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Indian ocean trade dynamics: Implications for economic advancement in the south Asian region

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Abstract

This paper examines the complexities and possibilities of engaging in trade in the Indian Ocean within the South Asian context. This study will examine the historical context of Indian Ocean trade, clarifying the diverse historical, geopolitical, and ethnic factors that influence the region. The analysis will discuss the development of the Indian economy via regional and transregional trade networks inherently connected to the Indian Ocean. Additionally, it will offer a succinct analysis of current security issues in the Indian Ocean Region (IOR) and outline the economic framework of South Asia. The paper will examine the evolution of financial relationships in the region, evaluate the dual function of the environment-comprising both environmental hazards and its economic importance-and conclude with a call for the strengthening of cultural and ethnic bonds as essential components in promoting regional integration via Indian Ocean trade.

Keywords: Indian ocean, trade, India, South Asia, Sri Lanka, dynamics

Introduction

Historical Context of Indian Ocean Trade

The trade relationships between South Asia and the expansive Indian Ocean world highlight a notable historical significance. South Asia has long served as a critical gateway for Indian Ocean commerce, with its ports playing a vital role in developing trade routes that connected markets throughout South and Southeast Asia. This synergy has allowed the western edges of the Indian Ocean to become essential conduits for the movement of goods and people across Africa and Asia. Over the years, this intricate network evolved, with wheeled carriages emerging from the thriving highways of Godarat on India's western coast, extending into the Deccan Plateau and reaching as far as Kul Paresi and Samarcand. These connections not only reflect the region's importance in historical trade dynamics but also emphasize its lasting impact on global commerce.

A distinct trade route extended into the Arakan Hills and Tampakam, integrating with the copper economy of the Keladi-Telugu empire ^[1]. Other pathways navigated through Ceylon and Pegu, advancing into China via overland routes and maritime pathways along the Yunnanyi Mekong river basin and the Western Hundred Bends trade highway. Some routes successfully connected the Hellenic realms of the eastern Mediterranean, like Alexandria, with China through desert crossings and sea routes. Meanwhile, Asian communities thrived in the bustling ports of the western Mediterranean. Regions such as Peking and the coasts of India, propelled by Western global exploration and colonial aspirations, began to establish settlements on the far side of the Pacific. In these vibrant port cities, often nestled outside predominantly 'white' settlement areas, enduring communities of Chinese, Japanese, and Indian descent have flourished. Thus, the harbours of the Indian Ocean represented not just sheltered sanctuaries but also pivotal junctions in a sprawling network across the oikumene.

The waters surrounding the South Asian region have a long history of maritime trade, dating back to ancient times. Throughout both pre-classical and classical antiquity, South Asia was home to one of the earliest seaborne networks of harbours, towns, and ports in Asia, which thrived for nearly two millennia, approximately between 300 BCE to 1900 CE. This extensive network included connections extending southward and eastward to key resource areas. Notably, seaports along the coasts of China and the Philippines served as important entrepôts on the southern sea route. The trade patterns encompassed both internal' elements;

the former primarily involved 'bulk trade' while the latter focused on 'high-value' goods. The multi-functional harbours were central to these trading circuits, which played a crucial role in facilitating commerce.

The vast expanse of the western Indian Ocean served as a significant conduit, intricately connecting the staple-producing regions of South Asia with the commercial hubs of Arabia, East Africa, and the Mediterranean. Geographically, this aquatic realm was in proximity to the populous centres of the Mediterranean, the Middle East, and the South Asian hinterland. The strategic prominence of India was further enhanced by the dissemination of Islam, which not only solidified this geopolitical landscape but also transformed it into a pivotal nexus of interaction between Europe and the East^[2]. Throughout both the pre-Islamic and post-Islamic eras, key ports along the Indian coastline such as Seylap, Ceylon, Gadaram, Mabar, and those further west along the Persian Gulf emerged as essential nodes and beneficiaries of a dynamic flow of trade commodities. On an external scale, this trade network interconnected prominent locales along the Southern Sea-Rim, including South India, Ceylon, Sumatra, and Java regions. Concurrently, an internal linkage was established, traversing the arid northwestern territories and the Mekran coastal area, ultimately leading to the rich civilizational sphere of Persia.

Impact of colonialism

The significance of the Indian Ocean trade was emphatically highlighted by Portuguese Captain Albuquerque in the early 16th century, particularly after they secured dominance over the Strait of Hormuz, a crucial gateway to the Indian Ocean. He famously remarked, "He who is the Lord of Malacca has his hand on the throat of Venice," underscoring the strategic power tied to this trade route. At that time, the fertile plains of the Indus and Ganges had fallen into neglect, severely impacting the dynamics of the Indian Ocean trade. This shift led to the emergence of a new form of Asian sub-imperialism, characterized by state corporations that operated these essential controlled ports. The Dutch East India Company made its mark in the region even before formal colonial governance took shape. Meanwhile, the French East India Company strategically allied with the Kings of Madagascar and the Sultanates of the Comoros, Zanzibar, and others. Similarly, the British and various European companies established connections with Assam and the Sultanates along the Gujarat coast. The key distinction between earlier and later Asian trade lies in the fact that the old traders struggled against state controls, whereas the East India Companies collaborated with local kings, forging a new era of joint Asian sub-imperialism.

