this decision shall be binding on the ISRO and other stakeholders.

However, to achieve its stated goal and to create an economic enterprise around it, IN-SPACE must make some significant changes in both the sector's culture and policy to enable the Private Space Economy of global significance.

These commercial space activities are broadly classified in two categories:

- Upstream space activities: which involves build and launch of satellites and space-intended payloads, and
- Downstream space activities: This includes distribution of dividends from assets in space to investors and consumers.

With the establishment of the New Space India Limited (NSIL) which is a public sector enterprise under the Department of Space, will work to shift space activities from a 'supply driven' model to a 'demand driven' model to ensure efficient utilization of the space assets.

ISRO is inherently a scientific organisation with its main objective being the exploration of space and launching scientific missions. It is expected that these new reforms are aimed at making ISRO more research and development oriented, exploration missions, new technologies, and human spaceflight programmes, and remove the commercial distractions.

INSPACE: Need of the Hour?

History is evident that private enterprises working in the space and Telecom sector have seen troubles with the government.

To quote a few, the Antrix-Devas case, where India was held liable for violating a bilateral investment treaty highlighted the shortcomings in bureaucratic processes

between private sector and the state.

And cancellation of 2G spectrum licenses to tackle the issue of corruption showcased itself as a fear factor for the investors and the enterprises. Slow legal proceedings aren't helping India's image either,

These conflicts between the state and the private sectors are born out of a complex regulatory regime.

The enforcement and implementation of space laws and regulation is distributed between various departments, agencies and ministries. Only some of them include:

- The Department Of Telecommunications,
- The Department Of Space,
- The Ministry Of Defence,
- The Ministry Of Home Affairs,
- The Network Operation And Control Centre (NOCC),
- The Wireless Planning Commission (WPC),
- The Satellite Division Of The Department Of Telecom, Set Up In November Of 2019 and
- The Telecom Engineering Centre (TEC).

These Agencies exercise discretion to enable and ensure commercial space activities are harmonious with India's national security interests and scarce spectrum resources. However, there is no clear policy framework to measure this discretion.

SATCOM operations: Rigid and Uncertain

There is an absence of uniformity of process in designing and launching a satellite.

- Certification of equipment by TEC.
- Securing the frequency bandwidth necessary to establish communication with satellite from the WPC
- Securing orbital slot under the channels of SATCOM Norms,
- Network certification by the NOCC,
- Securing the licenses from the Ministry of Broadcasting for the service or The Department of Telecommunications.

The absence of uniformity and long and expensive regulatory process hardly acts as a motivating factor for

the global private entities.

IN-SPACe hopefully gives us one primary regulator who reaches to the other sector regulators and brings a uniformity of process and clear timelines and cost involved to make it easier for private entities to enter the Indian Space Infrastructure.

With increased involvement of these private industries, ISRO will be more focused on science, strategic launches, R&D, and interplanetary exploration.

IN-SPACe will also promote these private players to actively engage in end-to-end space service providing, including building of rockets and launching satellites and providing space-based services commercially.

IN-SPACe will identify the national talents and skills to innovate the space sector by opening the sector for entire country and space start-ups and young entrepreneurs, along with generation of large scale employment and additional revenue for ISRO.

These reforms will lead to employment generation, attract huge FDI, and provide a competitive boost to local players in Indian and global markets by directly promoting Make in India, which will lead to a highly competitive yet healthy environment, and a market so vibrant that it will witness a huge customer benefits along with multitude increase in the government revenues.

The demand for SATCOM is further driven by the ever increasing data demand due to IoT which is reflected in the National Frequency Allocation Plan, 2018 (NFAP 2018), 5G, Digital India, Industry 4.0, smart cities, etc. Furthermore with the Covid-19 pandemic, A significant shift in the working patterns has been observed in almost all the industries. Work from Home has become a trend which has led to a huge jump in demands of internet connectivity in rural areas and increased network quality in urban areas

The government is not equipped to deliver the needs of nation or innovate the space sector without the cooperation or involvement of the private sector. Digital India in the Space Sector can only be achieved through partnership of public and private sector.

Conclusion

The SatCom policy directs the use of Indian National Satellite (INSAT) system's capacity by private and non-governmental agencies, the operations of INSAT Systems and the usage of foreign satellites for SatCom Services

The highlighted problem in the Regulation and Approvals of Space sector is the absence of a time bound manner and delays with operational interference from the government.

To ensure that the satellite communications are implemented without any obstruction, IN-SPACE provides promising concept, and also helping ISRO to grow its scientific roots. Hopefully, these recent reforms will lead to grand commercialisation of rocket and satellite manufacturing (which was exclusively vested in ISRO till now) and a remarkable increase in space activities.

IN-SPACE can be seen as the first step taken by India towards joining the master race and becoming a strong space economy. It reflects State's intention to grow and reform the space sector to be at par with emerging technology and global trends, encouraging the change in the space sector and allowing private participants to join and work harmoniously with the public sector to ensure optimum skill set in the Indian Space Sector.

IN-SPACE cultivates a partnership between the public and private sector, which may very well lead to an innovative and commercially successful space sector and ensure India's interest and participation on global scale, ultimately making an Atmanirbhar Bharat.

SIGNIFICANCE OF THE MARITIME LAWS

By Aahana Pal

When we talk about land marking our territory is easier, we simply have to gather a few people and make a fence or build a wall around it. But when it comes to water bodies several factors are taken into count since the water is not static and it undergoes seasonal changes. Therefore, UNCLOS have stated under article 7 of it that straight baselines may be constructed only in localities where the coastline is deeply indented or cut into or else where a fringe of islands lies in the intermediate vicinity of the coast. The maritime boundaries which are established under UNCLOS protocols or as the

unilateral coastal state, claim that they are mostly dependent on the geographical reference which provides a point on the earth's surface as the basis of claim initially. The marine boundary makes sure the coastal states have their exclusive national rights within the particular marine zone and get to make use of all its features within its zones but they do not cover lake or river boundaries and is limited to only oceans and seas.

With the growing population worldwide, every country is concerned about providing enough for their citizens. The countries are becoming concerned about the marine boundaries to exploit and also to explore and one of its reasons is its food. The dependence on marine resources has turned the economy of the world more inclined to the resources found in the ocean, this is known as the Blue economy. The mariners who often explore the seas and oceans for fishing and other purposes tend to be the victim of crimes which may or may not be done by them intentionally. Their action might harm the sentiment of the mariners from another coastal state. It is preferable to settle these disputes between nations as soon as possible. This is where UNCLOS comes into existence where it settles and sorts the differences and helps bring harmony among all.

There are around 512 potential maritime boundaries, but only few of them have been agreed upon by the nations mutually. Every state wants the marine zones based on their own preferences and interest mostly based on its commercial, economy and security but the investment on the marines is considered risky due to its seasonal changes which is considered risky by the energy department. The overlapping claims are being viewed by the experts but getting a common ground isn't that easy. There are also several cases which have also been settled. One of them is the dispute between India, Bangladesh, and Myanmar on the Bay of Bengal. It was finally settled by ITLOS (International tribunal for the law of the sea) and LOS (Arbitral tribunal under the law of the sea) in 2014. The dispute was due to the overlapping claims between the countries over EEZ and also their claim over New Moore island.

When a dispute such as the one mentioned above continues beyond a reasonable amount of time it is considered to be a protracted maritime dispute. The international laws come into play only if the parties agree

to involve the international court. The few reasons due to which these issues go unsettled are because of the ignorance of the citizens towards sea related issues or there is lack of expert view regarding the matter and therefore the case gets protracted. It is important that the members representing their country are good at negotiation for the matter to reach a permanent conclusion.

Under article 287 of UNCLOS, it states that the states are permitted submit a written declaration of their demands after submitting the confirmation and acceding of the matter in the international court. It often happens that at times the party at disadvantage after the judgement declines to agree with the jurisdiction. One example of this will be the maritime dispute between Bangladesh and Myanmar, where Myanmar refuse to accept the jurisdiction of the tribunal under ITLOS. There are situations where the experts fail to agree with what method of delimitation is to be used. Whether it should be the equitable principle or some other method resulting in both parties being dissatisfied with jurisdiction. There is an example of the above crisis which happened in the case of Myanmar, Bangladesh and India where Bangladesh wanted the decision to taken the basis of equitable principle while the other two countries preferred the equidistance one.

The first sea conference was held in Geneva in 1958 where around 85 states participated but through its convention the basic custom laws were transformed to international ones. This changed their focus to the opinions of the western states and their power on the sea ignoring the developing countries. Even the second sea conference failed to achieve its goal so in the third conference the opinions were taken into regard on the voting basis which led the developing countries to speak from themselves and there were around 167 states who were a part of this. Therefore, the maritime laws came into existence and decisions regarding the calculation of the maritime boundaries were decided taking everyone into consideration.

It is the law of the sea which takes into the consideration for regulating the baselines, law regarding sea its internal waters, maritime zones and deep seabed depth. Arbitration is one of the successful ways of settling disputes among nations when LOS failed.

ICJ also known as the International court of justice which comes under the United Nations has been playing an integral part after it came to power. It may also be known as the World Court which helps the Nations to coexist in harmony. The unsettled disputes between countries lead to a lot of ridge gapping between them and therefore it is necessary to seek the help of the World Court. The disputes also lead to economic gaps where the country is unable to utilize the marines be it for trade or transportation of natural gas, oil or food resources. The decisions taken in the court also makes sure, the countries don't exploit it and avail limited resources to prevent extinction of species.

MARITIME SECURITY

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Introduction

Increase in trade is a necessity for a globalized economy but at the same time concern of security comes as a part and parcel. India has a long history of maritime trade right from the period of Indus Valley Civilization that developed before 3200 BCE, stretched from the Indian Ocean to Mesopotamia and Africa in the west to Indonesia and Cambodia in the east. Even before the arrival of Vasco de Gama it was the Arabs who have coined the term of mausim i.e. monsoon coming to Southern coast of India for trade during that period, eventually the events that took place in the central India contributed in discovery of the maritime path from Europe to Indian coast and followed by the hard hit struggle of India. This is how trade and security are being connected to each other. This not only remained in the past but in the present also one needs to tighten up the security to protect the sovereignty and integrity of the nation. Indian Ocean, the only ocean in the world to be named after a country which in itself depicts the importance and the intricate relationship between India and the Indian Ocean. India have a longline boundary to guard but when it comes to security we often struck in our minds with the northern part to be specific the LOC and LAC part, the level of interest of discussion about the maritime security is not at par with the land part although India have a 7517 km long coastline to be specific 5423 as mainland and 2094 after encircling the Andaman and

Nicobar region. When it comes to maritime security we could divide the whole issue into few sections namely:-

- 1) Maritime Zones
- 2) Arms Preparedness
- 3) Legal Framework
- 4) Issues and Challenges
- 5) Initiatives

1) Maritime Zones

The core concept is the basics that one must be aware of before making an analysis hence we would be starting with the territorial extent that India has as its marine boundary as when we have to guard a house we need to first demarcate it first from others by setting and knowing the boundary. The whole maritime region of any country can be divided into 4 parts

- i) Internal Water
- ii) Territorial water
- iii) Contagious Zone
- iv) Exclusive Economic Zone

i) Internal Water

It includes the water bodies within land boundaries till the baseline and can be regulated by the coastal states. It's the region where by complete sovereignty of the country and foreign vessels have no right of passage within internal waters.

ii) Territorial Water

It extends from the base line till 12 nautical miles. Coastal states enjoy complete sovereignty and hence are free to set laws, regulate use and use any resources and the freedom of navigation to foreign vessels can be denied but the right of innocent passage can be granted. Territorial Waters is jointly surveillance by a patrolling team and marine police.

iii) Contagious Zone

It extends from 12 nautical miles till 24 nautical miles. Coastal state cannot claim to have complete jurisdiction over this region. Although coastal states can continue to enforce laws in four specific domains namely, Customs, Taxation, Immigration and Pollution. If any crime is being

committed in this region then they have to follow the International laws to solve the issue.

iv) Exclusive Economic Zone

It extends from the 24 nautical miles till the 200 nautical miles. The country has the exploitation rights over all the natural resources falling within the respective country's boundary limit and can prevent foreign states from exploiting resources however freedom of navigation is there for foreign vessels. Intermediate layers that are 25 to 50 nautical miles the region is patrolled by the ships of the Indian Navy and the Indian Coast Guard as well as hired trawlers. Beyond 50 nautical miles the region is patrolled by Indian Naval and coast guard ships and aircraft.

