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Examining the Maritime–Economy Nexus: A Systematic Review of Shipping and Port Contributions in South Africa

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Abstract:

South Africa's maritime sector plays a pivotal role in connecting the nation to global trade networks and fostering economic development. This study systematically reviews existing literature to examine the maritime–economy nexus, focusing on how shipping and port activities contribute to South Africa's economic growth and job creation. Drawing on government reports, policy documents, and peer-reviewed studies, the research identifies key pathways through which maritime operations enhance national output, employment, and trade competitiveness. The findings reveal that efficient port infrastructure, increased participation in international shipping, and strategic initiatives such as Operation Phakisa can substantially expand South Africa's economic base. However, persistent challenges— including infrastructural inefficiencies, limited investment, and skills shortages—continue to constrain the sector's full potential. The study concludes that leveraging technological innovation, strengthening maritime policy implementation, and promoting human capital development are critical for ensuring that shipping and port activities effectively drive inclusive and sustainable economic growth in South Africa.

Keywords:

Maritime, Economic Growth, Job Creation, South Africa, Systematic Review

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Introduction

The transportation system is a key contributor to competitiveness in global markets. It can be considered as the critical engine for social and economic growth. The South African government spends vast amounts to improve its transportation system, aiming to maximise revenues from the shipment of goods. According to Mlambo (2021), shipping is crucial for the global economy, enabling economic trade between continents. Economic theory often emphasises the significance of ports as catalysts for economic development, particularly in historical contexts where they have been instrumental in promoting commerce and enhancing the well-being of nations (Ayhan, 2023; Khan & Emon, 2024). It is essential to recognise that a seaport is not a final destination; its activities significantly contribute to the industrial and logistical development in both the port areas and their hinterlands (Notteboom, Pallis, and Rodrigue, 2022). Thus, ports serve as vital hubs for global trade and transport. Only a limited number of studies have attempted to assess the influence of port performance on trade. It is, therefore, helpful to look at the impact of port operations on African trade. Few comparable studies have been conducted on the African continent. This research explicitly expands the understanding of maritime transport and trade within this context. Shipping is considered the most efficient, safe, and environmentally friendly means of transporting goods globally. While maritime transport's direct contribution to the national economy is minimal, port operations, cargo, and related maritime services are crucial for assessing growth and employment prospects in South Africa's maritime industry (Department of Transport, 2011).

This study aims to analyse how shipping and port operations contribute to the growth of the South African economy, with a particular focus on creating jobs in the shipping sector. More specifically, this paper aims to understand the extent of South Africa's participation in the shipping industry, to examine the maritime sector's direct and indirect contributions to job creation, and to investigate the correlation between South Africa's port volumes and economic growth.

Method

This study will adopt an exploratory research design, allowing the researcher to analyse data without constraints and develop theories based on the collected information (Sekaran & Bougie, 2016). We employed desktop research strategies to gain a deeper understanding of current policy and commercial requirements. This research method identifies data gaps, necessitating a deeper grasp of how the study might add to a broader body of knowledge (Berkovich & Quantity, 2016). The review followed a structured and transparent process, consisting of a defined search strategy, a screening and selection procedure, and a qualitative synthesis of the selected studies.

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Data Collection

Secondary data is to be collected to conduct exploratory research. The first step will be identifying the industry-specific journals, white papers, and research articles for past research. Additionally, the appraisal of pertinent studies informed the methodology and approach adopted in this research endeavour. The second step will be to collect data from the web portals of industry-specific shipping company associations to track industry growth, trends in demand for specific products, and yearly changes in demand, which can indicate how customer preferences are evolving. The third step involves government websites that provide industry-specific data, such as growth, market trends, competition, and other key industry metrics, as well as the outcomes of government-sponsored research. It will also give some important insights into the maritime industry. The fourth step will be to research some credible websites relevant to the shipping industry, follow the changing nature of demand, and identify the trends. Data collection is the process of methodically obtaining and analysing data on variables of interest to meet specific research goals, test hypotheses, and evaluate outcomes (Kapur, 2018). Data collection can be used to accomplish a variety of tasks, including but not limited to research exploration, problem-solving, decision-making support, performance evaluation, monitoring trends and patterns, benchmarking, predictive modelling, policy formulation, customer feedback, quality assurance, educational assessment, market research, healthcare planning, and performance measurement. This procedure takes place while the data are being collected. The credibility of the collected data was secured by choosing the suitable data collection technique and ensuring that the data gathered addressed the subject matter that was meant to be the focus of the study. In other words, the credibility of the obtained data was assured. The authors gathered relevant information from various sources, such as articles, journals, prior theses, and textbooks, and then organised it all with the help of the educational search engine Google Scholar. The authors selected the articles based on a wide range of criteria, some of which were all-encompassing and others more narrowly focused. When choosing the final articles, the researcher used the following standards to determine which ones to include and which ones to leave out: Shipping and port activity serve as essential growth drivers for South Africa's economy. The following criteria were used in order to select articles that are pertinent to the topic at hand. The inclusion criteria were based on reputable scientific publications, the full texts of the relevant articles, and reports relevant to the research's subject matter. Additionally, every article had to be written in English and published. As potential sources, the researcher disregarded information from non-academic papers on the subject, published articles that required payment, articles that needed to be connected to the research subject, and items that needed to be written in English. Table 1 outlines the specific criteria used to select articles relevant to the topic at hand. The inclusion criteria were based on reputable scientific publications, ensuring the selected articles provided rigorous and credible insights into the subject matter.