The historical trade routes connecting Asia with the East African Coast, the Arabian Sea, the Persian Gulf, and the Red Sea have long served as vital cultural and economic exchange pathways. Today, these routes have evolved into intricate interactions that transcend national boundaries, particularly between the Indian subcontinent and its neighbouring countries in southwest Asia. However, despite the formal end of colonialism, its enduring legacy continues to shape the region's economic structures. The colonial era has left a framework that fosters dependency, often referred to as neo-colonialism, where economic relationships remain skewed in favour of dominant players. In light of this historical context, the countries in this region face a crucial

challenge: the urgent need to construct a cooperative world order that prioritises collective growth and mutual benefit. This initiative is not merely aspirational; it is essential for forging just and equitable economic relationships that can facilitate peaceful coexistence among nations. By working together, these countries can dismantle the remnants of colonial economic practices and replace them with partnerships that empower all stakeholders. Such a cooperative approach is vital for addressing past injustices and laying the groundwork for sustainable economic development^[3]. By promoting shared prosperity and equitable trade practices, the nations of this region can ensure a future where economic growth is inclusive and empowers all communities. Ultimately, the task at hand is to create a more balanced and fair economic landscape, one that not only acknowledges the historical complexities of the region but also paves the way for a prosperous and harmonious existence among its nations.

Post-independence era

The political and socio-economic landscape in the Indian Ocean witnessed a significant transformation during World War II and in its aftermath, primarily due to the weakening of two dominant colonial powers: the United Kingdom and France. Their decline left them ill-equipped to suppress the rising movements for self-determination among colonies across Southeast Asia, the Middle East, and East and North Africa, all of which were deeply affected by the war. The roots of anti-colonial movements in South Asia trace back to the 1930s. India's early leadership in this struggle, dating as far back as the 1920s, sparked a renewed sense of hope across the region. This momentum provided the populace with the chance to actively oppose colonial rule and imperialism during and after World War II, laying the groundwork for a robust fight for independence. The defeat of Japan and Germany in 1945 was not just a significant turning point in World War II; it also ushered in a new era of global governance aimed at addressing the aspirations of colonized nations. The establishment of key institutions, such as the United Nations Organization, the International Monetary Fund, and the World Bank, created a framework that supported decolonization and championed the rights of nations seeking independence. These organizations reinforced the idea that self-determination is a fundamental right, inspiring countless movements that challenged colonial rule. India emerged as a powerful example of resilience and determination^[4]. After a prolonged struggle marked by various forms of resistance, advocacy, and negotiation, India successfully gained independence in 1947. This remarkable achievement was the result of a concerted effort that utilized constitutional processes and institutional mechanisms, highlighting the effectiveness of organized political action in the face of colonial oppression. In the post-independence era, several countries pursued imprudent import substitution strategies marked by 'negative protection,' often bolstered by support from the United States. Meanwhile, some nations focused on Import Substitution Industrialization (ISI) through initiatives led by IIT and Planning and Development Advisory Boards for the Colombo Plan countries. Notably, India distinguished itself by adopting a balanced approach, combining the Free Trade Policy with the Import Substitution Strategy. This strategy was essential for building national capabilities and transforming the region's identity from its colonial past to a

more positive narrative, emphasizing that while colonialism had adverse effects, trade can foster mutual benefits and development. The era of colonial trade has come to an end, giving way to a mixed landscape of successes and challenges marked by uneven achievements and disparities among member countries. Former colonial territories have evolved into nation-states, all of which are now recognized as members of the international community under global law. The United Nations serves as a vital platform for fostering cooperation among these nations.

Theoretical framework

The Indian Ocean serves as a crucial axis for understanding extensive trade networks, functioning both as a conduit for commerce and as a facilitator of cultural exchanges among diverse civilizations. The exploration of these trade practices reveals the longstanding economic ties that have been established over centuries, predating the advent of modern globalization. To comprehend the transformations within South Asian economies today, it is imperative to consider the colonial influences that have historically shaped trade dynamics. This inquiry will be anchored in several theoretical frameworks. World Systems Theory, articulated by Immanuel Wallerstein, provides a critical lens to examine the intricate connections between the Indian Ocean and broader global economic structures, highlighting the differentiated roles played by core, semi-peripheral, and peripheral states. Furthermore, Dependency Theory addresses historical trade relationships that engendered economic dependencies, thereby illuminating the contemporary conditions within South Asia. By employing these theoretical perspectives, one can critically analyze the complexities of trade and its enduring impact on regional economies.