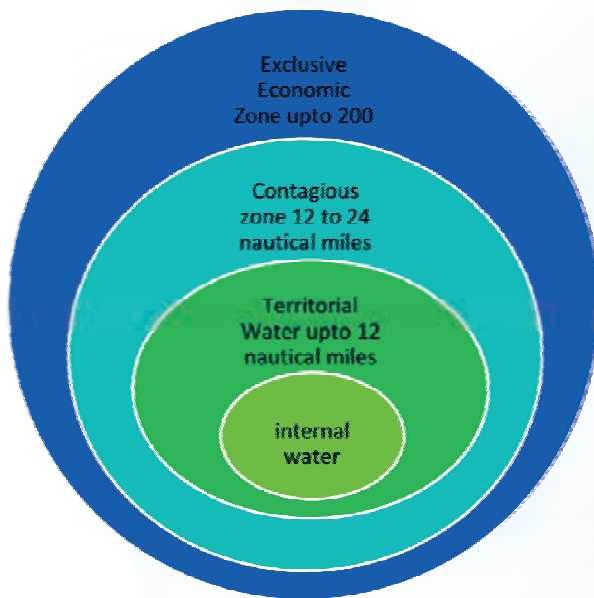
Fig. showing maritime zones of India

2) Arms Preparedness

India is one of the tri capacity countries that have all the three armed capacity but in real terms the capacity of India is very sheer when compared to China. The PLA Navy is the second most powerful Navy in the world after the US Navy. But again India for its strategic location in the Indian Ocean and proximity to the Malacca strait which appear to be the choke point between the Indian Ocean and west Pacific, can monitor the movement of traffic particularly of any submarines or warships. To mention the armed preparedness, the Department of Defense Production of the Ministry of Defense is responsible for the indigenous production of equipment used by the Indian Navy. India at present have 4 Aircraft carrier, 9 Amphibious vessels, 7 Torpedo's, 1 ballistic missile submarine, 19 attack submarine 11 cruiser and destroyer, 154 frigates and patrol vessels, ASW rocket launchers as 2, 8 Anti air missiles, 157 helicopters and 11 unmanned aerial vehicles, to name a few.

The issue that we face is that an estimated 22 different ministries and departments are involved in securing India's coasts. At the central level alone there are the Ministry of Home Affairs, Ministry of Defense, Ministry of External Affairs, Ministry of Shipping, ministry of Forest Environment and Climate Change, Ministry of Earth sciences, Ministry of Finances as well as Department of Fisheries. In addition to these are the state government, the district administration, police etc. The involvement of

such an array of agencies invariably leads to coordination problems.



The point of the above case is to draw attention to the flaws our security system is having and the prime of all is lack of coordination within the department. To avoid such tragic events in future what is needed is well coordinated system within the department, better surveillance system as if they could have caught in radar right before infringing the limits of Indian territory the event could have been avoided and lastly instead of considering fishermen as a liability they could be considered as an added security for India as fisherman are well qualified with the local language to get the information and act a source of information as have been mentioned above that have been neglected, they know the maritime in depth and length which an ordinary man lack, with continuous interaction with seas and oceans for ages they have developed with sense of weather pattern and all these could be incorporated in security enhancement, so what is needed is a transition from considering them a responsibility to having them as an advantage.

India conducts a number of naval exercises not only with neighboring countries but countries of strategic importance also, to name a few SIMBEX, SLINEX, INDRA, and MALABAR etc. The recent invitation to Australia for the Malabar exercise have many implications such as showing strategic signaling, a signal to a third country of the influence in the region and

a demonstration of resolve to diplomatic objectives, that try to act as infringement to sovereignty of India. Naval exercise signifies:

- Promoting brotherhood and camaraderie between soldiers
- Projection of nation's soft power

Case Study

The untragic 26/11 attack where by 10 men in infalable speedboats came ashore at two locations in Colaba. They reportedly told local Marathi speaking fishermen who asked them who they were to "mind their own business" before they split up and headed two different ways. The fishermen's subsequent report to the police dept recieved little response and local police were helpless.¹⁷

- Helps establishing unique spirit of bonding and friendship
- Indication of highest level of trust and confidence
- Understanding new technologies that other countries utilize and enable on the job training of each other's crew.

3) Legal Framework

When an issue arises within the internal water and territorial water the respective states have the privilege to deal with it. Suppose an act have been committed within the territorial limit but have fled to contagious zone than also the respective can be brought and tried within the country as per country law however if the crime have been committed in contiguous zone or the EEZ than have to appeal to International Tribunal of Law of Sea in Germany and then Permanent Court of Arbitration in Hague whose judgement is final in nature although not binding. However India being a signatory of UNCLOS, is bound to accept ruling which is in line with Article 51 of Indian Constitution which states that the states shall promote International peace and security by the prescription of open, just and honorable relations between nations, by the firm establishment of the understandings of international law.

¹⁷ <https://economictimes.indiatimes.com/news/defence/fully-equipped-to-thwart-26/11-like-attack-mumbai-top-cop/articleshow/72224084.cms>

Increase of High risk area zone from 65 degree E longitude to 78 degree East longitude because of reporting of pirates attacks in the Lakshadweep extending from the region of Horn of Somalia and Gulf of Aden have ended up serious implication in Maritime security of India and the above case an event took place under the issue. The mistake to highlight is the Law of 2002 under which the Italians were brought, that is the Anti-piracy Act, instead they should have tried as a regular trial could have been more fruitful. Although the Permanent Court of Arbitration has delivered the judgement as India having no jurisdiction but at the same time fisherman who died to be provided with compensation from the Italian government as infringement of India's maritime security.

On one hand the judgment has paved the way for more kinds of such events to occur and the foreign country officials could easily escape doing such kind of activity in future with no guarantee of being punished in their respective country. On the other hand in line with UNCLOS and Article 51, Govt of India asked the Supreme Court to close the case and hence India emerged as a responsible nation to respect the International laws.

4) Issues and Challenges

The Indo Pacific is a natural region. It is also home to a vast array of global opportunities and challenges. I am increasingly convinced with each passing day that the destinies of those of us who live in the region are linked.

-PM. Modi {Shangri La dialogue 2018}

As evident from the above line of honorable PM it's very

Case Study

Erica Lexi Case

Two Italian marine open fired resulting in death of 2 fisherman passing through India's contingent zone where as, as per India incident took place in India's territorial water and hence Indian Navy intercepted and brought them to Indian land. Italian officer are immune as state officers from criminal charges representing Italy govt.¹⁸

clear that whatever issues and challenges India is facing it cannot tackle them all alone neither it could be aloof from the challenges that other countries are facing to whom we are connecting so a collective response is needed to all these challenges.

i) Drug Trafficking

Recent uptick in heroin seizure in the Indian Ocean suggest the change in the strategy of drug trafficking activities as a result of the COVID 19 measures. The above mentioned case study coupling with the news suggests an indicator of increase in the use of the maritime routes for the trafficking of heroin to Europe along the southern route. India having a maritime boundary of 7516 km apart from guarding the maritime zone till the Exclusive Economic Zone apart from guarding it from the foreign countries has to be more alert regarding use of its territory for this drug trafficking purpose. While border measures appear to be hindering because of the tight safety provision that even got stringent because of the COVID issue and the escalation-de escalation process involvement with China being tough on traffic in opiates, large shipments of cocaine are still being trafficked but by alternative means that is via sea routes. India could adopt a better surveillance system along with proper patrolling in order to avoid such crime to take place under its nose. India could use IOFMC as a platform to address this issue and plan with other countries to tackle it in better way.

ii) Cyber security threat

The vessels have been attacked since immemorial times although the traditional method of attacking a vessel at sea and then holding it to ransom and as have mentioned above in the 2nd case study that for patrolling measure different countries have been collaborated especially the region near horn of Africa which later extended resulting in proximity to territorial maritime boundary of India. However, it is entirely possible that organized criminal

Case Study

World Drug Report of the United Nations Office on Drugs and Crime have reported that the 4th highest seizure of opium in 2018 was reported from India after Iran, Afganistan and Pakistan¹⁹

¹⁸ <https://frontline.thehindu.com/the-nation/article31987157.ece>

¹⁹ <https://www.thehindu.com/news/national/fourth-highest-opium-seizure-in-2018-reported-from-india-world-drug-report/article32005672.ece>

gangs can and will team up with hackers in order to locate high value cargoes at container terminals. Maritime domain is a rise in spear phishing of vessels at sea. Operating without effective cyber security measures in place exposing critical vessel control systems to significant vulnerabilities. A recent investigation by Pen Test Partners noted that, *“unknown systems can be prevalent on board ships. In every single test to date we have unearthed a system or device that of the few crew that were aware no one could tell us what it was for. The solution for the above situation is a robust cyber security system, developing IT Infrastructure, Offensive security and malware research.”*²¹

5) Initiatives

In security terms, piracy unregulated migration and the continued presence of extremist groups in Somalia, Bangladesh and parts of Indonesia pose a significant threat to Indian Ocean countries. Countries in the region need to collaborate to build economic strength and address geopolitical risks and there is a logical leadership role for India, being the largest player in the

Case Study

A recent cyber attack failed to penetrate Ports and Maritime Organisation system [PMO's] system. It was only able to infiltrate and damage a number of port operating systems at Shahid Rajaei Port near Strait of Hormuz. The attack was carried out by a foreign entity²⁰

region.

i). Indian Ocean Forum on Maritime Crime [IOFMC]

The Global Maritime Crime Program initiated the establishment of the IOFMC bringing together the countries of the Indian Ocean to fight transnational maritime crime and to share information, create prosecution networks and cooperate together against a range of crimes now using the ocean as a means.

ii). BIMSTEC

With a combined GDP of \$ 3.71 trillion, whether maritime or landlocked BIMSTEC countries depend on maritime trade for their economic development. BIMSTEC is a link between south Asia and South East Asia with 5 member countries namely Bangladesh, Bhutan, India, Nepal, Sri Lanka, Myanmar and Thailand. Cooperation in the security domain has been considered of special salience under BIMSTEC.

iii). IORA

The six priority areas of IORA include Maritime security, Trade and investment facilitation, Fisheries management, Disaster risk reduction, Academic and scientific cooperation and Tourism promotion and cultural exchanges. India could utilize this kind of platform to show its strength and raise its concern against any threat to its naval security.

iv). SAGARMALA

It would not be sufficient if only international concern was acknowledged leaving the internal issues and one step towards this process was the sagarmala initiative. The initiative to enhance the performance of the country's logistic sector. The upgradation of the 13 major ports and certain strategic minor ports is of great importance, to reduce logistic cost for EXIM and domestic trade with minimal infrastructure investment.

v). SAGAR (Security and Growth for All in the Region)

In the Indo Pacific, the most pressing challenge to existing maritime rules and norms is being posed by China. For example, China's willful disobedience of 2016 international arbitral tribunal judgement regarding the South China Sea is a direct assault on the UNCLOS, the so-called constitution of ocean, SAGAR could be India's answer. India believes in an Indo pacific that is free, open and inclusive. The Indo Pacific region is of great importance for India in connectivity, enhancing maritime security, counter terrorism, nonproliferation and cyber issues.

Conclusion

We can analyze that the Indian Ocean is an ocean of opportunities for India but comes with great

²⁰ https://www.defenseworld.net/news/26959/Iranian_Port_near_Strait_of_Hormuz_hit_by_failed_Cyber_attack#.XyVYFygzbIU

²¹ <https://dryadglobal.com/maritime-meets-cyber-security/>

responsibilities. The responsibilities toward the citizens of the country and to the neighboring nations. India being one of the major economies in the world with developing traits and demographic dividend can utilize its manpower resources for the purpose. The thought of considering fisherman and people living near the coast as a liability can be utilized as a person of responsibility as these are those who very well verse with the sea and ocean because of their association since ages and can be utilized as a source information of any insurgency, weather pattern near the sea especially tides and surges, the concept is basically converting liability to opportunity. India is a country having maximum number of hackers working around but the unfortunate is that they are being working for those companies of other country because there is no system in our country to recruit them for ethical purpose. As crime knows no boundary thus the cyberattacks, India could utilize the ethical hacking means to boost the cyber security. No doubt we have institutions like CERT-In in our aid but some countries with robust security are even hacked and India needs to prepare itself before any such tragic event. As we have started with that how Trade leads to economic growth and hence comes with greater security challenges but again if these challenges handle with caution and care can result in wonderful opportunities, the initiatives and forum like BIMSTEC, IORA on one hand can help as a platform for India to remind rest of the world about its maritime boundaries and boosting its sovereignty, initiative like sagarmala could help in boosting trade relations with other countries by providing better facilities. The Indian Ocean have provided us with an added advantage that we could utilize for trade, connecting better with other nation, providing jobs as correctly said “an ocean of opportunity” and it's with the country that if it could reap it or sink it in the ocean.

CRUISE DEVELOPMENT IN ANDAMAN: A NIMBLE VESSEL FOR SAGAR

Armaan Jena, A J

MA Defence and Security Laws, NALSAR;

Manager, Cruise Vertical, Mumbai Port Trust

The Union Territory of Andaman and Nicobar Islands (ANI) form an archipelagic chain of 572 islands and islets that straddle across Bay of Bengal and Andaman Sea.