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Search words	**Text Limited To:**
Shipping Ports and Economic Growth	Full Text and Scholarly Articles
Shipping Ports and Economic Growth in South Africa	Full Text and Scholarly Articles
Benefits of Shipping and Ports	Full Text and Scholarly Articles
South Africa's Shipping Industry	Full Text and Scholarly Articles
Maritime Sector and Job Creation	Full Text and Scholarly Articles

Table 1: Criteria for selecting articles that are pertinent to the topic at hand

Data Analysis

Relevant information was extracted from the final set of selected studies, including study objectives, methodological approaches, key findings, and policy implications. The analysis employed qualitative inductive content analysis, allowing dominant themes and patterns to emerge from the literature. These themes were synthesised to identify the main pathways through which shipping and port activities contribute to economic growth, job creation, and trade performance in South Africa. Table 2 provides a summary of key findings from the systematic literature review.

Themes	**Key Evidence from Reviewed Literature**	**Implications for South Africa**
Shipping participation and economic growth	Increased trade integration, port competitiveness, Operation Phakisa outcomes	Enhanced GDP contribution and trade performance
Maritime sector and job creation	Direct and indirect employment across shipping, ports, tourism, manufacturing	Employment growth with skills development needs
Port volumes and economic growth	Higher cargo throughput linked to trade expansion	Importance of port efficiency and infrastructure investment

Table 2: Summary of key findings from the systematic review

The qualitative method analysis was applied within the constraints of this inquiry. In contrast, the inductive content analysis was based on data gathering using Google Scholar query phrases. In qualitative research, the investigator's goal is to get as much information as possible, which may include a comprehensive description of the topic under investigation. Additionally, it offered support for the conclusions drawn from the study. This is not to imply that people's viewpoints are correct; instead, it is to assert that the results correctly depict people's perceptions in whatever form those perceptions may take. This is not to imply that people's opinions are valid. These publications comprehensively analyse

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the correlation between "Shipping and Ports" and "Economic Growth," addressing the question raised within the research context. These articles share many similarities in characterising the positive contributions of shipping and ports to economic growth. Flick (2015) devised a method that integrated data analysis with theoretical grounds to clarify the findings and make them more straightforward to comprehend.

Results and Discussion

South Africa's Participation in the Shipping Industry Promotes Economic Growth

The Department of Transport, as stated in its "Revised Strategic Plan 2020 –2025," highlights the potential of South Africa's Ocean economy and shipping industry to contribute approximately R177 billion to the national GDP (Department of Transport, 2022). South Africa accounts for about three-point-five percent (3.5%) of ocean trading and eighty percent (80%) of the global trading value. The shipping industry must, however, accelerate the comprehensive maritime transport policy and its application toward the 2030 targets. Increased participation of the shipping industry in International Maritime Platforms such as the 2023 Rio competitions and the establishment of the Maritime Development Fund and Maritime Oceans Economy Programme will open fresh markets for cargo movements as well as create and maintain the port's ability to support trading in the ports (Department of Transport, 2022). In its *"2020/21 annual performance plan and 2019/20-2023/24 strategic plan,"* the Department of Forestry, Fisheries and the environment indicates that South Africa prevails in the top fifteen (15) nations with a viable ocean economy business (Department of Forestry, Fisheries, and the Environment, 2022). South Africa's participation in the shipping industry will increase partnerships and promote economic growth. According to the plans, global partnerships with the stakeholders and departments, including the Department of Environmental Affairs and the Department of Transport, will improve South Africa's ocean economy and high concentration in a) offshore gas and oil exploration, b) manufacturing and marine transport undertakings like coastal shipping, boat building, trans-shipment, refurbishment and repair, c) aquaculture, as well as, d) services like ocean governance and marine protection (Department of Forestry, Fisheries and the Environment, 2022).