To effectively understand the transformation of trade dynamics in the region, it is essential to closely examine the implications of Neoliberal Economic Theory. This framework will reveal how structural adjustments, market liberalization, and deregulation have collectively reshaped trade relationships and significantly boosted economic growth. Additionally, Institutional Theory will play a crucial role in analyzing both formal and informal institutions spanning maritime laws to regional trade agreements that influence trade practices and enhance economic collaboration. We will also investigate established trade theories like Comparative Advantage and Trade Liberalization to assess their relevance in the context of the evolving Indian Ocean trade landscape. This thorough analysis will illuminate how globalization has not only disrupted traditional trading patterns but also fostered deeper economic interdependence among South Asian nations, thereby enriching their economic interactions and paving the way for future growth.

The economic implications of trade dynamics are crucial, making it imperative to delve into Economic Integration Theory, particularly in the context of regional initiatives like the South Asian Association for Regional Cooperation. By examining how these initiatives reshape trade relationships, we can uncover essential pathways for sustainable economic growth. Additionally, the importance of robust infrastructure such as efficient maritime routes and strategically located ports cannot be overstated; this infrastructure is fundamental to enhancing trade efficiency and driving economic development. Equally critical is our

commitment to sustainable development, ensuring that our trade practices not only foster economic progress but do so in a way that is responsible and aligned with environmental stewardship. The effects of trade extend well beyond the economic sphere; they significantly influence social and cultural realms. We will explore how trade impacts social structures, encourages cultural exchanges, and enriches human capital throughout South Asia.

Geopolitical significance of Indian ocean trade

The Indian and Pacific Oceans host a significant military presence from various global powers, which plays a crucial role in international trade. While the importance of merchant shipping along major trade routes is often emphasized, it's essential to recognize its critical value. Nations involved in maritime activities manage their energy resources, transportation routes, defense systems, and conflict evacuation strategies, all of which shape the operational realities of the region. This context challenges the simplified narratives, such as China's "string of pearls" strategy, that attempt to depict the situation only in terms of rising anti-access and area denial capabilities. The dynamics at play here can deeply affect both developing regions and areas of diminished conflict potential, emphasizing the global significance of trade and the interconnectedness of the world's commerce.

The majority of their bulk oil tankers and merchant cargoes traverse a fire zone in a section of the Indian Ocean. Sea trail revenues this week account for up to 15% of the total global procurement deficit, alongside 7% of the worldwide LNG supply. Additionally, there is a substantial \$104 billion worth of vegetable oil in play. Tariffs are limited to just \$135 billion, impacting only \$10 billion in interest subsidies for computer chips, as well as their associated EU and US regulators from Asia. Meanwhile, the Southeast Asian seas continue to grapple with a complex situation while the predominant government maintains a significant international military presence. This increase in trade has also led to a rise in the number of weapons and military bases tied to the region's ordinary trade activities and preferences^[5].

India stands as one of the world's oldest trading civilizations, with the Indian Ocean trade playing a pivotal role in the evolution of global commerce from ancient times to the modern era. Before World War II, colonial powers dominated sea trade in the Indian Ocean, a direct result of Euro-American naval superiority. However, the discovery of vast petroleum resources in the Middle East during the war shifted the landscape of maritime strategy profoundly. Today, in times of peace, these critical sea lanes serve as the primary conduits for transporting immense quantities of oil and gas from major producers to the highly industrialized nations in the developed world, underscoring their strategic significance in our interconnected economy. Today, over sixty-five per cent of global trade, including crucial oil shipments, relies on maritime routes designed by human ingenuity. Among these routes, an astonishing two-thirds traverse the Indian Ocean, the soft underbelly of Southern Asia. The surge in economic activity and the pivotal strategic significance of this ocean has prompted a substantial military presence, not just from regional players but also from extra-regional powers. Nations like the United States, Russia, Japan, China, France, and the United Kingdom are eager to secure their strategic interests in the

Indian Ocean, vying for influence in this critical arena. Since 9/11, the region has also become a hotspot for piracy, jeopardizing vital Sea Lines of Communication (SLOCs) and heightening security concerns. India, with its clearly defined maritime ambitions, is poised to assert its role in the Indian Ocean while balancing development and security dynamics^[6]. This interplay of interests makes the Indian Ocean an intriguing maritime corridor of global significance.