These islands are just 0.2% of India's landmass but account for circa 26% of India's coastline and 30% of India's Exclusive Economic Zone (EEZ) post UNCLOS III of 1982 which resulted in an additional 0.66 million sq km of EEZ in Andaman & Nicobar Islands. Just the EEZ enabled from ANI more than the EEZ of Pakistan. EEZ is important as it is an international ratification of sovereign right that yields it the exclusive purview of a nation to explore, manipulate, manage and conserve the resources within its jurisdiction. Yet, for most of Independent India, the Executive followed the policy of 'Masterly Inactivity' and 'Benign Neglect' (Sanat Kaul, 2015). The Ministry of Defence were the first to realise the need for a paradigm shift with the formation of India's first joint Tri-Command in 2001 in Andaman & Nicobar (ANC) to leverage these islands to safeguard sovereignty and national resources as well as to fulfill its role as a net security provider in the region, India formed. However, this military arrangement is a crucial ; albeit preliminary policy step towards what Shri Sanat Kaul terms as 'Proactive Development' that includes the overall development and interlinking of ANI.

The ethos of this new paradigm is best enunciated by the Hon PM in a National Address inaugurating the launch of the Submarine OFC (Optical Fibre Network) where he laid emphasis on connectivity - both of telecommunication as well as physical infrastructure. Among an array of projects, the Hon PM at different junctures linked the need of connectivity to both domestic and international tourism as well as national security, particularly of frontier regions of land and sea. The NITI Aayog released a comprehensive paper last year, namely 'Transforming the Islands through Creativity and Innovation' that charts out a roadmap for the development of the islands. It specifies an impressive list of initiatives for both connectivity and tourism but only alludes to cruise tourism.

Yet, it is not surprising as cruise tourism is a niche and is in fact categorised as 'Niche Tourism' within the Ministry of Tourism. However, it is pertinent to note that cruise tourism in India, though in a nascent stage, has unbridled potential and has been one of the brightest stars in India's tourism portfolio. India aims to become a hub of cruise development and this is testament to the

fact that Cruise Shipping is one of the 14 Thrust Areas of Maritime Vision 2030 of the Ministry of Shipping. The focus of the Executive has been on building Cruise Terminals which has so far seen great uptake on the western coast Major Ports with Mumbai and Goa experiencing the most throughput of vessels so far. Along with the Ministry of Shipping, the Ministry of Tourism plays an important role as it disburses most of the funds for cruise infrastructure. It has activated the regional entities of India Tourism for cruise development.

The various connectivity projects and tourism initiatives have already laid a red carpet for the cruise ecosystem to connect with. Thus, cruise tourism in Andaman has many pieces of the jigsaw puzzle in place but not all. Unlike every cruise terminal planned so far by the Union Government, ANI does not have a Major Port Trust to anchor and guide cruise development in the region. Thus, it is the onus of the Indian state machinery to activate additional administrative entities for this blue ocean blueprint. Given the strategic location and the geopolitical context of ANI, the article makes a case for leveraging cruise tourism in Andaman as a vessel for 'nimble' diplomacy.

The COVID-19 epoch has disrupted the world order which is having an unprecedented impact on trade and mobility. It has exposed nations' dependencies and has pushed states to diversify sources by exploring and establishing new economic conduits. Similarly, tourism too needs to reorient itself to this new normal to revive and rejuvenate its ecosystem. Ports, both air and sea thus become gateways as well as checkpoints to control and vet passengers as they fulfill the role they play in travel and tourism. These controlled gateways, thus, become an inextricable component for tourism which seeks resumption in operations. 'Air Bubbles' have been mainstreamed with guidelines set by the Ministry of Civil Aviation. Similarly, 'Sea Bubbles' must gain global currency with the reboot of cruise tourism, along with other swift and commendable policy moves made by the Ministry of Shipping, India such as ratifying resumption of cruise traffic along with a steep discount to aid Cruise Liners as they resume operations in these challenging times. Never has the role of the Ministry of External Affairs been so pronounced with respect to international tourism as the act of omission and commission in selecting partner nations has a distinct geo-political

flavour besides being an indicator of a nation's capacity. Cruise tourism in Andaman enables capability-building by reducing omissions with partner nations like ASEAN and the larger Eastern Indo-Pacific in the short-run. In that light, rapid development of jetties in one to three locations for ANI cruise tourism is indeed a projection of India's prowess to build infrastructure but also intent to build ties. The proximity of ANI to ASEAN besides India's vast East Coast is an enticing proposition for any Cruise Liner which have redesigned their interiors to accommodate for physical distancing norms. All vessels will rejig their itinerary with a focus on 'Safe Havens' i.e destinations that are safe with a preference for exotic remote locales with less human interface during onshore excursions bearing in mind the need to ensure distance. Thus, development of ANI cruise ecosystem is an ideal choice; and also a nimble one.

The Eastern Outposts of Andaman and Nicobar Islands are instrumental to India's re-invigorated 'Act East Policy'. Beyond territorial waters, India has five maritime neighbours, namely Bangladesh, Myanmar, Thailand, Malaysia, and Indonesia in the east. Out of these, ANI is particularly close to Coco Islands of Myanmar that lie north of the northern tip of the Andaman Island chain and Indonesia in the south, with the Great Channel separating Great Nicobar Island of India and Aceh, Sumatra. The predecessor 'Look East Policy' articulated India's intention to foster, cultivate and deepen ties with maritime neighbours of South-East Asia through ASEAN and marked a re-orientation of India's foreign policy. The salient difference in the transition from Look to Act East is the great emphasis given to bilateral and plurilateral connectivity programmes and projects. With respect to ANI, the earlier Look East Policy ignored the importance and role of the islands in foreign policy. The Great Channel situated at the western edge of the Malacca Strait is at the confluence of three major sea routes of the Indian Ocean emanating to or from the Cape of Good Hope, the Gulf of Aden and the Straits of Hormuz making it one of the busiest sea routes in the world with the funnel-shaped chokepoint of Malacca Straits opening out to the Andaman Sea to its north. Thus, the Andaman and Nicobar Islands are strategically situated to India's advantage. The current Act East Policy seeks to rectify this omission through the medium of diplomacy and

development with the intention to convert this advantage into India's advantage.

The reawakening of India's maritime consciousness must be harnessed in our multilateral relations with ASEAN. Cruise tourism is an apt arrow in MEA's quiver to enable this. India has found it hard to economically integrate with ASEAN, but maritime connectivity through tourism with ANI is central to remedy this. It must be noted that "82 per cent of ANI is under declared forest land while about 90 per cent of land is under green cover based on satellite pictures. Within the declared forests there are three categories as follows:

1. National Parks
2. Sanctuaries
3. Reserve Forests

Cumulatively this amounts to 7,000 sq km of land surface out of 8,249 sq km." (Sanat Kaul, Pg 162, 2015). There are today 91 wildlife sanctuaries in Andaman Islands covering 456 square km of which 83 of them cover entire islands. Thus sustainability is central to any plans of development in ANI without which there would be grave environmental degradation. As such a large percentage falls under declared forest land, there is limited scope of industrial and agricultural activity. Tourism too can not be unfettered with a need to develop the ANI as an upscale island destination with limited access for eco-tourism purposes. The very nature of maritime tourism fits into this market positioning. The development of cruise terminals, marinas for cruising, yachting and ocean sailing can certainly position these pristine islands as one of the most exquisite, premium destinations for cruise in the world. Cruise tourism thus is a glue that can bind ANI-ASEAN economic integration.

In fact, the development of the cruise ecosystem can contribute even further if we layer a lens of bi-lateral trade into the mix. The infrastructure requirements of the cruise ecosystem in Andaman must be explored through imports from Indonesia. Ricardian Comparative Advantage of Trade with respect to construction materials from Indonesia not only lowers the overall cost of India's cruise infrastructure requirements but also injects vitality in bilateral relations by increasing volumes of trade through a new shipping link.

Diving even deeper, such bi-lateral momentum creates a conducive space for 'Soft Maritime Diplomacy' (Le Miere, 2014) between India and Indonesia. This is achieved by inducing the benign role of Navies and Coast Guards of both the nations for joint patrolling and surveillance in the Andaman Sea-Malacca Straits continuum for the legitimate means of securing trade and tourism.

In such a way ANI cruise development can be embedded in complete alignment with Honourable PM's SAGAR (Security and Growth for All in the Region) doctrine. In his Shanghai-La Address of 2018 he stated that this is the creed India will pursue even more vigorously through Act East Policy by seeking to join India to the east. At many junctures during his address, Hon PM of India emphasised the need for all and the role India will play as a partner in a multi-lateral compact in ensuring a stable rules-based international order. Cruise Tourism proffers India an additional prong to articulate and proliferate this strategic intent and objectives with the world at large. Tourism facilitates positive socio-cultural exchanges between nationalities besides boosting the economy. It manifests national intent with counterparts small and large wherein the exchange is based on collaboration and cooperation and not exploitation; and the objective is shared prosperity and not debt-ridden path dependence. To conclude, an attempt at a blue ocean blueprint is made to endorse and subsequently to channelise cruise as a nimble vessel for SAGAR and is in complete consonance with the values it enshrines, namely Sammaan (Respect), Samvaad (Dialogue), Sahyog (Cooperation), Shaanti (Peace) and Samruddhi (Prosperity).

PRIVATIZATION IN DEFENCE SECTOR

SAKSHI SHARMA

According to Investopedia, privatization occurs when a government-owned business, operation, or property becomes owned by a private, non-government party. Note that privatization also describes the transition of a company from being publicly traded to becoming privately held.

Defence is one of the core areas where a country's strength lies. The topic whether the defence sector should be given to private manufacturing units or kept

with the government sector is always debatable. Defence is one of those areas whose data is needed to be kept private. There is always the issue of breach of trust and as a result the onus to manufacture the defence equipments always lies on the government. But a couple of months ago, the government of our country announced the major opening of the defence production for private participation as a part of Atmanirbhar Bharat. The goods which our country imports from other countries will now be produced in the home country under the atma nirbhar bharat abhiyaan. The announcement by Finance Minister Nirmala Sitharaman on 16 May that the Ordnance Factory Board (OFB) would be corporatized could be a welcome change. However, since she also mentioned that it did not mean privatization and the corporatized OFB will remain under government control, indirectly implying Ministry of Defence (MoD), leads to inferences that nothing is likely to change.

Ordnance Factories are the oldest and largest organization in India's defence industry with a history that dates back to 1787. There are 41 Factories divided under five clusters or operating groups which are supposed to produce a range of arms, ammunition, weapons, armoured and infantry combat vehicles, and clothing items including parachutes for the defence services. They function under the Ordnance Factory Board (Board) which is under the administrative control of the Department of Defence Production of the MoD.

Defence Minister Rajnath Singh took the Atma Nirbhar Bharat scheme to the defence sector with his announcement that India would stop imports of hundred and one weapons and platforms. The moratorium on the selected defence imports begins in December this year and will continue for five years. The objective is to bolster the domestic defence sector, which showed some progress in the last financial year despite an indifferent outcome of big Make in India projects. Under the atma nirbhar defence campaign, the government will focus on manufacturing of sniper rifles, towed artillery guns, surface to air missiles, ship-borne cruise missiles, howitzers, bullet-proof jackets, radar warning receivers, transport aircraft, light combat aircraft and helicopters, and submarines among others. Some of the items listed to be embargoed are already being manufactured in India.

Howitzers and submarines are made in India. INS Shalki, a diesel-electric submarine was launched by

Rajiv Gandhi in 1987 and commissioned in the Navy in 1992. Additionally, India has indigenously built nuclear-powered submarines such as the INS Arihant. The submarine was made in collaboration with Russia. Still, the atma nirbhar move in the defence sector is estimated to save foreign currency reserves worth about Rs 4 lakh crore. So far so good. But the defence sector India needs to improve vastly on two counts urgently -- timely completion of projects and satisfactory quality.

According to a Stockholm International Peace Research Institute report, released days before the government imposed a lockdown due to the coronavirus pandemic in March, India for the first time emerged as a global exporter of arms. Several Make in India projects have been stuck for more than five-six years. Some of these include an India-Russia joint venture for making 200 units of light utility Kamov-226T helicopters for the Army and Air Force, 111 units of naval utility helicopters, diesel-electric stealth submarines and also manufacturing 114 fighter jets for which approval was given in 2018. Besides delay, quality of the products has been under question. In 2019 itself, the Army red-flagged quality issues with the ammunition supplied by Ordnance Factory Board. The ammunition was stated to be damaging tanks, field guns and causing fatalities. The soldiers, at one point, were asked to buy their own boots and uniforms due to substandard quality of products supplied by the defence ministry.