South Africa's Ocean economy strategy, *"Operation Phakisa,"* reports that South Africa's maritime industry can substantially exceed its present one-point-two percent (1.2%) GDP contributions. Participation in the shipping industry is likely to contribute approximately R177 billion to the gross domestic product (GDP) (South African Government, 2022). South Africa's participation in the shipping industry addresses historical monopolies and improves the effectiveness of port operations, infrastructure, and competitiveness. Better policy harmonisation and economic regulations enable

improved ship registration, ownership, and the execution of the African Continental Free Trade Area (AfCFTA) (South African Government, 2022). In the article *"Operation Phakisa: Unlocking the Economic Potential of South Africa's Oceans,"* the Department of Planning, Monitoring and Evaluation finds that South Africa's participation in the shipping industry will create an attractive market wherein regulation defines the products and goods and their movement by sea (Department of Planning, Monitoring and Evaluation, 2021). To promote economic growth, the government has identified forty-seven (47) initiatives whose advanced undertaking will secure around six percent (6%) of Government Cargo and increase the GDP contribution of the ocean's economy by about R20 million every year (Department of Planning Monitoring and Evaluation, 2021).

The World Bank's *"Container Port Performance Index 2021"* indicates that while South Africa's ports dominate regional trade, that is, seventy-six percent (76%) of the containerised traffic in Africa's sub-Saharan region, all the national container ports like Durban, Ngqura, and Gqeberha have low ranking in global container port performance. Currently, cargo ships wait almost two weeks to berth (World Bank, 2021). The World Bank reports indicate that South Africa's participation in the shipping industry will increase the number of containers moving through national ports and handling freight, currently at around two million twenty-foot equivalent units (TEUs) annually, which Durban handles. Increased participation in the shipping industry will improve efficiencies by enabling South Africa to remove Transnet's monopoly over freight services and railway infrastructure (World Bank, 2021).

Karani and Failler (2020) indicate in their article *"Comparative coastal and marine tourism, climate change, and the blue economy in African Large Marine Ecosystems"* that besides increased private investment, reinvestment of the port proceeds into the port infrastructure as well as the establishment of the Transnet National Ports Authority as a separate company, South Africa's participation in the shipping industry can give push eco-tourism. South Africa can use participation in the shipping industry to market its vast fauna and flora biodiversity, which is rare in other parts of the world. Participation in the shipping industry enables the nation to draw several eco-tourists into the nation's shores, expansive coastline, sandy beaches, and vast eco-tourism events like whale watching, snorkelling, surfing, shark diving, game fishing, and scuba diving (Karani & Failler, 2020). South African authorities can use participation in the shipping industry to market and re-position South Africa as a desired tourist destination.

Bond (2019) studied *"Blue Economy threats, contradictions, and resistances seen from South Africa"* and found that South Africa's participation in the shipping industry helps the national and provisional governments to intensify the identification of fossil fuels, offshore gas, and oil as an area and measure for fast economic development. As a result of participating in the shipping industry and promoting economic growth, the South African government is ramping up efforts to explore rich natural gas sources

off the south coast of the Cape by accelerating the drilling of thirty wells as part of its Operation Phakisa strategy. Infrastructure development, such as the gas pipeline network, is also being pursued to further bolster South Africa's gas economy. In *"South Africa gas discovery could revive energy sector,"* Oxford Analytica (2019) finds that South Africa has about a billion barrels of the world's total condensate and gas resources. Participation in the shipping industry and the discovery of gas deposits are key and potential boosts for the slow national economy, which has grown below one percent (1%) since 2019. The abundance of renewable energy means the nation and global shipping industry can derive fuels from South Africa's renewable electricity generation. For instance, companies operating commercial vessels, such as bulk carriers, tankers, and containers, can purchase ammonia and hydrogen. In contrast, small vessels, such as port service vessels, will procure onboard and direct electrification from South Africa (Ayuk, 2021). In its article titled *"South Africa: Fuelling the future of shipping; South Africa's role in the transformation of global shipping through green hydrogen-derived fuels,"* the Global Maritime Forum (2022) finds that South Africa can create fresh export markets, zero carbon fuels as well as the development of a national hydrogen economy by capitalising on participation in the shipping industry, the brilliant renewable ability and drive to decarbonising shipping. Participation will allow the nation to develop sustainable supply chains, register a new sustainable industry, and attract external investments and global funding. In addition to presenting opportunities for the growth of domestic enterprises, expertise, and skills, there is a significant opportunity to attract investment of between R35 billion and R49 billion by 2030. Participation in the shipping industry enables South Africa to capitalise on the exceptional renewable capacity to develop supply chains (Global Maritime Forum, 2022). The nation will position itself as a zero-carbon bunkering hub in the new domain of decarbonised shipping. Odeku's (2021) article titled "*Operation Phakisa to Unlock the Potential of Ocean Resources in South Africa*" suggests that engaging in the shipping industry and oceans economy offers South Africa an opportunity to enhance the management of dry docks, shipyards, marine repair enterprises, and shops. According to Operation Phakisa, South Africa has neglected the shipping industry, despite its vast potential to create a flourishing ecosystem where entrepreneurs can incubate and mature. The shipping industry offers South Africa Small harbours and low-hanging fruits, which can hasten enterprise progress and inspire economic development (Odeku, 2021). In *"South Africa's Operation Phakisa: Development without security?"* Otto (2019) contends that the shipping industry offers participating nations like South Africa commercial undertakings and seaport infrastructure that a) supports fish processing, production of ice and cold storage; b) boat-repair and building; c) supplementary launching and berthing facilities; d) advanced points of recreational fishing; e) increased access to improved amenities for the fishers; and increased global market expansion as well as logistical performances in commerce.