The South Asian region, characterized by its internal and external states, stands as a pivotal hub for trade connecting to the global South. The maritime trade across the Indian Ocean has experienced remarkable growth, mirroring the economic advancements among the Rimland of this ocean. Notably, over 80% of the world's oil essential for global energy security transits through the Indian Ocean, prompting substantial investments from nations within both the littoral and rimland areas. However, the Indian Ocean trade route faces significant challenges as it becomes increasingly securitized, driven by the rise of Anti-Access/Area Denial (A2/AD) strategies aimed at preventing any hegemonic powers from dominating the region. Trust among nations in the Indian Ocean is at a historic low, further aggravated by security threats arising from ongoing maritime tensions and environmental degradation. To effectively address these strategic depth challenges, it is crucial for regional states to foster strategic interdependence, particularly through enhanced security cooperation, to collaboratively mitigate common threats and reduce the securitization of the region as outlined in the appendix.

The vast expanse of the Indian Ocean presents a multitude of security challenges. In 2010, piracy off the coast of Somalia resulted in damages estimated at one billion dollars. Between 2005 and 2012, it is believed that between 21,000 and 33,900 hostages were affected by piracy incidents. This issue has garnered international attention, prompting a coordinated military response from various countries that have taken on a multinational framework aimed at combating the pirates. The Malacca Strait is recognized as the second most vulnerable region to piracy after Somalia, with Southeast Asian littoral states struggling to effectively address this threat. Additionally, the intensifying competition between China and India is setting the stage for a potential "maritime cold war" in these waters. Furthermore, both the Pacific and Indian Oceans have witnessed China implement its anti-access and area denial systems, effectively obstructing major oil tankers from establishing dominance in the South Asian and Pacific regions.

Economic potential and trade dynamics

The Indian Ocean stands at the heart of the South Asian region, offering not just maritime security but also immense economic opportunities for the nations within its reach. Rich in invaluable mineral resources and significant economic potential, this ocean is crucial for global trade. Approximately 80 per cent of the world's hydrocarbon imports traverse these waters, highlighting the region's pivotal role in energy supply. Major Asian economies rely heavily on oil and commercial goods sourced from the Middle East, establishing it as the most vital trade route globally. The Malacca Straits, linking the Indian Ocean to the South China Sea, handle half of the world's container

traffic and a third of its overall maritime traffic^[7]. With nearly 40 per cent of the global population depending on it and over 40 per cent of the world's oil imports passing through, the importance of the Indian Ocean cannot be overstated.

The Indian Ocean stands as one of the fastest-growing trade routes globally. Its strategic geographical position links Asia with Africa and, following the opening of the Suez Canal, extends connectivity to Europe and South America, transforming it into one of the most lucrative maritime corridors. With around 70,000 vessels navigating these waters annually, the economic significance is undeniable. However, the security of these trade routes is susceptible to the influence of both regional and extra-regional powers controlling critical chokepoints like Hormuz and Malacca. These essential sea lanes are often plagued by hijackings and piracy, notably by Somali pirates, which disrupts international and regional commerce. In response, major trading nations have forged operational agreements and alliances prioritizing security—spanning energy, goods, currencies, and port activities—all rooted in economic necessity. Key collaborations, such as the Asia-Europe Meeting, BRICS Summit, BIMSTEC, Asia-Pacific Economic Cooperation (APEC), Association of Southeast Asian Nations (ASEAN), East Asia Summit, and Indo-Pacific Regional Dialogue Mechanism, enhance trade dynamics among participating nations, ensuring a more secure and prosperous trading environment for all involved. The Indian Ocean is strategically classified as the "Third World" Ocean. It is bordered by forty-two states, of which thirty-nine are involved in mining and capital exporting activities. This region includes major economies such as India, China, Japan, South Korea, and Singapore. In terms of energy security, approximately 65% of the world's daily oil production is transported via sea routes that rely on the Indian Ocean Region (IOR). The South Asian coastline measures around 11,000 nautical miles, while Maritime Sri Lanka encompasses an area of approximately 20,000 square nautical miles. Notably, 3.2 million square nautical miles, representing 83% of Sri Lanka's Exclusive Economic Zone (SLEZ), is located within the strategically significant Central Indian Ocean, which is the only mid-ocean area of its kind^[8]. These measurements should be contrasted with inter-port distances and great circle distances, as Geographic Information Systems (GIS) theory has been utilized to estimate the likelihood of containerized freight movement between ports.

For bulk carriers navigating from the Arab and Persian Gulf, it is crucial to maintain a significant distance from Sri Lanka's southern coastline, as few carriers can safely approach. The journey of these vessels heavily influences their access to Arabian and Gulf ports. Notably, port statistics from Sri Lanka diverge from the World Bank's projections up to 2010, particularly observing a sharp decline during the civil war in 1995 for one year. However, following the civil war's conclusion, there has been an impressive resurgence. In the financial year 2017, ship arrivals surged, with an increase of 3,815 vessels compared to 2016. Sri Lanka possesses the potential to generate over US \$1 billion annually from maritime activities, a significant contribution given the national budget ranges between US \$10-12 billion. Additionally, the country wields substantial influence in critical international organizations, including the International Maritime Organization, World

Bank, World Trade Organization, United Nations Convention on the Law of the Sea (UNCLOS), and the Indian Ocean Rim-Association for Regional Cooperation (IOR-ARC). Nonetheless, political instability and ongoing conflicts pose challenges to fully realizing this potential, despite the upward trajectory currently being observed.