The quality of manufacturing at Hindustan Aeronautics has been a subject of intense debate during Rafale deal controversy. Dassault -- the French company that makes the Rafale -- had reportedly expressed its lack of confidence in the manufacturing quality of the HAL when the defence deal was being negotiated during the UPA rule.

"We have made concessions for HAL, but will the enemy make any concession for us when we face them in battle?" then Air Force chief BS Dhanoa at an event in Delhi was quoted as asking in 2019. His comments had come days after an HAL-made Jaguar crashed in Uttar Pradesh. Ironically, a day after he made the remark, another HAL-made fighter jet -- a Mirage-2000 -- crashed in Karnataka killing two squadron leaders.

As explained by Professor Arvind Kumar in a webinar organized by the NALSAR University, the role of the private sector is not given that much importance due to the lack of trust for the private sector.

NEED BASED ROLE OF PRIVATE SECTOR

The production of defence equipment should be done in such a robust manner that we see the shifting of India from net importer of the defence equipment to the net exporter of the defence equipment.

REASONS FOR THE LESS ROLE OF PRIVATE SECTOR SO FAR

- India's IT industry is not given much importance by the government.
- Government never planned an IT revolution.
- There is always a lack of trust in the defence sector for the private manufacturing units.
- Lack of encouragement for the involvement of private sector

The Galwan incident has opened the eyes of India. Now India has realized that the private sector's involvement should be there in order to cope with the lack of defence equipment. Though the public enterprises are trying to suffice the requirement of the defence equipment but it alone will not be able to cope with that. There should be public-private partnership.

FREEDOM TO ATTACK AND FREEDOM FROM ATTACK

In order to get freedom from attack, the freedom to attack must be there. And in order to attain freedom to attack, there must be an abundance of defence equipment. India is weak in its manufacturing capabilities. But defence can never be fully privatized.

Private sector as well as the public sector must work together in order to achieve the goal of net exporter of the defence sector.

BENEFITS OF PRIVATIZATION

- There would be an abundance of defence equipment.
- There would be exports of the defence equipment.
- India will become self-reliant.
- India will no longer fear the attack of the other countries.

RISKS INVOLVED

- The private units can not be relied upon.
- Due to the evil of corruption, there are chances of getting the private units involved in the malpractice.
- The involvement of the private sector in the defence

sector can become a major issue due to the involvement of confidential information.

- There are chances of the involvement of the private manufacturing units in moulding the equipment as per their levels.

CONCLUSION

To conclude, it can be said that the defence sector can never be fully privatized but public-private partnership can do wonders in the said sector.

ROLE OF INDIAN AIR FORCE DURING THE COVID-19 SCENARIO

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Introduction

During my childhood days, having seen on many occasions the birds fly with their wings with ease and freedom, it was my dream to take a similar exercise and conquer the sky. The dream is still alive to take up the carrier more so with the Indian Air Force rather than with the civil or commercial aviation. The Indian Air force drew my attention and made me attracted towards it for the dream was to be a pilot of a jet fighter aircraft piercing through the clouds in the sky with absolute freedom and great speed conquering high altitudes.

It can be said that one of the unaffected areas during the period of covid-19 was the continuing non-stop saga of the services of the Indian Air Force, which provided protection to the aerospace of our motherland from the attacks of any enemy so also has rendered services in several forms assisting the people and the Government of our motherland from the disaster of the covid-19. There are several instances of the Indian Air Force coordinating with the Indian Army and Indian Naval services in rescuing and meeting the needs of our Nation internally during the period of covid-19. The Indian Air Force is rendering a commendable job protecting our motherland internally and externally as and when situations arose. The contingent of Indian Air Force does not merely mean and include Fighter aircrafts like Jaguar, Harpy, Su-30MKI, Mirage 2000, MiG 29, Tejas, MiG-12 etc. Helicopters like Apache, CH-47, Chetak, Cheetah, Chinook, Rudra, Mi-8, MI-17; Mi-26, Dhruv etc. Reconnaissance planes like Searcher-II, Heron etc. Trainer flights like Hawk MK, Kiran, Platous C-7 Mk-II etc. Transport planes like C-130J, C-17, Globemaster III, CH-47F(i), An-32 etc. but also selfless, dedicated and

passionate officials who round the clock have been on duty to achieve the goal of providing security and safety to our motherland.

Strengths of the attacking IAF

The Indian Air Force has indulged in four wars with Pakistan and one with the China since 1950 and came out with laurels and flying colours bringing glory to our motherland. The IAF was also involved in several military operations in the course of protecting our motherland. The Indian Air Force has been increasing its strength from time to time on the attacking side duly taking into its stride the advances technologies to be in race with the other nations. The Indian Air Force has strengthened its air squadrons from time to time. The “Westland Wapiti” is one of the first known aircraft flown by the Indian Air Force, then on to “Vultee B-24 Liberator”- a bomber used in the early 1950's, then on to “Canberra”-medium bomber, then on to “Mystere IVA” during the 1960's. The IAF in majority has in its belt fighter aircrafts with their respective origins at France and Russia. The Mikoyan Gurevich Design Bureau made MiG-21 inducted in or about 1961, MiG-21(Bison), MiG-23, MiG-27 also of Mikoyan Gurevich Design Bureau, Russia and manufactured under HAL under a license agreement with Russia (renamed as “Bahadur” by IAF) though grounded in 2017, the updated MiG-27 which however still operates in India, MiG-29 of the year 1985 with its latest version which is in operation in India, Sukhoi-30MK1 also known as Flanker (NATO) built in India now by HAL under a license agreement with Russia inducted in the year 2000 are all of Russian origin. Similarly, the newly inducted fighter Dassault “Rafale” just a few months back in 2020 and the fighter Mirage 2000 (renamed as Vajra) commissioned in 1985 is also from Dassault, having its origin in France. The recently added “Rafale” fighter to the Air force squadron has taken the IAF to great heights and made our motherland proud and a force to reckon with across the globe. The “Tejas” is the first indigenously Indian built fighter with the borrowed jets from Russia, France and Great Britain and joined the IAF with the formation of a squadron in 2016 called “Flying Daggers”.²² The SEPECAT Jaguar is a fighter of a joint venture of Great Britain and France and the Indian

Air Force is currently using the upgraded version of the same. The Indian Jaguar and the Sepecat Jaguar are different from each other. The newly inducted “Rafale” fighter aircraft is now doing its flying exercises in Himachal Pradesh. The Indian Air Force is the 4th Biggest Air Force in the world.²³

The technological developments have no ends and bounds. The various advances made to the fighter aircrafts have made it more powerful and aggressive. The days are not far when we can see and hear unmanned fighter aircrafts without a pilot fighting out the wars/battles with great success completing the given task and target with the human created Artificial Intelligence doing the necessary work of passing instructions through a device from the ground. We can anticipate a fighter aircraft running through alternative sources of energy that is in use now in the form of special aero fuel.

IAF and Covid-19

The IAF has prepared well in keeping with the period of covid-19 period as matters relating to fitness levels, of the crew, operational procedures etc²⁴. The IAF was highlighted with a low profile by the social media during the covid-19 period, but the services of the IAF during this disaster period has proved vital as China created a situation for battle/war near Ladakh border with Nation. The military troops and the Air Squadrons of the IAF were to be alerted and fighter aircrafts were to be made to run in and around as a secured measure showing the diligent approach and preparedness. The IAF showed its assistance not merely as an attacker while dealing with enemy nations but also by way of internal crusaders has rendered services within our Nation too. During the covid-19 period, IAF came forward supporting the domestic civil aviation industry providing necessary means for transportation of goods and services. The IAF did play its role in rescue operations during the disasters that occurred because of heavy rains and landslides during covid-19 period.

The IAF designed Airborne Rescue POD for isolated transportation to evacuate patients from remote areas during the covid-19 period. The IAF has played its role in

²² A Look at the Mighty Fighter Jet Fleet of the Indian Air Force: Rafale, Tejas, Sukhoi and More www.news18.com last seen on 14-8-2020

²³ List of All Fighter Aircraft of Indian Air Force-#IndianAirForce#IndianAirForceJets-video Youtube-GlobalConflict dated.25-8-2019 last seen on 14-8-2020

rescue operations in evacuating patients suffering from infectious diseases like covid-19 from high altitude and isolated areas. Similarly, IAF did its services at Lengpui Airport in Mizoram and in the month of April this year with supply of 22t medical supplies through its transport aircraft for the governments of Mizoram and Meghalaya. The IAF has designed an Airborne Rescue POD for isolated transportation to evacuate patients from remote areas during covid-19 period.²⁵ The IAF through its aircraft IL-76 has delivered essential medical supplies and commodities in the North eastern region as its role and duty to support and fight against covid-19. In April of this year, the IAF's C-130 J aircraft airlifted the team of Armed Forces Medical services(AFMS) from Kuwait along with a six year old girl (along with her father) suffering from cancer requiring immediate emergency surgery.²⁶ The evacuation of Indians from the epicenter of covid-19, the city Wuhan was an achievement. It is stated that from the evacuation of Indians struck in the Wuhan to distributing essential medical supplies, within the country the IAF has displayed immense commitment.²⁷ The IAF has rendered its services by transporting 450 tonnes of medical equipment and materials to Male, Maldives as "Operation Sanjeevani".²⁸

The IAF with its wings enlarged to do service and always ready to meet critical moments as challenges has come out with success, appreciation and applause. The IAF has seen many victories. The IAF can prove as a valiant warrior in the ongoing war against covid-19. The glowing journey of IAF is still on....

ROLE OF PRIVATE PLAYERS IN THE SPACE PROGRAMME: AN INDIAN PERSPECTIVE*

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Introduction

Nowadays only the one thing which comes under the mind is the new changes which have been brought under the space sector. Among which is the IN-SPACe which

will be in operation in six months' tenure.²⁹ It would assess the requirements and necessity of private players. It would cover educational as well as research institutions as well as it would explore different ways to accommodate the necessity and needs in consultation with ISRO. The prevailing ISRO infrastructure consists of the ground as well as space-based. It focuses on scientific as well as technical resources and the data has to be planned to make accessible to interested parties to enable them to focus on the space concerning activities. However, it is not that there is no private sector involvement but there is huge participation in manufacturing as well as fabrication of "rockets" as well as "satellites" which now take place under the private sector. Nowadays there has been a surge in the role of research institutions in this sector. Indian industry at present has only three percent share in the space economy worldwide. One needs to remember that only two percent have focused on rockets as well as satellite launch services. This shows that it requires large infrastructure as well as heavy investment in order to grow this sector in India. However, ninety-five percent focuses on satellite as well as ground-based services.³⁰

Unfortunately, the Indian industry has been providing supplies of components as well as subsystems only. It doesn't have resources or technology to deal with independent space projects which the American companies are performing at present. For instance, SpaceX has been providing such services.³¹ It is to be noted that in India space-based applications, as well as services, are felt the need of the hour. Their demands have risen over time in India but sadly ISRO is unable to cater to such activities. On the other hand, there have been some companies which have focused on developing "launch vehicles". At present ISRO rockets provides all the launches and it has been willing to provide all the facilities to the private players which were approved by IN-SPACe. The ISRO would have provided facilities to the private companies for building their

²⁴ www.onmanorama.com dt.14-5-2020-Anantha Krishnan M-IAF puts in fine protocol for flying during covid-19 seen on 14-8-2020

²⁵ <https://www.airforce-technology.com> dated.9-6-2020 IAF develops rescue POD to evacuate patients during covid-19 seen on 13-8-2020

²⁶ <http://indianairforce.nic.in> dates.28-4-2020 -IAF's support towards fight against covid-19 seen on 14-8-2020

²⁷ <https://www.financialexpress.com> dt.14-6-2020-Fighting covid-19:IAF's response to the coronavirus threat seen on 14-8-2020

²⁸ <https://www.indiatoday.in> dt.21-4-2020-Coronavirus in India:Air Force backs nation's effort in fight against covid-19 seen on 14-8-2020

²⁹ Supra note 1.

launchpad. For instance, the Sriharikota launch would have been supported when help was required. Interestingly, IN-SPACe would act as a facilitator and regulator. It would act as interference between “ISRO” and “private parties”. This will be beneficial in finding out how Indian resources can be utilised properly as well as space activities.³²

Benefits for ISRO

This effort should be encouraged to achieve commercial goals.³³ There is a need to have better space technology and resources. Unfortunately, ISRO is unable to provide such services. This will motivate ISRO in achieving their specific goals such as research, science as well as development. Sadly, too many routine activities consume the resources which have resulted in a delay in achieving ISRO's strategic goals. Therefore, there is no need that ISRO should only focus on weather or communication satellites. Nowadays private players have indulged themselves in such activities. After getting inspiration from NASA now ISRO wants to focus on conducting space as well as scientific missions. For instance, it wants to observe the activities about the Sun and the Moon. Keeping the prime objectives in mind it is believed that one day it will do “human handling” on the moon. It would earn by providing services such as data to the private players.³⁴