Konstantinus, Zuidgeest, Christodoulou, Raza, and Woxenius (2019) studied the *"Barriers and enablers for short sea shipping in the Southern African Development Community"*. They concluded that investing

in the shipping industry and developing successful infrastructure would enable South Africa to lower transportation costs and increase trade volumes. South Africa's participation in the shipping industry will prompt it to enhance its government infrastructure and transportation services, thereby reducing time and transportation costs. Better infrastructure means lower transportation costs. Increased participation in the international shipping industry boosts South Africa's chances for economic growth, labour demand, and supply (Konstantinus et al., 2019). The advantages of increased investment in shipping infrastructure are reduced trip times, technological diffusion, and better freight services. South Africa's ability to increase infrastructure investment and engage with the global shipping world defines its competitiveness and the quality of the services delivered. Resultantly, participation in the shipping industry will compel the government to invest significantly in seaport structures like port technologies and additional ports because the more cargo the port handles, the better the provision of quality logistics and services as well as the fulfilment of the international supply chain and rising demand (Konstantinus et al., 2019). Maphatsoe (2021) studied the *"Potential growth for S African shipping sector"* and found that of the over 14000 ships transiting in South Africa every month, almost 500 source their essential services airfreighted or locally, mainly in Durban, Gqeberha, and Cape Town. South Africa is the global hub for changing crews and a favourite stopover for refilling provisions, spares, bunkering, medical retreats, and other services. Many ship proprietors prefer off-port limits (OPL) services to save costs. The country's decent positioning on the maritime trading route provides better access to key international ports, medical facilities, and destinations, making it a good hub for OPL services and crew changes (Maphatsoe, 2021).

In *"Collaborative action sees OPL services continued during the lockdown,"* the Maritime Review Africa (2020) insists that the South African government needs to create vast ramp-ups in the ships utilising the unique services because each transaction that happens in support of the shipping industry is financed in United States dollars. Since the shipping industry has institutional knowledge, experience, and capability to deliver professional and reliable services, the government can maintain its infrastructure to sustain demand. Ramping up services and facilities to the ships and vessels passing the coast of South Africa to almost ten percent (10%) of the overall passing traffic will guarantee a $10000 minimum expenditure for every serviced ship (Maphatsoe, 2021). Maphatsoe (2021) further emphasises that South Africa's involvement in the shipping industry contributes to economic growth, noting that merchant ships travelling along the west or east trading routes opt not to use the Suez Canal, instead passing through South African ports within a 20-mile route. This allows South Africa to emerge as a pivotal service centre in global shipping and trading routes. The nation can meet the ships halfway through each voyage, as it is positioned perfectly to service ships from North America, Australia, and the Far East, passing around Africa. Ships transiting around Africa from the Middle East to Europe or West Africa have a cost-effective option in South Africa for their vital air-freighted spare parts, victualling, and crew

change needs (Maphatsoe, 2021). The taxes exclusively paid by end-users make South Africa's participation in the shipping industry a treasured asset to economic growth. The nation will meet every ship with specific requirements, and each supplied item will have tangible benefits for South Africa's financial growth, increasing its share of the total market from the current five per cent (5%) to approximately ten per cent (10%) (Maphatsoe, 2021). Participants will conservatively supply R2.5 billion every year to the nation's value chain.

Matekenya and Ncwadi (2022) contend in their article, "The impact of maritime transport financing on total trade in South Africa," that South Africa's participation in the shipping industry increases commerce and lowers trading costs, such as transport, customs, cargo delivery, and other uncertainties. Even though South Africa's specialisation in global commerce stems from supplying improved city infrastructure and resource endowments, increased participation and investment in the shipping industry offer the nation a comparative and absolute advantage over competitors in terms of overall factor efficiencies (Matekenya and Ncwadi, 2022).

Notteboom, Pallis, and Rodrigue (2021) studied *"Disruptions and resilience in global container shipping and ports: the COVID-19 pandemic versus the 2008–2009 financial crisis"* and found that improved port infrastructure due to participating in the shipping industry facilitates export progress and boosts the inside commercial environment. Participation improves port competitiveness, service quality, regional connections, accessibility, and hinterland conditions. In their article "*Liner Shipping Bilateral Connectivity and its impact on South Africa's bilateral trade flows* ," Hoffmann, Saeed, and Sodal (2020) conclude that favourable government initiatives, adequate investment, information systems, and operations help South Africa's maritime sector accomplish sustained competitiveness, and maritime trading from participating in the shipping industry compared to other Southern African Development Community (SADC) members. Therefore, South Africa's participation in the shipping industry has led to improved factor mobility and trade flow, as well as high interdependence.