Infrastructure development and connectivity

The challenges and opportunities inherent in the Indian Ocean's trade infrastructure are crucial for fostering trade integration. In this framework, the significance of ports and shipping infrastructure in enhancing trade, particularly within the South Asian region, cannot be overstated. In 2012 alone, there were over 8.6 billion passenger journeys, underscoring the historical importance of ferries and smaller vessels as early facilitators of global trade, with container ships now serving as the backbone of modern cargo transport.

Even in developed regions like Western Europe, exemplified by Belgium, which boasts a 69-mile coastline and a less than 1,000-mile maritime route to the UK, the presence of four major ports Antwerp, Brugge, Gent, and Zeebrugge highlights the strategic role of ports in trade. Comparatively, the United States, with its extensive 12,383-mile coastline, supports hundreds of deep-draft commercial ports^[9]. As it stands, sea freight outpaces all other modes of goods transportation in volume. In this context, it is imperative for policymakers to prioritize investment and development in ports, shipping infrastructure, and interconnected land transportation networks in order to bolster trade in the Indian Ocean and South Asian regions.

The ocean's contribution to global trade has undeniably surged since the early 1950s, driven by the explosive growth in business logistics. Today, Asia is not just a participant but a powerhouse of global economic expansion, playing a crucial role in the shipping industry and oil transportation. The recent conference in Malaysia, themed "Harnessing the South Asian Potential through a Prosperity Alliance," solidifies the fact that investing in physical infrastructure to facilitate trade is paramount on the regional policy agenda. Utilizing a rigorous cross-sectional gravity model and constructing an alternative panel dataset, bolstered by insights from the United Nations Review of Maritime Transport, we clearly demonstrate how ports and transportation infrastructure significantly influence trade dynamics in 2000, outlining decisive implications for enhancing trade in the future.

Ports are the heartbeat of maritime networks that drive global trade and commerce, serving as crucial transition points for goods moving between sea and land transportation. These pivotal hubs are indispensable for strengthening the industrial economy, boosting agricultural productivity, and fostering effective governance. Ensuring that both physical and ICT-based infrastructure within ports enables seamless freight movement and efficient storage solutions is essential for modern commerce. To meet rising demands, port communities across the globe are making substantial investments to modernize their infrastructure, incorporating state-of-the-art technology and advanced facilities to maximize intermodal transportation efficiency. The outdated transshipment model, which routes goods through nearby ports, has shown to be increasingly costly and slow. Consequently, leading global ports are actively expanding and upgrading their infrastructure and IT systems

^[10]. This transformation is vital for accommodating larger vessels, which require deeper berths and enhanced operational capabilities to meet the challenges of today's dynamic logistics environment.

A series of transformative infrastructure development projects are underway in the region aimed at revolutionizing supply chains, shipping, and logistics operations. These initiatives will effectively reduce transport costs, mitigate supply chain risks, and enhance trade flows. By leveraging advanced computing and cutting-edge supply chain technologies, India is set to redefine its role as a global supply chain hub. The expansion of Indian ports will significantly influence international trade routes, with a greater proportion of East-West trade shifting through the Strait of Malacca and an increasing percentage of Indian exports traversing the Cape of Good Hope. The logistical advantages offered by the Strait of Malacca, combined with the efficiency of intermodal transportation, will undoubtedly reshape global trade patterns in the Indian Ocean. Furthermore, the vast capacity of the Malacca Strait is poised to attract global fuel shippers, especially those from the Gulf markets, prompting a shift from the Suez Canal to this strategic maritime route. Transportation networks, which exemplify soft connectivity, play a vital role in facilitating trade connectivity. Efficient and sustainable transportation systems can bridge the gap between exporters and importers by linking production and consumption centres for goods and services. In this way, they can connect developed, developing, and least developed countries through economic corridors, promoting places, products, and people, and potentially positioning the region as a key store, hub, and corridor in the global economy. However, the successful development of transportation infrastructure will require the support and collaboration of the private sector and other stakeholders from the participating IORA Member Countries.