The Future

IN-SPACe is the second space organisation created by the Indian government. The Indian government through the 2019 declaration on Indian Budget has provided set up for “New Space Indian Limited”.³⁵ It is a public sector company whose aim is to provide a marketing arm to ISRO. Its objective is to focus on technologies that are developed by ISRO. It would fulfill the needs of their client. This role has been performed earlier by Antrix Corporation which still functions. However, the Indian government has focused on the need to define New Space's role.³⁶

Conclusion

In order to make India a self-reliant country the focus of the Indian government is to encourage the participation of private players in the space sector.³⁷ ISRO would be able to achieve its ultimate goal by having a proper demarcation of its duties toward this sector in the future. With the help of technology development as well as acquisition, it is believed that India would be able to contribute its role in this sector properly. The quality of the research will be maintained and the private player's participation would encourage the establishment of better formation of space technology. The new reforms would allow the private players to use the ISRO facilities to achieve their goal is a big deal. In order to gain recognition in the global market India's participation in the space sector will be a great stand. At present India needs to have a cooperative environment to encourage such activities and the Indian government should promote and act effectively in reality.³⁸ The call for better reforms in this sector would result in better results in the coming future. The role of the private sector would result in achieving greater objectives and this will result in technological development as well as space exploration. This shows that the space sector will be protected as well as safeguarded properly with the involvement of the Indian government and private players in such activities in the near future. It is believed that the huge amount of the private players would result in better growth of this sector and the space activities which are in its proper form and there will be proper utilisation of resources and research related to space will be safeguarded.³⁹

SPACE LAW

Sarthak Dutt

Introduction:

There have been many satellites revolving around the earth surface performing various functions such as Broadcasting, Weather forecasting, Remote sensing etc. The major objective of writing this research paper is

³⁰ Supra note 1.

³¹ Ibid.

³² Supra note 1.

³³ Ibid.

³⁴ Supra note 1.

³⁵ Ibid.

³⁶ Supra note 1.

to address the reader about international laws governing outer space, the moon, celestial bodies and peace treaties that have been signed by various nations. Space law has been in the news due to its harmful effects created by humans by way of technological advancements and inventions in space. The first satellite in space was 'Sputnik' launched in the year 1957. Since it was the world's first artificial satellite that was launched by Russia. Since then many countries in lieu of competing with developed nations have been launching satellites in space for commercial purposes. Discussing this issue from an international perspective they came to a conclusion that 1) Space is free for all nations to explore and no particular nation can own a privilege over it. 2) Moreover no nuclear experiments or weapons of mass destruction are allowed outside Earth's orbit or outer space locations. (Peace is the sole motive of all nations who are part of the Outer space Treaty).

Committee on the Peaceful Uses of Outer Space (COPUOUS) is an International treaty that came into force in 1958. Till now 77 member countries have signed the pact. Major developed and developing countries like India with their Space agencies like NASA, ISRO, Roscosmos, JAXA, CNSA, and ESA are looking into the matter seriously so that activities in outer space must be monitored. The treaty has been described as 'focal point' which allows all member countries to discuss space regulation, Outer space peace, its functioning etc. The fundamental treaty governing the principles and activities of celestial bodies and the moon is termed as 'Outer space treaty'. The area beyond earth's crust where no nation has jurisdiction is termed as "Outer space". Some of the treaties on Outer Space are:

1. Rescue Agreement, (1963) the agreement focused on emergency landing of space shuttles to make safe landing on other countries' territory which is close to the surface of earth while the shuttle is in space in case of any default or for tank filling.
2. Liability Convention, (1972) the member countries to

this treaty are solely liable for acts amounting to cause damage due to the conduct of their SpaceShips.

3. Registration Convention, (1975) the main objective of this treaty was to keep a check as to the registration of space ships launched at a particular period by a particular State. Each launching State has to inform the UN Secretary General. This UN body will maintain records as to the number of space ships launched by a State.

4. Moon Agreement, (1979) was entered into by member countries with the objective of making the celestial Body Moon and other celestial bodies other natural resources the common heritage of mankind. This provision is applicable to other planets which are there in the solar system.

History:

In (1957), U.S.S.R launched its first satellite 'Sputnik I' for military purposes into space. Since then many space agencies across the globe began sending satellites into space. There was a need to make stringent laws on the topic of space which marked a significant hype in Human evolution ever.

As the space race grew in the 1950's the government began to talk about the need for responsible behaviour in space exploration. The United States and the USSR were part of the discussions. The US started the debate in late 1958. In 1959, the US formed the Committee on the Peaceful Users of Outer Space (COPUOS). COPUOS is the main international group for discussing space activity and its related agreements.

The COPOUS committee created five different treaties between 1967 and 1979. The first of which was on the principles governing the Activities of State UN the Exploration and Use of Outer Space, including the moon and other celestial bodies. The treaties cover the topics such as rescue of astronauts, liability issues when space activities cause damage and registration of bodies that public bodies and private entities launch into outer

³⁷ Rajeswari Pillai Rajagopalan, INDIA'S SPACE PROGRAMME: A ROLE FOR THE PRIVATE SECTOR, FINALLY?, [https://science.thewire.in/space/nirmala-sitharaman-indian-space-programme-isro-private-sector/#:~:text=India's%20finance%20minister%20Nirmala%20Sitharaman,ISRO\)%20with%20the%20private%20sector](https://science.thewire.in/space/nirmala-sitharaman-indian-space-programme-isro-private-sector/#:~:text=India's%20finance%20minister%20Nirmala%20Sitharaman,ISRO)%20with%20the%20private%20sector) (last visited on 12 August, 2020).

³⁸ Ibid.

³⁹ Supra note 11.

space. The agreement discusses appropriating resources. Generally the treaties have supported the notion that no state should claim sovereignty of any celestial body including the moon. One treaty banned the use of nuclear weapons in space.⁴⁰

The core substance of International Space Law is based on the five (5) United Nations (UN) treaties. The primary treaty governing the Law of Space is the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies or more commonly known as the "Outer Space Treaty" of 1967. The following treaties are equally important: the 1968 "Rescue Agreement", the 1972 "Liability Convention", the 1975 "Registration Convention" and the 1979 "Moon Agreement." These treaties form the core of the International Space Law that was formulated during the 1950s. Since then, a plethora of resolutions and guidelines has followed on a non binding basis, but not a cohesive Convention like, for instance, the UN Convention on the Law of the Sea that deals with all issues as a package deal providing a holistic approach on oceans, has been adopted for space thus far. Thus, the absence of an updated binding treaty along with the maturity and the progressive development of technology increase the need of Space Law to be further developed, as well as the need to interpret it in the light of the arisen issues.

Privatisation of ISRO into Space :-

Indian Space Research Organisation an Indian space agency has now privatised the Space sector making it feasible for young start-ups to set-up their business into space. ISRO will be providing the platform to private organisations making it take one step ahead in the space sector around the world. Space X is one such example which is a private entity in the space sector.

Space Cloud Data as a Service :-

Data is the most essential asset for Humans in the 21st century. It is the most important asset of human civilization. One such technological advancement in Data protection is to store virtual data in space. An artificial satellite will carry all such data and will revolve

around Earth's space belt. It will be considered as one of the safest modes of storage without any Jurisdiction hazards, free of insecurity, data vulnerability, cyber threats etc. The data which is basically land based data centres can leverage the isolation of space based cloud infrastructure. Even future start-up's will see a spontaneous boom into securing the privacy and data handling will be commercialised which will generate a huge revenue for the State economies based on this. So far the legal aspect of this is under Public International Law regime and there is no law as far as the U.N. Charter is concerned.

Removal of Space Debris :-

After Russia's "Sputnik I" became the first country to send a satellite in space on October 4 1957. It was then when the race between the nations in launching satellites began. It was the first military satellite which was launched in space. Since then many countries have been sending their aircrafts into space. The question arose as to what can remove the space debris which has been collected since many decades. The outside space is filled with so much metal waste such as components of aircraft, destroyed metal particles revolving around earth which can become a serious problem in the near future for astronomers and International space stations to launch satellites into space. According to the International treaty nations violating the rules will solely be held liable for damages caused to outer space or spoiling and creating space debris. Activities carried on by nation's are not allowed to contaminate space by creating hindrance for other space shuttles or satellites being launched in the near future. Agencies are looking into such issues and have begun removing the debris through loops and harpoons.

Military forces in Space:

Many spaceships are launched into space by countries and these artificial satellites are used for many purposes such as weather forecasting, Broadcasting, Remote sensing and one such is Defence. It is for the purpose of Military surveillance across its boundaries satellites are being launched. The U.N convention recognised it as separate from other purposes. Therefore it is the major

⁴⁰ <https://legalcareerpath.com/space-law/>

purpose for the international treaty Countries can use the space for the purpose of research and development is permissible but for the purpose of setting up of Military base, installations and fortification is not permitted. The aim of this treaty was to provide peace among member nations and non-State entities. Also each nation is expected to respect other satellites launched in space.

Conclusion

The conclusion drawn from this would be to give an overview of the topic of International law. Space law being a subject of Public International Law is very static and is subject to change if any new technology emerges. Thereby the idea of this article is to show emerging fields in the Outer Space and to give a different perception to make laws governing such activities in space sector.

THE CHANGING GEO-POLITICAL TERRAIN OF INDIA'S NEIGHBOURHOOD DURING THE COVID-19 PAN-ENDEMIC: THE CHINA FACTOR VIS-A-VIS INDIA.

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THE CHANGING NEIGHBOURHOOD OF INDIA.

During recent times many of the old issues and newer ones have emerged regarding the total and authoritative control of India on India's sovereign Property. With Pakistan and Nepal unilaterally coming up with newer maps clearly trying to usurp Indian Territory.⁴¹ The diplomatic efforts have not brought any resolution as there is a move by the political class to get closer to China. China claims to be an all weather ally of Pakistan. This has emboldened Pakistan even further and hence the constant attempt to create a skirmish.

COVID-19 AND THE EVER AGGRESSIVE CHINA.

China during the Covid-19 crisis started to take an aggressive stance. It has in the months of March and April this year, when the whole world has been dealing with the fallout of the COVID-19 pandemic, started stepping up and taking a lot of aggressive actions like the

renaming of as many as 80 unique and different geographical features that surely exist in the region surrounding it and recognising them as symbols of sovereignty of China.⁴² Complaints have been raised on numerous occasions as to the existence of China's very real expansionist attitude with regard to South China Sea and countries like Japan, Indonesia, Taiwan, Vietnam and South Korea all have been complaining about China's posturing and menace of its attitude towards their sovereign territory in the very vicinity of China.⁴³ China does it through unilateralism instead of using compromise as a method when it deals with its neighbours who are smaller than it. This is in furtherance of the Belt and road initiative as well as the Maritime Silk Road by China.

INDIA, NEPAL, SRI LANKA, BANGLADESH AND CHINA.

On the other hand China is also now interfering with India's relationship with its neighbouring countries like Nepal, with India's long standing ally now having turned away from India and looking more China centric. Relationship has certainly gone sour in past months whereby Nepal has taken a leaf out of the Chinese playbook and unilaterally claimed 'Kalapani area' as a part of Nepal and have published new maps which show the area to be within Nepal and then that map has been approved by the legislature as well.⁴⁴ In the case of Sri Lanka, the recent elections and the reelection of the Rajapaksas to power there has also been a dampener for India and does not look well for the future of India-Sri Lanka relations.⁴⁵ The worst is however, the recent existent strain in the India-Bangladesh relationship that augurs negatively for India even though there is a very good and warm pre-existing relationship of goodwill between the Prime Minister of Bangladesh Sheikh Hasina and her counterparts in the Indian leadership.⁴⁶ This forms the crux of the real concern faced by India as these are the countries that are going to be the basis of success of either India or China in this region of South Asia and can help curtail Chinese activities in the region. Recently, the Chinese Foreign Minister Wang Yi had

⁴¹ Nayanima Basu, 'Solution to Map-Making Pakistan and Nepal Is in India Pressing Reset Button on Regional Blocs' (ThePrint, 7 August 2020) <<https://theprint.in/opinion/solution-to-pakistan-nepal-maps-india-pressing-reset-button-on-regional-blocs/476907/>> accessed 15 August 2020.