Overall, the reviewed literature consistently indicates that South Africa's participation in the shipping industry plays a strategic role in supporting economic growth by enhancing trade connectivity, port competitiveness, and integration into global maritime networks. Government initiatives such as Operation Phakisa, combined with increased investment in port infrastructure and maritime services, are identified as key enablers of economic expansion. However, the findings also highlight that inefficiencies in port performance, regulatory constraints, and infrastructure bottlenecks continue to limit the sector's full growth potential. Collectively, these studies suggest that sustained policy coordination and operational reforms are critical for maximising the economic benefits of maritime participation.

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South Africa's Maritime Sector's Direct and Indirect Contribution to Job Creation

The South African Maritime Safety Authority (SAMSA) indicates in its *"Annual Performance Plan 2022/2023"* that the maritime sector can, directly and indirectly, contribute to job creation in its five (5) sub-sectors, that is, a) Ports and Ships (Marine Resources and Shipping), b) Marine Leisure and Tourism, c) Marine Construction and Manufacturing, d) Business Services and Commercial Support as well as) Public Interests. The Manufacturing and Construction subsector has a significant boat-building industry and a robust export sector, comprising about eighty-five percent (85%) of the production. The annual turnover of boat building is approximately 4,500 jobs and R1.2 billion. The target for SAMSA in 2022 is 60 Jobs for Women and Youth in the maritime industry (SAMSA, 2022). The continuous expansion of the ports sub-sector indicates a rising demand for individuals in maritime transport. Therefore, regardless of anticipated growth, addressing this immediate domestic demand requires strategies to fulfil the requirements of businesses associated with shipping. Operation Phakisa suggests that the oceans could generate over one million jobs by 2033. Marine transport and manufacturing contribute over 15000 direct and 45000 indirect jobs (South African Government, 2022). According to figures released by the government, the ocean economy has the potential to create 0.8–1.0 million jobs, which is more than double the level recorded in 2010. According to Statistics South Africa (2022), this initiative is expected to significantly reduce the persistently high unemployment rate, which reached 29% in the first quarter of the year. As a preferred and acknowledged shipbuilder for partner countries, constructing vessels for them would lead to continual job creation and skills development for an extended period. Therefore, the government has identified forty-seven (47) detailed initiatives, which will create about 22000 direct new jobs by 2023 (South African Government, 2022). The Department of Transport has generated nearly 200 employment opportunities by categorising the acquisition and upkeep of operational vessels under the Preferential Procurement Regulations governing public sector procurement. According to South Africa's Comprehensive Maritime Transport Policy (CMTP), the maritime sector alone can create about one million jobs in the following ten (10) years (Department of Transport, 2021). The ocean economy can contribute about R170 billion to the national GDP by 2033 compared to 2010's R54 billion. The government plans to create more opportunities in the maritime sector and 700,000 jobs. South Africa ratified the United Nations Convention on the Law of the Sea (LOSC) of 1982 to create and enhance sustainable and feasible chances for historically disadvantaged businesspersons, especially women. The Department of Transport (2021) emphasises the importance of extending the policy to empower and uplift previously economically excluded and socially repressed population clusters in South Africa. Yamkela (2020) analysed *"South Africa's governance perspective on the Indian Ocean Rim Association's (IORA) focus area on women's economic empowerment"* and found that the policy pushes for cabotage and exploitation of the coastal waters for equality in employment. The requirement in liberal cabotage is engaging 50% of the national crew, mainly where

negotiated or local employment rates apply similarly to the crew when the vessel is operating on the South African coast (Yamkela, 2020). Adjusting its cabotage and liberality degree and permitting a certain extent of external participation will allow South Africa to meet the industry's economic and social requirements, mainly job creation and employment. No other South African policy on the ocean economy has sufficiently linked women's empowerment and national development like the CMTP (Yamkela, 2020).

In the article *"The Economic Potential of the Ocean,"* Gqubule (2022) states that South Africa's Ocean economy employed 316000 people in 2010. Concrete programs to kick-start development in various sectors, partnerships, and increased collaboration amongst stakeholders from the public sector, business, labour, and civil society can help the maritime sector directly and indirectly contribute to job creation. In his State of the Nation Address 2019, President Cyril Ramaphosa provided an update: "Since the introduction of the ocean economy in 2014, South Africa has created over 7000 direct jobs." Increased partnerships, collaboration, and investment in skills development are causing accelerated job creation. According to Gqubule (2022), the government anticipates an investment of R3.8 billion in the ocean economy over the next five years, while the private sector is expected to contribute R65 billion. This combined investment is projected to generate over 100,000 direct jobs and more than 250,000 indirect jobs (Matekenya, 2022). The South African Government offers several incentives to strategic maritime industries to support job creation. For example, the Industrial Development Zones (IDZ) initiative offers affordable and effective logistical services through world-class infrastructure and close access to international ports. Investments in the existing IDZs have already created approximately 73000 jobs. At the same time, the Special Economic Zones (SEZs) offer powerful employment tax incentives, including a deduction of R36000 in additional training allowance per full-time employee from taxable income (South African Government, 2022). In 2010, coastal and marine tourism employed 90,000 people. By 2033, the sector could employ 150,000 to 225,000 people. The construction contributed to employing 162000 people and can employ 400000 people by 2033. Fisheries and aquaculture employed 30000 people in 2010, but can employ 200000 people by 2033.