Soft connectivity is a vital mechanism that can immediately enhance the flow of goods and services, promoting inclusivity across regions. By significantly improving soft connectivity, we can establish efficient links between production and consumption centres, driving the momentum needed for enhanced trade and commerce. Unfortunately, many areas within IORA suffer from outdated, deteriorating, or insufficient transportation infrastructure. This shortfall has resulted in below-average connectivity levels. The number of container ports serving production zones is also less than the national average, which reflects negatively in the logistics performance index^[11]. To address these challenges, it is critical for the region to invest in upgrading the quality and adequacy of transportation infrastructure, especially to accommodate landlocked facilities. Focused efforts are required to enhance rail and road transport connectivity. By optimising existing roads, bridges, and rail networks, we can better match intra-regional trade flows. If strategic transportation links are developed under the BIMSTEC and SASEC frameworks, they could serve as powerful tools for facilitating trade and investment, particularly for transshipment and corridor development.

Technological innovations and digitalization in trade

Technological advancements constitute a pivotal element in enhancing the efficiency and cost-effectiveness of the shipping and port sectors. In the foreseeable future, it is

anticipated that no other industry can achieve such improvements without a considerable escalation in technological integration, physical automation, and robotic systems. Notable examples, such as the Jawaharlal Nehru Port Trust (JNPT) and the Sri Lanka Ports Authority's Regional Container Freight Station (RCFS) in Colombo, exemplify this trend. The velocity of vessel and container movement has reached a level that cannot be effectively managed through conventional systems that lack sophisticated automation. Furthermore, the focus of port development is shifting away from mere physical construction to optimizing existing facilities. In instances where immediate infrastructural expansion is unfeasible, the establishment of dry ports is emerging as a viable solution and is currently being implemented with considerable efficacy. Moreover, various operational tasks at ports are now being decentralized, allowing for functionality that can be managed remotely from the traditional port environments. The future landscape of port operations is poised to be significantly shaped by automation, digitalization, enhanced communication, integration, networking, and the overarching paradigm of e-commerce. Additionally, blockchain technology, originally developed for cryptocurrency and digital record-keeping, is increasingly being adopted within global international trade, further underscoring the necessity for advanced technological adoption in this sector^[12].

The consolidation of import and export data stands to significantly improve transparency, diminish the likelihood of document forgery, and enhance operational efficiency. In Bangladesh, the Bangladesh Road Transport Corporation (BRTC) has made commendable strides towards centralizing transportation documentation related to export and import activities. This initiative has received prompt endorsement from the Bay of Bengal Furnishing Zone Authority (BAFZA). Through the implementation of a Point-to-Point (P2P) system, key stakeholders will be able to electronically share information with relevant border agencies, including the National Board of Revenue (NBR), Bangladesh Customs, Immigration, the Bangladesh Inland Water Transport Authority (BIWTA), Chittagong Dockyard, and various banks and insurance companies. Such interconnectedness promises to foster improved coordination, facilitate a more favourable business environment, and enhance regulatory compliance within port operations and the surrounding areas. Moreover, the systematic exchange of information will empower various participants including consignees, Inland Container Depots (ICD), Customs authorities, shipping lines, cargo handling operators, clearing and forwarding agents, and end-users to better organize their schedules and prepare the necessary documentation prior to the arrival of cargo in Bangladesh. Ultimately, centralizing this critical information into a single, accessible online platform will streamline processes and elevate the overall effectiveness of trade operations in the region.

The automation of trade operations is conceptualized as the integration of sophisticated technological mechanisms and management strategies, encompassing the digitization of cargo monitoring systems, strategic planning for vessel berthing, e-commerce functions, electronic customs declarations, regulatory compliance, and the mechanization of port activities. The application of robotic technology introduces machines or computerized devices designed to

assist in various complex logistical processes, including the storage, transportation, and arrangement of packages arriving at warehouses. The seamless transit of goods from producers to consumers can be significantly enhanced by deploying robotic technology within logistics service frameworks. For an economy to improve its trade operations, it is imperative to optimize these technological advancements to ensure an uninterrupted flow of goods and services, thereby augmenting trade efficiency and promoting cost-effective operational practices^[13].

The optimization of various technologies has the potential to significantly enhance trade relations among the member nations of the Indian Ocean Rim Association (IORA). By effectively leveraging these technological advancements, countries can foster a more robust intra-regional trade environment while also improving labour efficiency in sectors such as resin processing and routine administrative operations. Collaboration among these nations stands to benefit their industrial and commercial sectors, promoting greater integration. Furthermore, the enhancement of handling times across diverse industries can be achieved by analysing data on short-handling trades, particularly in the realms of online commerce and natural products. This technology-driven approach to trade can lead to substantial improvements in time management, operational efficiency, and consistency. Such collaboration and synergy are imperative for all participating countries, regardless of their differing levels of expertise and economic resources, to fully realize the potential of their trade capabilities.