⁴² M k Narayanan, 'Isolating China, as Proposition and the Reality' The Hindu (11 August 2020) <<https://www.thehindu.com/opinion/lead/isolating-china-as-proposition-and-the-reality/article32320417.ece>> accessed 15 August 2020.

organised a virtual meeting of the Foreign Ministers of Nepal, Afghanistan and Pakistan in order to propose the creation of an economic corridor with Nepal, which he called as “the Trans-Himalayan Multi-Dimensional Connectivity Network” In this meeting he also talked of the expansion of the China-Pakistan Economic Corridor (CPEC) to Afghanistan, by pointing out the benefits of this new economic corridor which is to be built in line and in conjunction with that of CPEC.⁴⁷

INDIA, IRAN AND CHINA.

Additionally China has also dealt a blow to India and Iran relationship. Iran and China have reportedly been pursuing a plan of economic and security partnership whereby there would be extensive Chinese investments in the area of energy as well as many other sectors of development in Iran, this would be in return of China getting a regular supply of oil from Iran over the next 25 years or so.⁴⁸ But the blow has come in the form of the Chabahar Port Project as China has ingeniously put itself in the position of circumventing the earlier monopoly held by India over the Chabahar Port, by undercutting India's offer and providing their own massively generous aid package to Iran for the Chabahar-Afghanistan Rail link, that has to be established.⁴⁹ The Geopolitical balance is shifting against India and therefore India needs to rethink its approach to its neighbours and allies to deal with ever expansionist China.

ALLIES NOT SPARED

In this scenario it must also be put forward that the Chinese expansionist traits do not only affect India but also China's own allies like a recent report from Nepal hints at the Chinese encroachment on their land as

well.⁵⁰ Recently Chinese media has also been clamouring for the Pamir mountain range in Tajikistan be surrendered to China as it was once part of China but this has brought Russia into the conflicting mix as Tajikistan is considered to be the part of the strategic backyard of Russia.⁵¹ The Chinese expansionist attitude has for many years been a thorn in the side of many nations however they have also faced stiff resistance from other countries regarding their territory. However the Covid-19 crisis has diverted attention of many countries who are trying to control the disease and death toll. This has cleared a path for China to take up the aggressive stance that it has taken.

INDIA AND CHINA

India has recently come in direct conflict with China in the Ladakh region where there was a bloody skirmish between the Indian and Chinese soldiers.⁵² China claims territories in Ladakh and claims Arunachal Pradesh as Lower Tibet.⁵³ The military and diplomatic talks to de-escalate the situation have until now been mostly unsuccessful.⁵⁴ Experts believe that in the Ladakh region both the countries have very limited manoeuvrability to take any advantageous position.⁵⁵ This is where the alliance with Nepal comes into the picture. The country with the better relations may use Nepalese territory to gain an advantageous position in the region of Ladakh. Therefore the friendly overtures by China to Nepal and the increasing interference and presence of the Chinese in Nepal and the deepening chasm between India and Nepal may be warning bells for the future and India to take strategic action.

THE DEFENCE AND SECURITY IN INDIA-FICTITIOUS OR FACTUAL

⁴³ Peter A Dutton and others, 'Cooperation from Strength: The United States, China and the South China Sea' (Center for a New American Security 2012) <<https://www.jstor.org/stable/resrep06426>> accessed 15 August 2020.

⁴⁴ 'India-Nepal Ties: Experts Urge Both Sides to Resolve Kalapani and Lipulekh Boundary Issues Amicably' (The Financial Express, 21 May 2020) <<https://www.financialexpress.com/defence/india-nepal-ties-experts-urge-both-sides-to-resolve-kalapani-and-lipulekh-boundary-issues-amicably/1966300/>> accessed 15 August 2020.

⁴⁵ Dipin Damodharan: Opinion: November 22 and 2019, 'Why the Return of Rajapaksas Is Bad Omen for India' (KochiPost, 22 November 2019) <<http://qjk.9bc.myftpupload.com/2019/11/22/why-the-return-of-rajapaksas-is-bad-omen-for-india/>> accessed 15 August 2020.

⁴⁶ Kallol Bhattacharjee, 'Sheikh Hasina Did Not Meet Indian Envoy despite Requests: Dhaka Daily' The Hindu (New Delhi, 25 July 2020) <<https://www.thehindu.com/news/national/sheikh-hasina-did-not-meet-indian-envoy-despite-requests-dhaka-daily/article32187068.ece>> accessed 15 August 2020.

⁴⁷ Ananth Krishnan, 'China Chairs Meet with Afghan, Pak., Nepal Foreign Ministers' The Hindu (27 July 2020) <<https://www.thehindu.com/news/international/china-chairs-meet-with-afghan-pak-nepal-foreign-ministers/article32206906.ece>> accessed 15 August 2020.

⁴⁸ Farnaz Fassihi and Steven Lee Myers, 'Defying U.S., China and Iran Near Trade and Military Partnership' The New York Times (11 July 2020) <<https://www.nytimes.com/2020/07/11/world/asia/china-iran-trade-military-deal.html>> accessed 15 August 2020.

⁴⁹ 'China Bags Iran's Friendship with a Loan — Costs India the Crucial Chabahar Port Project' (Business Insider) <<https://www.businessinsider.in/policy/foreign-policy/news/china-bags-irans-friendship-with-a-loan-costs-india-the-crucial-chabahar-port-project/articleshow/76963271.cms>> accessed 15 August 2020.

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Introduction

India is surrounded by the mighty Himalayas on the top and with water bodies on the three sides of the land. While the distinct features of the country bring a humongous amount of advantages, it also brings about certain demerits. In general, the term defence refers to the action of defending and protecting the country from any attack that could render it in incapacitated situation. In order to avoid the tensions and clashes with the other country, it is often seen that every country tends to create, establish and execute its own defence structure and mechanism. Furthermore, the security of the nation has to be the paramount for every State and it should be ensured at its optimum level in each and every realm. The term security means to be free from the state of danger or threat. The priority of India has always been to defend itself from external and internal aggression and ensure the security of the entire nation while maintaining the status of peace keeping country. The concepts of diplomacy, foreign state policy and inter-state relations become a cardinal aspect of the defence and security of the nation. In reference to this, India has witnessed landmark changes which can easily be divided into several phases. However, the situation has been extremely different from time and again since independence.

Historical perspective

The history of India's defence and security dates back to

5000 years when the maritime aspect existed. The Rig Veda mentioned around 1500 BC about Varuna being awarded with the credits of having excellent knowledge of routes of oceans throughout and there is an enormous explanation of naval expeditions. Also, there have been many mentions of the earliest organizations pertaining to the ships in ancient India in the Mauryan Empire itself from the 4th century BC. The Mauryan empire, Chola, Vijaynagara, Mughal and the Maratha empires are known to be the greatest militaries of their times. The structure of defence and security was as such that particular time that the sea lanes between the land of India and the neighboring lands were being used exceptionally, not only for the purposes of battles and wars but also for the trade and businesses for number of centuries, thereby, leading widespread influence and amalgamation of culture of India on the other societies. During the 17th and 18th centuries, the fleets of Kerala and Maratha expanded multifold, thus, becoming the most powerful forces of the entire subcontinent leading to defeat of many European navies from time to time. With the advent of British rule, massive changes were being brought about in the defence and security of British India. The Royal Indian Navy was first established during the time of British rule itself. The Indian military was also being used during the First World War and it fought against the German Empire in German East Africa. However, after the First World War, the "indianisation" of the military actually began. World War II brought about the largest volunteers in the army leading to huge success during wars along with the awards to their names. The constant demand for the wars as well as the near ending of the British era in India brought novel aspects and the increased rate of indianisation of the

⁵⁰ 'China Occupies Nepal Village, Lands after Face-off with India in Ladakh; Oli Govt Silent on Move' (The Statesman, 23 June 2020) <<https://www.thestatesman.com/world/china-occupies-nepal-village-lands-after-face-off-with-india-in-ladakh-oli-govt-silent-on-move-1502902937.html>> accessed 15 August 2020.

⁵¹ EurAsian Times Desk, 'After Ladakh, Nepal & Bhutan, China Now Claims Territory In Tajikistan' (EurAsian Times: Latest Asian, Middle-East, EurAsian, Indian News, 8 August 2020) <<https://eurasianimes.com/after-ladakh-nepal-bhutan-china-now-claims-territory-in-tajikistan/>> accessed 15 August 2020.

⁵² 'India Now Says 20 Troops Killed in China Clash' BBC News (16 June 2020) <<https://www.bbc.com/news/world-asia-53061476>> accessed 15 August 2020.

⁵³ Ipsita Chakravarty, 'How British Ambiguity about Frontier between India and China Paved Way for a Post-Colonial Conflict' (Scroll.in) <<https://scroll.in/article/965502/how-british-ambiguity-about-frontier-between-india-and-china-paved-way-for-a-post-colonial-conflict>> accessed 15 August 2020.

⁵⁴ '100 Days on, India-China Border in Ladakh Still Remains Tense - The Week' <<https://www.theweek.in/news/india/2020/08/13/100-days-on-india-china-border-in-ladakh-still-remains-tense.html>> accessed 15 August 2020.

⁵⁵ "Both India And China Have Limited Military Options In The Middle Sector" <<https://stratnewsglobal.com/both-india-and-china-have-limited-military-options-in-the-middle-sector/>> accessed 15 August 2020.

Indian defence and security systems.

Politico-economic realms

Independence was brought about in India on 15th August 1947 from British rule. The characteristics and the features of the country make it stand on a different footing from all the other countries of the world, although, right after the independence, the country faced end number of challenges of nation-building. With the formulation of the world's largest Constitution, India came to be known as the world's largest democracy. Moreover, the nationalization of the Indian army began with the thirteen Indian Major Generals and thirty Indian brigadiers and gradually the number of British officers began to decline by 1950. The religious, geographical, cultural, demographic and topographical features of the country depict India's strength of harboring great amounts of advantages to its politico-economic baggage. However, even after such competitive advantages, India has a poor record of fighting off the invaders.⁵⁶ The political realm of the country depicts it to be promoting federalism; however, it is known to be quasi federal in nature. The aim is to advance the ideal of democracy. India is known to be the land of diversity. The foreign policy, defence strategies and security aspects have seen to be evolving right from the Nehruvian theory to the Modian theory. The Nehruvian stream theory in foreign policy has often been questioned from two perspectives; conservative realist perspective and the second one is Hindutva, which is more driven by Hindu ideology.⁵⁷ The economy faced enormous challenges right after the independence, yet, under the Prime Ministership of Dr. Manmohan Singh, the economic boom took place when the GDP of India was over 8%, the highest ever number. The economic reforms which were being brought in 1991 transformed the country into the fastest growing economy. However, the explicit decline can be seen during the era of the present government.

Defence and Security strategy of India- The changing parameters

The security strategy of India has been evolving from time to time. The rise of India's regional and global power has been largely catered and reinforced by the

geostrategic weight that has been assigned to India naturally. According to Drekmeier, the real Great wall of India may instead have been its ability to protect and preserve a fundamental Indian civilization and to mitigate the cultural and the social effect of foreign invasions by the way of the caste system.⁵⁸ The projection of the power of India has been done both actively and passively. The security concerns that India has been facing time and again emerges from its neighboring countries and at times from within the territory of India itself. Since Independence, India has been adopting the security strategies of creating friendly and amicable relations with that of its neighboring countries so that threats can be reduced and they become minimal. Maintaining peace and security within the territory has also been challenging as regards to the internal perspective of India. The incidents of communal violence and riots as well as tensions and conflicts within the Northeastern and Southern region give rise to threats of security and integrity. The changing parameters of the security has brought new realms of the threats such as cyber attacks, environmental threats, maritime security, energy and biological security along with the concerns and threats of health. The recent instance of Novel Coronavirus has not only posed a great health security threat to India but it has paved its way worldwide. It has brought with itself several other security concerns and it is nothing less than health terrorism. The defence structure of India includes the Indian army, navy and Air force. The Indian military has been ranked at a great position from time to time.

Imminent Conundrums

The recent and the most imminent challenges are perceived to be the one which arise from the neighboring countries themselves. The recent break off with China has been the most excruciating factor in the Indian history of defence and security. The fact that Pakistan has always acted as a worst enemy with India, it becomes all the more important to note that the defence and the security gets at the verge of being harshly threatened. The neighboring countries like Nepal, Bhutan, Myanmar and Sri Lanka have always been in constant conflict with that of India and this creates a huge tensed situation for India. The foreign policies and the

⁵⁶ S.P. Cohen, INDIA: EMERGING POWER, 1st ed. 2001, p. 37-44.

⁵⁷ Ibid.

⁵⁸ C. Drekmeier, "Kingship and Community in the Early India", Stanford University Press, 1962, p. 69-80

international relations on the global level has been far more improved than ever before, however, the neighboring countries have often posed a great threat. The strained relationships reflect the international tensions and conflicts, thereby affecting the entire process of the growth, progress and development.