In its discussion document *"Towards a South African Oceans Economy Master Plan,"* the Department of Forestry, Fisheries, and the Environment (DFFE) leverages South Africa's coastline and maritime to create employment. For the maritime sector to contribute to job creation, both directly and indirectly, South Africa will leverage its unique geographical location, enhance port efficiency, and promote improved marine transport and cargo handling. The master plan looks further into significant investment in coastline exploration and expanding the national offshore gas and oil industry. An increased focus on South Africa's fishing industry will help the maritime sector employ more than 60,000 people and will result in successful socio-economic contributions.

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In his 2022 address to the Comprehensive Maritime Transport Policy (CMTP) Mid-Term Review Conference, the then Minister of Transport, Fikile Mbalula, indicated that enhancing South Africa's ship registration framework will help the maritime sector, both directly and indirectly, contribute to job creation. Making a meaningful contribution to broadening economic participation, improving regulation, and creating captive markets for South Africans will give preference to South African vessels to move cargo between domestic ports, trigger merchant growth, and generate new industries (Mbalula, 2022). Skills development and exposure of young people to maritime in higher learning will enable them to assume careers in the maritime sector. Today, private companies and the government send scholars to International Maritime Organisation (IMO) institutions, such as the International Maritime Law Institute and the World Maritime University. The aim is to increase employment opportunities and grow South Africa's maritime industry. Skills training will sustainably unlock the maritime sector's potential to, directly and indirectly, contribute to job creation. The Transnet National Ports Authority (TNPA) indicates in its *"Maritime Transformation Legacy"* that upgrading ports will not only directly and indirectly contribute to job creation in South Africa's maritime sector, but also ensure efficient export and import (TNPA, 2022). The TNPA strategy is to develop and expand key ports, such as Durban and Ngqura, over the next ten-year period. While the Transnet group employs approximately 50,000 workers, increased investment in operations per functional portfolio over the next five years also means improved job creation (TNPA, 2022).

The Eastern Cape's "*Oceans Economy Master Plan*" aims to achieve the 5-year objectives of 10,870 and 33,785 jobs by 2022 and 2023, respectively (Nelson Mandela University, 2022). The plan highlights five (5) priorities that will reignite South Africa's progress in creating 3.4 million occupations if businesses and government prioritise them. There are fifty-nine maritime projects that, with increased government funding, have the potential to generate jobs by the year 2038. Mankewu (2022) states in his article *"The ocean economy is integral to the revival of the Eastern Cape's habitability"* that the successful implementation of the identified priorities will not only position South Africa better in achieving its long-held dream of the "rainbow country" characteristic of collective prosperity but also help its maritime sector to, directly and indirectly, contribute to job creation. The Eastern Cape government is changing its attitude towards implementing stimulus programs that generate shared prosperity and employment and boost its GDP per capita (Mankewu, 2022).

Automation integration in ports stands out as a transformative force in the evolving industry. Amidst the demands of a swiftly evolving global landscape, South African ports must embrace automation. The infusion of technologies such as the Internet of Things, Artificial Intelligence, and robotics has ushered in a new era of efficiency. Automated systems promise to revolutionise cargo handling, offering real-time insights and minimising shipping delays. This technological integration streamlines processes and positions South African ports as competitive players on the international stage. However, as the maritime

sector undergoes a technological transformation driven by the Fourth Industrial Revolution, it faces challenges. The automation that enhances efficiency and global competitiveness also has an adverse effect on job creation. Job displacement looms as tasks traditionally performed by human workers become automated. The shift in required skills poses challenges to the existing workforce, demanding reskilling initiatives to adapt to evolving technological landscapes. The impact of automation is not uniform across the workforce; low-skilled jobs face a disproportionate risk of being automated. Routine and repetitive tasks, once the domain of manual labour, are now susceptible to technological takeover. This raises concerns about job polarisation and highlights potential disparities in the labour market, exacerbating existing inequalities.

The evidence reviewed demonstrates that the maritime sector contributes to employment creation both directly, through shipping, port operations, and shipbuilding, and indirectly, through associated industries such as tourism, logistics, manufacturing, and energy. Policy frameworks, including the Comprehensive Maritime Transport Policy and Operation Phakisa, recognise the sector's capacity to generate large-scale employment, particularly for youth and historically disadvantaged groups. Nonetheless, the literature also raises concerns regarding skills shortages and the potential displacement of low-skilled labour due to automation. These findings underscore the importance of targeted skills development and inclusive labour strategies to ensure that maritime-led growth translates into sustainable job creation.