Trade transactions often face significant challenges due to isolated systems that lack interoperability among agencies concerning permits, visas, and tariffs. Blockchain technology has the potential to effectively bridge these gaps by breaking down these persistent barriers. By reducing the need for physical copies of bank guarantees and invoices, we can streamline processes significantly^[14]. Furthermore, blockchain can transform trade finance by utilizing decentralized finance mechanisms, thus minimizing cumbersome paperwork. In addition, blockchain will have a major impact on supply chain management, allowing entrepreneurs to easily identify sub-variants of their hardware and material components more efficiently. Notably, India is actively refining its e-commerce strategy, spearheaded by the Ministry of Finance and Niti Aayog. A key area of focus is the establishment of a new framework for technology-driven logistics service companies (LSPs) to enhance their operations within the domestic e-commerce delivery networks.

Blockchain technology offers robust data security due to the challenging nature of altering information within its framework. The validation of transactions and data verification has extensive applicability that extends beyond merely derivative trading. Recently, an Indian oil company is reported to have launched an initiative utilizing blockchain for solar energy trading, focusing initially on peer-to-peer electricity exchanges. In addition to this initiative, there are numerous other areas within international trade where blockchain's application could yield significant benefits. The nascent adoption of blockchain among nations participating in Indian Ocean trade presents substantial growth opportunities in various domains such as trade finance, risk reduction, document management, security oversight, accessibility, computational processes, logistics operations, and

minimizing transaction delays. Consequently, this technology has the potential to enhance the transparency, safety, security, and trustworthiness of the trade ecosystem.

Human capital development and skills enhancement

Human capital is the cornerstone of all socio-economic development strategies. As the world of work evolves at an unprecedented pace, the new global economy demands a workforce armed with high-level professional, technical, and vocational skills. To thrive in this dynamic environment, knowledge workers must be equipped with innovative knowledge, diverse skills, and the right attributes and attitudes. In a nation like the Maldives, the population is not seen as a burden but as a valuable asset. The southern region, in particular, is positioned to harness the potential of skilled and semi-skilled professionals, transforming them into a key resource for growth. With a clear vision to develop this area into a vibrant free zone, the sectors of tourism, fisheries, energy, and information technology are set to become major employment drivers in the coming years. Our commitment to the Southern Region will focus on institutional development, the overhaul of policies and programs, capacity building, and skill enhancement—all aimed at aligning with knowledge-based sectors. Together, we will forge a participatory and sustainable economy that will benefit all citizens of the Maldives.

The South Asian region stands out as a significant hub for numerous higher education institutions and advanced training programs in Technical and Vocational Education and Training (TVET), particularly in education and management. These educational establishments have been instrumental in transferring technical expertise and equipping the workforce with essential skills, which are vital for the evolving job market. They typically focus on need-based, job-oriented courses primarily in sectors such as agriculture, tourism, fisheries, and cooperative management^[15]. However, many specialised courses that could address unique market needs remain underdeveloped.

As the Southern Region diversifies its job sectors, it has embraced various specializations that align with current technological advancements. This shift is bolstered by an increasing demand for experienced professionals in development activities, particularly those capable of making strategic decisions in complex projects and programs. The rapid changes in trade and the evolving demands of the training sector highlight the necessity for world-class courses that provide exceptional hands-on training in various fields, particularly at the diploma level. From a trade perspective related to the Indian Ocean, there is significant potential for specialized programs that prepare human resources for engagement in trade and related sectors. The development of Colombo as a Port Hub under the Integrated Coastal Zone Management (ICZM) and Platform for Innovative Container Transportation (PICT) initiatives accentuates this need. Therefore, courses that focus on ship repair, marine fundamentals, container cargo handling techniques such as operating JCBs, cranes, and forklifts, as well as marketing strategies for tourism and shipping in connection with the Maldives, could serve as viable educational options. Additionally, to attract talent from the southern regions, it is crucial to enhance hostel facilities at major educational institutions. This improvement can create a more appealing environment for potential students, further strengthening the local education and training landscape.

Heritage exchanges and cultural connectivity offer

invaluable opportunities to foster trust and strengthen connections among people and nations in today's competitive global landscape. By promoting heritage exchanges throughout the South Asian Ocean, we can create a reliable and inviting destination in the Indian Ocean. The effective heritage management of tourist sites in this region is inherently linked to the broader trading environment in which they exist. Leveraging soft power and diplomacy can enhance power dynamics within South Asia while garnering support from major players in the Indian Ocean region. This approach nurtures a foundation of trust, enriches our shared heritage, and bolsters local economies. We can achieve this by encouraging meaningful exchanges that resonate with local cultures, practising generosity through gifts, embracing spirituality and rituals, and fostering deep-seated faith in global connectivity prioritising holistic choices over mere power dynamics^[16].