Conclusive remarks

In the light of the major facts and developments appraised, it has become clearly evident that the defence and the security aspects of India have been constantly evolutionary and extremely transforming. It is important to note that the concept of defence and security has never existed in isolation in the context of India. The policies of the foreign relation have been emerging from time to time with the changing nature of the internal political changes and transformations. It would be wrong to term the aspect of the defence and security system to be flawed altogether and the fictitious one as it is very much in existence. The need is to provide clear directions along with the strategic planning and management.

THE DEFENSE OF INDIA 2.0

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India & Relation with Neighbors –

India witnessed a huge upgradation in the defense system after a long time which is much required due to increasing number of enemy nations which are mostly connected with India through border lines, as India now have big enemy in the Northern Region, China and it's small ally Nepal who showed some Aggression to India, On the East, Small Nations but they're also Allies of China namely Bangladesh & Myanmar, On the South, an Island Nation Sri Lanka in which China bought a Port to develop it's sea routes in Indian Ocean & On the West, India's Oldest Enemy Pakistan which is also connected in many ways by China specially after the China – Pakistan Economic Corridor deal.

The India - China Standoff –

India and China had a history of conflicts, the conflicts related to Land, Water, Power, Economy, United Nations Permanent Seat, Security of different small nations & many more. Both the Nations got recognition and

freedom within a span of 2 years, both also shares a border of 3488+KM which is also the longest shared border with India, but china got its title as an expansionist nation, which expands its area to get control of more and more land, china also involved in border conflicts with 14 nations. This year from 5th of May China and India got into a border conflict on the Line of Actual Control (LAC) precisely on Galwan Valley, Hot Spring, Pangong Tso, PP17A Gogra, China deployed its Public Liberation Army (PLA) Troops into the area India also deployed Army into the border line to look into the Chinese army camps and activities. The aggression from both sides resulted in a clash in which 20 Indian Soldiers were Martyred and many got injured and 43 Chinese PLA Troops were killed and many got injured.⁵⁹ China first time since it's incorporation as a nation got such a befitting reply from its neighbor country this reply by Indian Army is considered as one of it's biggest nightmares.

Retaliation by India –

India took some bold steps in reply to china by deployment of gurilla army to creating ready for war Situation to breaking China's backbone & Raising issues to united nations, In this about to war situation India put themselves in front gear for retaliation as India has a Policy of NO FIRST WAR which also applied to this situation and India did the same until china created this situation, India took blatant steps to push china back –

Upgradation of Defense – India upgraded it's Defense systems to an another level by purchasing many fighter jets, jets, helicopters, missiles, bombs, army tanks, upgraded ArmaLight rifles, modified rifles, and many more which brought India's Defense into a fantastic position that a Pakistan official tweeted “India is purchasing Defense equipment beyond it's requirement.”⁶⁰

Attack on Economy – India did several strikes on Chinese economy started by people of India as Boycott China Movement, also India imports 5 times more than exports to china, in some sectors it is beyond 20 times difference in favor of china, due to this and many aspects India started a movement as “Atma Nirbhar Bharat”(self reliant India),⁶¹ under which India has cancelled crores of deals with Chinese companies and Chinese government, many Indian companies also dropped the deals with china which resulted as a blow for China, this

blow took more depth when government of India took a bold step of boycotting 59 Chinese apps who are in violation of data theft so to maintain the security of India.

Hong Kong to United Nations – India raised an year old Hong Kong issue to United Nations human rights council (UNHRC), This issue has been raised by India's permanent member Mr. Rajiv Kumar Chander during the 44th Human Rights meeting held in Geneva and also addressed that relevant parties should talk and sort the matter out.

“Breaking Bones” of China – India continuously doing the same retaliation in a similar kind of way they did to Pakistan after Pulwama Attack, from Pulwama attack to Air Strike for 11 days in between India retaliated daily on again and again basis by cutting supplies to break Allies. India is doing in the same manner to china but with a twist of a longer run retaliation, as removing china from highway projects to getting companies having production units from china to India, and Now Public sector units to stop chartering the tanker which have links to china.

India After Galwan Valley Clash –

The Defense acquisition council after the Galwan Valley Clash approved a number of arms projects to strengthen the Indian armed forces.⁶²

Mikoyan MiG-29 – The council approved to purchase 21 MiG-29 aircraft from Russia and also to upgrade 59 old MiG-29 with latest modifications, Mikoyan MiG-29 aircraft is a twin engine jet fighter aircraft manufactured by Russian Aircraft corporation MiG. This aircraft has a top speed of 2400Km per hour and a range of 1430 Km, they were purchased in 1999 during Kargil war scenarios and later on in 2013 as well. The new purchase and modification will be made out with a budget of 7418 Crore.

Su-30 MKI – The Sukhoi Su-30 MKI are also approved for 10730 to be made by local manufacturer Hindustan Aeronautics Limited, Sukhoi Su-30 MKI twinjet multirole

air specialist fighter aircraft with a top speed of 2120 KM per hour and range of 3000 KMs these were earlier manufactured by Russia, 2 Su-30 MKI were latest seen assisting 5 Rafale Jets while coming from France to Ambala Airbase.

Astra Missiles – Defense Acquisition Council has also approved Missiles with a long range of 1000KMs for Navy and Air Force. It is the first Air-to-Air missile of India which was created by Bharat Dynamics Limited, Defense Research and Development Organization (DRDO).

Pinaka Multi Barrel Rocket Launchers – Government recently asked for these rocket launchers which are designed and created by the Defense research and development organization (DRDO) which are used by the Indian Army.

M777 Howitzers – Government of India also approved to purchase Excalibur artillery rounds of M777 ultralight howitzers on an emergency basis from the United States of America.

SPICE Bombs – 2000 SPICE Bombs were approved to be brought from Isreal these Bombs were also used during the Balakot Air Strike which lead the retaliation of Pulwama Attack, These bombs have an extreme capacity to blow everything beneath it within seconds.

Spike Anti-tank Guided Missile – These missiles were also brought from Israel these same Missiles were also brought a year back and deployed after the Balakot Air Strike to cover if any activity on the border area happens.

Heron Drones – Israel is the best example of defense, retaliation & attack. Nobody thinks of doing what they do, these drones were also brought from Israel to keep an eye on the enemies. These drones are specially used by All three wings of Indian Armed Forces and they're using them for years.

BMP 2 – Government of India sanctioned to get 156 Sarath vehicles also known as BMP2 which will be manufactured by Ordnance Factory Medak, which is

⁵⁹ Rahul Singh, Hindustan Times <https://www.hindustantimes.com/india-news/a-timeline-india-china-s-deadliest-border-clash-since-1975-explained/story-9Ct6IHQKkRuXM5w2K5xmwO.html> (last updated 17th of June 2020)

⁶⁰ Times Now Bureau <https://www.timesnownews.com/india/article/spooked-by-rafales-pak-says-india-continues-to-amass-military-capabilities-beyond-its-security-requirement/629548> (last updated 30th of July 2020)

⁶¹ Prime Minster of India announced Aatmanirbhar Bharat campaign on 12th of May 2020 <https://www.india.gov.in/spotlight/building-atmanirbhar-bharat-overcoming-covid-19>

⁶² Vivek Raghuvanshi, Defense News on 6th of July 2020 <https://www.defensenews.com/global/asia-pacific/2020/07/06/india-accelerates-weapons-purchases-in-wake-of-border-clash-with-china/>

under Ordnance Factory board and also comes under the Make in India Initiative.

Rafale – After a long delay and long time wasted India got 5 Rafale as promised by Dassault Aviation (a French based defense equipment company) on 27th of July 2020 which boosted the whole nation with confidence and patriotism.

India not just upgraded its Defense system but showed the world the power of India, a India who can go to any extent to defend every single inch of its land, a famous quote by our former President of India APJ Abdul Kalam said “Only Strength Respects Strength”. Which is interpreted as unless India stands up to the world no one will respect India, this quote perfectly fit with India increasing its Defense abilities and capabilities to another level the 2.0.

THE SPACE DEBRIS CRISIS: LEGAL STATUS

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Introduction

Space Debris differs greatly from a Space Object. There is an absence of proper definition, however the first attempt was made in the 66th International Law Association's International Instrument on Space Debris⁶³ where para (c) of the draft defines Space Debris as “an man-made objects present in outer space, they are mostly non-functional satellites or parts of the satellite and it is called so when any change on it will not bring result in the foreseeable future”⁶⁴ Thus, we can say that Space Debris are the basic waste particles from satellites which are non-functional and are creating environmental pollution in outer space which is a major crisis of the era.

To have a bird's eye view about the crisis, it is important to be aware of certain statistics and figures. The European Space Agency states that

“There are about 5560 (excluding failures) rockets that have been launched in space since 1957, There are about 9600 satellites that the 5560 rockets have launched and still about 5500 are in space out of which only 2300 function means that the other 3200 have

become space debris. Further, about 22300 debris can be tracked by Space Surveillance regularly and there have been about 500 explosions or collisions within this space debris further giving birth to other debris, they also say that total mass of all space objects currently in Earth Orbit can be said to be more than 8800 tons. Thus, talking about space debris object in specific it can be said that there are more than 34000 objects of 10 cm, 900000 object within 1 cm to 10 cm and lastly 128 million object from 1mm to 1 cm which has formed the total set of debris in Space.”⁶⁵

The Space Debris have many deadly consequences which have been discussed earlier in many prime conferences and many states have started taking active steps but that is not enough a proper legal model for Space Debris Remediation is particularly important.

Legal Status

In this case, it is important to understand that the Space Law had taken its structure long before Space Debris was detected as an environmental Hazard. There are five treaties which can be stated to be the mother of Space Law namely- The 1967 Outer Space Treaty (OST),⁶⁶ The 1968 Rescue Agreement,⁶⁷ The 1972 Liability Convention,⁶⁸ The 1975 Registration Convention,⁶⁹ and The 1979 Moon Agreement.⁷⁰ These developed treaties cover mostly all aspects of legal dimensions and disputes of space law, however it does not have anything in specific in regard to Space Debris, nonetheless interpretation can be made of these laws to talk about the Space Debris mitigation.

The outer space treaty also known as the constitution of space law in its Article VI declares that all states who are party to this treaty need to keep into consideration the “international responsibility” for conducting any “national activities in outer space.”⁷¹ Further, Article VII makes the party to this treaty liable internationally for damage caused by the space object or its components that they will launch or have already launched into space. Finally, Article IX allows the party who have reason to believe that their activity or launch may have some potential threat to the environment have a “requested Consultation.”⁷² The Liability convention makes states liable for damage which has been caused by their launched space object to some other nations or person

⁶³ 66th Conference, Buenos Aires 1994

⁶⁴ Karl-Heinz Böckstiegel, “ILA Draft Convention on Space Debris” (1995) 44 ZLW 29.

whose property has been affected through it.⁷³ The Registration Convention seeks all its parties to inform the UN about all objects they are launching along with its orbital parameter. Article VI directs states having facility to “monitor” or “track” aid UN in “identification of space objects that caused damage.”⁷⁴

While these three treaties talk and mention bits and cons of Space Debris it also leaves out a lot. For example, it does not talk about possible measures that should be used immediately to slow down the process of Space Debris boom, it also does not talk about what happens if a space debris causes some harm and is not catalogued and in turn unidentifiable. Lastly, the very word Space Debris is not properly defined and mere interpretation in a court of law can lead to possible side effects.

Recommendation

As for the purpose of recommendation it is safe to reiterate the findings of “International Congress on Space Debris Remediation” which recommended that laws should be made on the following heads:⁷⁵

- Cost-Effective Technique for Space Debris Mitigation be conducted in each party state.
- A proper legal guideline about “alternative use” concerns.
- Proper Funding for the time being regarding R & D for developing techniques which can be utilized in the future
- Accurate tracking, monitoring and registration law for being able to identify each space debris
- Advance technology and clear jurisdiction law in case of determining “capability to locate, approach,

connect deorbit/servicing device, control orientation and to move the target object to desired destination”

- Defined Liability Law regarding “safety of the public on the ground, at sea, travelling by air and in space.”

Conclusion

To conclude, we need to understand that there is no proper law in regards to space debris, however, we can consider that “objects” have a wider interpretation and that space debris are “component parts” of the “objects launched into outer space”.⁷⁶ Thus, the distinction needs to be made between fragments, debris, and wrecks. Some law particular to this aspect must be established as soon as possible to limit space debris. Only limiting space travel may not be the solution but continuous cleaning is the only option.

⁶⁵ The European Space Agency, The latest figures related to space debris, provided by ESA's Space Debris Office at ESOC, Darmstadt, Germany (Information correct as of February 2020). Available at: https://www.esa.int/Safety_Security/Space_Debris/Space_debris_by_the_numbers (Last Visited 10th August 2020)

⁶⁶ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies; 610 UNTS 205; entered into force on 10 October 1967.

⁶⁷ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space; 672 UNTS 119; entered into force 3 December 1968

⁶⁸ Convention on International Liability for Damage Caused by Space Objects; 961 UNTS 187; entered into force 1 September 1972.