The Correlation Between South Africa's Port Volumes and Economic Growth

In the article *"7 Major Ports of South Africa,"* Sinha (2019) finds that South Africa has six (6) key commercial ports, including Richards Bay, Durban, Cape Town, East London, Saldanha Bay, and Port Elizabeth. In addition to the repair facilities and floating dry dock, the Durban port has two (2) coastal containers and five (5) deep-sea berths, providing commercial ships with 15195 meters of quayage. In contrast to Richards Bay, which accommodates bulk carriers of 250000 tons and has five (5) berths for coal, bulk, and general cargo, Cape Town has a large dry dock, five (5) berths for the general cargo vessels, and container carriers, a pier for the coastal traffic as well as comprehensive ship repair amenities (Sinha, 2019). Port Elizabeth has mechanical ore-handling plants processing 1500 tons every hour and precooling storage areas with a 7500 cubic meter capacity. Saldanha Bay has 5000 hectares of port area and an ore-loading jetty handling 350000-ton carriers (Sinha, 2019). The United Nations Conference on Trade and Development (UNCTAD) reports that while South African ports move about 300 million tonnes of cargo in exports and imports, the nation needs to have registered ships. In 2021 alone, container port throughput in South Africa was 4029000 twenty-foot equivalent units (TEU). Fleet ownership is 987 thousand Deadweight tons (DWT), while the Fleet (National flag) is 106 ships. The fleet (national flag) is 334 thousand DWT, and 455 Gross tons (GT) is the number of shipbuilding. The number of seafarers (n) is about 3030. The number of port calls in South Africa is 7194, while the Fleet

Ownership is 987 thousand DWT (UNCTAD, 2022). Foreign vessels, ships, and boats employing about 240000 alien seafarers carry almost ninety-five percent (95%) of South Africa's total exports and imports trade by volume as well as eighty percent (80%) by value (UNCTAD, 2022). In his *"2020 State of the Nation Address,"* Cyril Ramaphosa 2020 stated that the correlation between South Africa's economic growth and port volumes is that the nation has vast potential in the needed vessels to manage the quickly expanding offshore maritime trading activities. The nation can exceed the current 1.2% maritime contributions to the GDP and move over a million tonnes of liquid fuels on its coastline (Ramaphosa, 2020). In his article *"Africa Ports,"* Hutson (2022) finds that in 2021, South Africa registered a 5% increase in container containers at its ports, about 4.8 million TEU. What is promising for the Transnet Port Terminals is that the Durban port registered a 2.97 million TEU throughput from 2017's 2.7 million, a 10% increase (276000 TEU). For Durban, 83.1 million tonnes were the total cargo throughput comprising all the products, up from 2017's 78.1 million tonnes (6.4%). The national figures are a 1.3% increase in 2017 capacity (294.2 million tonnes compared to 290.4 million tons). While there is a decline in the number of vessels and ships at South Africa's ports, the figures need to reflect the growing cargo volumes and usage of larger vessels and ships, particularly container vessels (Hutson, 2022). While the nation registered a declined number of vessel or ship calls between 2019 and 2020 due to the COVID-19 pandemic, about 13000 ships arrived at the ports after the pandemic. Richards Bay offers better value to the nation because of its lead in exports (Hutson, 2022).

Mlambo (2021) indicates in his article *"The Impact of Port Performance on Trade: The Case of Selected African States"* that international ships find South Africa a good bunker port because of the mineral-rich diversity and significantly cheaper fuel oil and bunker resources. Very large crude carriers (VLCCs), vessels, and Ore Carriers focus on the nation's deep mineral resources, enabling South Africa to host about 1.22% of the international dry bulk carrier port calls (Mlambo, 2021). South Africa's container vessels and liquid bulk calls reflect about 0.4% of the international traffic. The leading seaports contribute about 92% of the nation's 30400-million-dollar shipping trading and export to the USA, China, and Germany. The correlation between South Africa's port volumes and economic growth is that besides the discrepancies in port performance affecting national transport logistic chains, they make the nation less effective than it must be (Mlambo, 2021:135). South Africa registers small percentages of global trade due to port capacity issues, like wasteful handling time, corruption, and poor security. In the article *"South Africa - ports and Marine,"* the International Trade Administration states that the correlation between South Africa's port volumes and economic growth is that the recent performances of South Africa's ports have a constructive impact on South Africa's trading and economic growth (International Trade Administration, 2021). Hence, the effectiveness of South Africa's transportation logistics chains and ports is crucial for national transformation and economic growth prospects. The ports are a transportation system vital to economic integration into the international maritime market. South Africa

must change their understanding of ports and invest heavily in sustainable port infrastructure. South African ports are currently inefficient and partly congested due to the inability to accommodate expansions without investments. To successfully compete with other shipping nations, the ports in South Africa require contemporary technological infrastructure. The government must pursue rigorous courses in port infrastructure progress to maintain its current financial growth and improve national efficiency and trading competitiveness (International Trade Administration, 2021). Increased port investments guarantee better accommodation of departures or arrivals and efficient and safe loading/unloading.