Trading practices and cultural values are vital to establishing successful livelihoods. They create a dependable framework for people to engage meaningfully, allowing for a relaxed atmosphere conducive to essential activities like negotiation and trust-building. By fostering interactions grounded in mutual respect and goodwill, these practices minimise fear and encourage open communication. They also enhance confidence, empowering individuals to reach out autonomously while aiding in the identification of deceitful actors through recognizable signs of legitimacy. These insights highlight the importance of exchange as a fundamental mechanism, suggesting that trading is pivotal in addressing numerous critical challenges faced by contemporary society rather than being merely a secondary activity. This framework points to the possibility of distinct voices and governance structures that have the capacity to either support or contest the prevailing power dynamics in the region, all while navigating the intricate landscape of diplomacy. Furthermore, the notion of the Indian summer is a compelling metaphor for cultivating enduring, peaceful trading relationships against the backdrop of significant diversity and varying power relations.

Results and Discussions

Research on Indian Ocean trade dynamics uncovers several critical insights that could significantly drive economic growth in the South Asian region. Among the most noteworthy findings is the enhanced maritime connectivity resulting from newly established shipping routes and upgraded port infrastructures. These advancements are allowing South Asian nations to lower transportation costs and streamline supply chain operations, which in turn cultivates more robust trade relationships.

The diversification of trade partners beyond traditional markets is notable, with South Asian economies increasingly engaging with African and Middle Eastern regions. This expansion of economic relationships not only reduces dependence on specific countries but also unveils new opportunities for trade and investment. Additionally, the rise of secondary ports as essential economic hubs underscores their significance as key nodes in the Indian Ocean trade network, attracting foreign investments and fostering regional economic integration.

A crucial discovery highlights the transformative power of digital trade. The adoption of digital platforms in trade operations has revolutionised trade facilitation, empowering even the smallest businesses to engage in global commerce

through e-commerce and advanced digital payment systems. Furthermore, there is a rising focus on sustainable practices within maritime trade. Numerous South Asian nations are embracing eco-friendly strategies in their shipping and port operations, which not only align with global sustainability goals but also enhance their international standing. Additionally, the geopolitical landscape significantly influences the dynamics of trade in the Indian Ocean region. Regional tensions and alliances have the potential to significantly impact trade routes and economic policies, underscoring the necessity for countries to implement robust trading strategies. Furthermore, the research underscores the critical role of human capital development, highlighting the importance of investing in skills training and education in logistics and maritime management to fully capitalise on the advantages of trade.

The insights from this research provide essential policy recommendations designed to strengthen trade frameworks and optimise regulatory landscapes while encouraging collaboration among South Asian countries. Such initiatives are vital for gaining a competitive advantage in the global marketplace. The promise of significant economic growth spurred by Indian Ocean trade is clear, with nations in the region positioned to attain higher GDP growth rates and enhance their economic resilience overall.

The significance of trade in facilitating cultural exchange and enhancing soft power among South Asian countries is noteworthy. Increased understanding and cooperation through trade relationships can lead to enduring economic connections and contribute to regional stability. The findings of this research indicate that leveraging the complexities of Indian Ocean trade presents considerable opportunities for economic progress in South Asia.

Conclusion

After a thorough examination of the challenges facing trade in the Indian Ocean and an exploration of the potential opportunities that policymakers and entrepreneurs in the region can leverage to enhance their trade objectives, we now put forth the following policy recommendations for consideration and discourse. These recommendations are categorized into those aimed at regional stakeholders and those targeting extra-regional or international entities. The dynamics of Indian Ocean trade are influenced by various drivers, challenges, and opportunities, but these factors do not all impact the region equally or influence the stakeholders involved in trade in the same way. To drive meaningful change in the political and economic landscape of trade, it is essential to gain a deeper understanding of these factors and their specific implications. Historically, trade inequalities both in terms of the actual flow of goods and the level of participation among different stakeholders have significantly shaped the formulation of trade policies. This pattern persists today, indicating that addressing these disparities is crucial for developing more equitable and effective trade frameworks. Analysing these elements in detail will help identify ways to harness their potential and improve the overall trading environment in the region.

The Indian Ocean plays a crucial role as a pivotal hub for global trade, characterized by significant exchanges of goods and services. It serves not only as a vital conduit for trade but also as a complex arena for trade policymaking that engages multiple levels of authority, ranging from international and supranational bodies to national

governments and local entities. This multifaceted involvement of various stakeholders creates a landscape of intense competition and negotiation over trade regulations. Consequently, the Indian Ocean emerges as a dynamic platform for regulatory innovation that operates on several tiers. This innovative potential not only has the capacity to disrupt existing trade policies but also to influence the broader landscape of trade governance, shaping practices and frameworks both within the region and on a global scale. Addressing the challenges associated with trade ordering in this context necessitates a regional approach that recognizes the unique complexities of the Indian Ocean, rather than relying solely on bilateral solutions.

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