⁶⁹ Convention on Registration of Objects Launched into Outer Space; 1023 UNTS 15; entered into force 15 September 1976.

⁷⁰ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies; 1363 UNTS 13; entered force 11 July 1984.

⁷¹ Arnel Kerrest, “Liability for Damage Caused by Space Activities” in

Marietta Benkő & Kai-Uwe Schrogl, *Space Law: Current Problems and Perspectives for Future Regulation* (Utrecht: Eleven International, 2005) at 107.

⁷² Hurwitz, *State Liability for Outer Space Activities*, note 23, at 147.

⁷³ Liability Convention, Art II.

⁷⁴ Registration Convention, art I(a).

⁷⁵ UNCOUOS. Active Debris Removal—An Essential Mechanism for Ensuring the Safety and Sustainability of Outer Space A Report of the International Interdisciplinary Congress on Space Debris Remediation and On-Orbit Satellite Servicing; UN Doc. A/AC.105/C.1/2012/CRP.16; 27 January 2012. Available at: http://www.unoosa.org/pdf/limited/c1/AC105_C1_2012_CRP16E.pdf (Last Visited 14 August 2020).

⁷⁶ Kessler, D.J.; Cour-Palais, B.G. *Collision Frequency of Artificial Satellites: The Creation of a Debris Belt*. JGR 1978, 83, 2645.

Appreciation for CADL NALSAR

CADL- a Centre of Excellence in Aerospace and Defence Law studies

Centre for Aerospace and Defence Laws (CADL), which was established in 2005 at NALSAR University of Law, has been contributing significantly for the promotion and development of aviation, space, maritime and defence laws and policies, matching with its objectives. It offers quite a few value-added courses at PG and PG Diploma levels on various themes in aerospace and defence laws for the working professionals, and serving defence officers to understand the legal perspectives of their respective work domains and to ensure compliances therein. Further, it supports students with science, engineering, technology and management background to seek for right placements in the burgeoning aerospace and defence industry within the country and abroad.

Conduct of National and International Conferences periodically on contemporary topics besides regular ones such as 'International legal and policy conference on the future of Transport' on annual basis, by the Centre certainly support enriching the knowledge of students and many other stakeholders from aviation, space and defence industry, and researchers. Further, CADL has been publishing Newsletters, Journals, Books and Articles, besides awarding a few M.Phils. and Ph.Ds.

The curricula of the courses offered by the Centre through the Directorate of Distance Education (DDE) of NALSAR includes Two-year M.A courses in Aviation Law & Air Transport Management, Security & Defence Laws, Maritime Laws, Space & Telecommunication Laws and One-Year PG Diplomas in Aviation Law and Air Transport Management, Advanced Maritime Laws, and GIS and Remote Sensing Laws etc., are uniquely designed and customized to the needs of the working professionals in respective fields in terms of content and convenience of learning. The Personal Contact Programmes (PCP) conducted either on virtual mode or on physical presence mode really support the understanding of the subjects and interacting with the faculty at par with regular courses. Lectures by experts of respective fields and making them available for access at any time in the website is really the hallmark of the courses. The project assignments certainly help assimilating the knowledge acquired for various practical and hypothetical situations under the given subjects. Semester based examinations test the creativity and true knowledge of the students in broader perspectives.

As an engineer with additionally acquired legal studies in General Laws and Patents laws, served in the Indian Space Research Organisation over 30 years, in the management areas including Project management, Intellectual Property Rights management, Technology Transfer & Industry cooperation, International Cooperation etc., and specialized in Space law and Policy matters for 15 years, self was interested to learn security and defence laws and joined the PG Course at NALSAR in 2019; upon completion of this course, I am really benefitted with sufficient knowledge in these areas through CADL.

My sincere thanks and heartfelt appreciations to Prof. (Dr.) V. Balakista Reddy, who is the mastermind for the creation of CADL and the backbone for the successful sustenance of the course. His vast knowledge in air and space law over thirty years and pioneering research in space law in India in 90s itself, has really helped to conceive and conduct various courses that are offered through CADL. The patronage and guidance provided by Prof. Faizan Mustafa, Vice-Chancellor, NALSAR University of Law, to CADL are laudable. The success of CADL is to be attributed to all the faculties in various capacities and the research associates and support staff.

V. Gopalakrishnan

Former Policy Analyst (Space Law & Policy), ISRO

"Since I work within the field of defence policy, I was looking at upskilling while continuing with my career. NALSAR's Defence and Security Laws MA program was exactly what I was looking for. The course has been designed meticulously and while online, the one-week theory classes are really intensive. The program gives us enough flexibility to conduct research on topics that coincide with either our work, or our areas of interest. I look forward to adding credentials from this esteemed university and being its proud alumni."

Jeethu Elza Cherian Chacko
Research Officer (Defence Section)
Australian High Commission, New Delhi

My Heartfelt greetings to all the faculty and staff of CADL, NALSAR. It gives me immense pleasure to be part of this journey and successfully completing MA (Security and Defence Laws). It has been a tough call in the last couple of years to continue with the academic schedule since life passed through various hurdles and uncertainties for each one of us due to the pandemic. However, the CADL made its undeterred efforts in conducting classes and examinations at the earliest opportunity possible by ensuring the quality and standards which are set forth always.

This has enabled the students to continue studies with focus, ensured them not to lose out their valuable academic time and accrue invaluable benefits of life time. Congratulations to all the Students.

Wg Cdr Garigipati Srinivasu (retd)
MASDL48_19

The sessions were very informative and helpful. -

D.Santoshi Kumari,
M.S.S.LAW College, Osmania University, Hyderabad

VERY USEFUL & EXCELLENT -

PRAHALATHAN M, New Mangalore Port Trust (NMPT)

When knowledge speaks, the environment changes. A special vote of thanks to all the Honourable Panelists and the eminent speakers. Efforts of all the people, who made it possible, are much appreciated. Thank you for conducting such an informative session. Please conduct such Webinars more frequently like on a monthly/quarterly basis as it keeps the real education alive. Interaction with knowledgeable and learned individuals makes a lot of difference and bring in a lot of value in all ways in all walks of life. It was truly enlightening. Thankful for getting this opportunity to take so many learnings. Looking forward for more such sessions.

Anchal Ghai,
Osmania University Department of Law

All the Five sessions of Webinars were informative well Hosted and presented by the Guests, hope all the law aspirants were gained the knowledge and pros and cons of diploma courses in the subject matter of webinars, eagerly waiting to participate in future webinars if any. Particularly Thanks to Tariq Sir and Lakshmi Madam who are the main pillars in conducting such informative webinar.

P SHIVA KUMAR MUDALIAR,
ANANTHA LAW COLLEGE affiliated to OSMANIA UNIVERSITY, HYDERABAD

All the sessions were really very good and have given good summary for the various opportunities and knowledge which is unexplored. The sessions have created enormous curiosity for taking up the new courses and adding feathers in our carriers.

Mohammed Shakeel Ahmed
Abu Dhabi Aviation

Very well organized sessions and are of immense value duly highlighting the emerging areas and their potential. Sincerely appreciate the proactive role of Dr. Balakishtha Reddy sir and his team in arranging the sessions.

M. Subramanyam,
Controller, HSFC, ISRO, Bangalore

WOW it was very amazing and interesting session and exposure. I really admired all guest lecturers, hosts and organizers. Special thanks to NALSAR University of Law and Prof. (Dr.) V. Balakista Reddy. Keep it up.

WENDEMAGEGN WERKNNEH MEKONEN,
NALSAR UNIVERSITY OF LAW

That's was really good webinar series. Actually I learned so much, and it was really attractive. As a foreign student it was a rare opportunity for me to learn from those resource persons. Thank you so much sir.

Ranasinghe Pathiranage Dinithi Nimesha Ranasinghe
Nalsar University of Law

I had gained a lot of knowledge about the above stated specifications. As I am not aware of these many opportunities that are going to be the future of law. So, I was overwhelmed by this webinar.

Pranavi Siripurapu, Smt Velagapudi
Durgamba Siddhartha Law College

Wonderful and thought-provoking information on 5 various subjects (Aviation; Defence; Maritime; Space and Remote Sensing) of equivalent importance and emerging areas of research studies.

Dr. Shaik Nazim Ahmed Shafi,
Asst. Professor
NALSAR University of Law

Excellent set of webinars. Lot of knowledge and information. Speakers were brilliant who scripted their talk within the stipulated time and aim of the topic.

SAURABH KARMAKAR
Indian Air Force

The events were very good and informative. More such subject-wise events will be more welcome. The experts too were big names in the field. So, thank you.

Bipindra NC
Hindustan Legal Solutions

Really good efforts from you guys. I had a great time & acquired knowledge. I look forward to hear from you guys for more programs like this.

DARGAVALI SHAIK
Telangana University

Very helpful session please repeat such a wonderful and knowledgeable views of such a great personality .Thanks for conducting a wonderful session

RAJNESH KUMAR
INDIAN AIR FORCE

It was a wonderful experience as the webinar enlightened about certain rare and valuable areas of study. Thank you Nalsar.

Deepraj S Ambat
New Mangalore Port Trust

Thank you so much for conducting such webinars, it gave insights about the various opportunities in the different sectors.

MALAY KUMAR SINGH
INDIAN AIR FORCE

Very good session for understanding of future development and growth on these sector. expecting more sessions in future.

Ullas U
Airasia india ltd





CENTRE FOR AEROSPACE AND DEFENCE LAWS (CADL)

DIRECTORATE OF DISTANCE EDUCATION

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ADMISSION NOTIFICATION

Two-Year M. A. (Aviation Law & Air Transport Management)

Course Fee : Rs.40,000/-p.a. (SC/ST/PWD Category-38,000/-p.a.) (Defence personnel-Rs.35,000/-p.a.)

For Advanced Diploma Candidates for Second Year M.A.: Rs. 50,000/- (SC/ST/PWD Category - Rs. 47,500/-), (Defence personnel - Rs.45,000/-)

Eligibility : Bachelor's Degree or an equivalent Degree in any discipline from any recognized University; or 3-year Degree/Diploma in Aircraft Maintenance Engineering (AME)

Candidates appearing for the final year examination of Graduation / Engineering are also eligible to apply. In such a case, the admission will be subject to the submission of the passing certificate of the qualifying examination on or before September 30, 2021.

Two-Year M. A. (Security & Defence Laws)

Course Fee : Rs. 40,000/-p.a. (SC/ST/PWD Category-38,000/-p.a.) (Defence personnel -Rs. 35,000/-p.a.)

Eligibility : Candidates appearing for the final year examination of Graduation / Engineering are also eligible to apply. In such a case, the admission will be subject to the submission of the passing certificate of the qualifying examination on or before September 30, 2021.

Two-Year M. A. (Space & Telecommunication Laws)

Course Fee : Rs. 40,000/-p.a. (SC/ST/PWD Category-38,000/-p.a.)

Eligibility : Bachelor's Degree or an equivalent Degree in any discipline from any recognized University; or

Candidates appearing for the final year examination of Graduation / Engineering are also eligible to apply. In such a case, the admission will be subject to the submission of the passing certificate of the qualifying examination on or before September 30, 2021.

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Eligibility : Bachelor's Degree or an equivalent Degree in any discipline from any recognized University; or

Candidates appearing for the final year examination of Graduation / Engineering are also eligible to apply. In such a case, the admission will be subject to the submission of the passing certificate of the qualifying examination on or before September 30, 2021.

One-Year Advanced Diploma (GIS & Remote Sensing Laws)

Course Fee : Rs. 30,000/-p.a. (SC/ST/PWD Category - 28,500/-p.a.)

Eligibility : Bachelor's Degree or an equivalent Degree in any discipline from any recognized University; or

Candidates who complete three years of their 5-Year Integrated LLB Degree Programme in Law are also eligible to apply; or

Candidates appearing for the final year examination of Graduation/ Engineering are also eligible to apply. In such a case, the admission will be subject to the submission of the passing certificate of the qualifying examination on or before Sept. 30, 21.

One-Year Advanced Diploma (Maritime Laws)

Course Fee : Rs. 30,000/-p.a. (SC/ST/PWD Category - 28,500/-p.a.) (Defence personnel - Rs. 25,000/-p.a.)

Eligibility : Bachelor's Degree or an equivalent Degree in any discipline from any recognized University; or

Candidates who complete three years of their 5-Year Integrated LLB Degree Programme in Law are also eligible to apply; or

Candidates appearing for the final year examination of Graduation/ Engineering are also eligible to apply. In such a case, the admission will be subject to the submission of the passing certificate of the qualifying examination on or before Sept. 30, 21.

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For further details visit:

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Sd/-

Prof. V.Balakista Reddy
Registrar & Director, CADL



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