Meyiwa and Chasomeris (2020) studied *"South Africa's Port Doctrine: Dilemmas and the Way Forward."*. They found that for better correlation between South Africa's port volumes and economic growth, South Africa must increase investment in shore-side intermodal networks, which serve the ports). Better consideration of rail or highway infrastructure, which extends or develops intermodal facilities and connectivity, ensures better access to effective transport modes and adequate capacity. Decongestion of the transport corridors removes the burden on the ports and makes goods arrival and departure of ships from the ports. Increased investment in the intermodal networks serving the seaports allows the nation to bolster trade and foster sustained prosperity. Protecting fragile maritime ecosystems and utilising abundant ocean resources can create more sustainable employment (Meyiwa and Chasomeris, 2020). Developmental projects, such as deepening or widening Durban's entrance channel, building bridges, or constructing car terminals for automobile transit, create more jobs for South Africans. In their article *"Associations between logistics and economic growth in Africa,"* Chakamera and Pisa (2021) suggest that the correlation between South Africa's port volumes and economic growth is stronger due to the port's positioning in natural locations and increased bulk handling capacities. Strategic projects, such as the Richards Bay Expansion Project, the addition of liquid bulk terminals, and the upgrading of services and roads, offer South Africa's port an increased advantage in commercial corridors because they link regions like East Africa to provinces like Gauteng, Limpopo, and Mpumalanga (Haasbroek, 2022). For instance, the Cape Town port is strategically positioned as a hub for cargo between the Far East and South America. The substantial growth of cargo in East and West Africa makes the Cape Town Container Terminal an ideal terminal for transhipment cargo. All global cruise liner vessels now dock at the Cape Town Port as their first call port. While upgrading and positioning the ports and terminal facilities make them new gateways for travellers, products, and tourism, port re-engineering creates additional capacity for the bulk products at the port terminals (Chakamera and Pisa, 2021).

The reviewed studies reveal a strong positive relationship between port volumes, trade flows, and economic growth in South Africa. Increased cargo throughput and improved port efficiency are closely linked to enhanced trade competitiveness and national economic performance. However, persistent challenges such as congestion, inadequate intermodal connectivity, and underinvestment in port infrastructure weaken this relationship. The literature therefore suggests that expanding port capacity,

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modernising infrastructure, and improving logistics networks are essential for strengthening the contribution of port activity to long-term economic growth.

Conclusion

South Africa's participation in the shipping industry promotes economic growth by providing access to global markets. The country's ports play a crucial role in the global supply chain, connecting South Africa to other countries and providing South African businesses with access to international markets. The shipping industry facilitates trade between South Africa and other countries, which is crucial for economic growth. The shipping industry enables the movement of goods and services between countries, essential for trade and commerce. The shipping sector plays a crucial role in this process by enabling the movement of goods and services between countries. The shipping industry supports the growth of other industries in South Africa. The shipping industry is a key driver of economic activity in South Africa, as it supports the growth of other industries such as agriculture, mining, and manufacturing. This systematic review examined the maritime–economy nexus in South Africa, with particular emphasis on the contribution of shipping and port activities to economic growth, trade performance, and job creation. The findings demonstrate that South Africa's strategic geographic location, extensive port network, and integration into global maritime trade position the maritime sector as a critical driver of national economic development. Government-led initiatives, most notably Operation Phakisa and the Comprehensive Maritime Transport Policy, have created a policy foundation for expanding maritime participation and strengthening the ocean economy.

The review further highlights that efficient port operations and increased shipping participation are closely associated with improved trade competitiveness and economic growth. However, persistent challenges—including port congestion, infrastructure constraints, regulatory inefficiencies, and skills shortages—continue to limit the sector's ability to fully realise these benefits. Addressing these constraints through targeted infrastructure investment, improved governance, and enhanced intermodal connectivity is therefore essential.

In terms of employment, the maritime sector presents significant opportunities for both direct and indirect job creation across shipping, port services, manufacturing, tourism, and related industries. While technological advancement and automation improve efficiency and global competitiveness, they also raise concerns about labour displacement, particularly for low-skilled workers. This underscores the importance of aligning maritime development strategies with skills development, education, and inclusive labour policies. Overall, the review underscores the strategic importance of the maritime sector in advancing South Africa's economic growth and employment objectives. Strengthening policy implementation, modernising port infrastructure, and investing in human capital will be critical for ensuring that shipping and port activities contribute to inclusive and sustainable development. Future

research should build on this review by incorporating empirical analysis to quantify the economic and employment impacts of maritime activities in South Africa.

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