

An Assessment of the Contribution of Ports, Harbours and Maritime Transport to Kenya's GDP: A BE Perspective

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1. Kenya's Economic Performance

Period	Economic Growth (average %)	Remarks
1963-1973	6.6	
1975-1979	7.2	
1980s	4.2	1979-1980: 2 nd oil price shock and between 1983-1984 low agricultural production due drought
1990-1993	-1	1991-1993: low agricultural production, high inflation & debt
1994-1996	4	Adverse weather, suspension of donor aid.
1997-2001	2	
2003-2007	7	Period of economic recovery: ERS, Debt/GDP reduced from 80% to 27%, GDP growth improved
2010-2020	5.3	Higher levels of growth projected but subdued by the corona pandemic, high debt/GDP ratio, etc.

2. Economic Structure and Implications for BE Sectors

- ❑ The various sectors of the economy contribute differently to GDP:
 - Agriculture continues to dominate: By 2005, the sector's contribution was 24% of GDP, employed about 68% of rural population and constituted about 50% of export revenue. By 1980, about 80% of working Kenyans depended on agriculture. This dominance has continued to grow to about 34.1% of GDP
 - This significant contribution of the agricultural sector meant that: policies, strategies and resources were prioritized in favour of the agricultural value chain.
 - Huge budgetary allocations were used in agricultural development initiatives-the financing of various government owned enterprises such as Agriculture Finance Corporation (AFC), Industrial & Commercial Development Corporation (ICDC), Kenya Farmers Association (KFA) and the like.
 - Other favored sectors include: manufacturing contributing 8.4% on average, while transportation and storage's contribution average was 8%, financial and insurance activities at 6.6%, real estate sector at 7.2%
 - **BE sub-sector of shipping and storage contributed a subtle 1% over the review period.**
 - **BE sub-sectors: shipping and ship building, maritime transport, Port and inland waterways development, deep sea mineral exploration, mining and extraction, ocean oil and gas, energy, eco-tourism, fisheries and aquaculture have not be given due recognition-government policies, strategies & reforms did not include them in the development policy hence the insignificant performance.**
 - **The opportunities offered by the ocean economy sectors, if sustainably exploited offer latitude for improved economic contribution to the local and national economy.**

3. Kenya's BE Agenda

The [World Bank defines](#) the blue economy as the “sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and marine and coastal ecosystem health.”

Seas and oceans are a unique natural capital:

- ✓ They cover 70% of the globe.
- ✓ There are 350 million jobs associated with the oceans in fishing, aquaculture and seaside and marine tourism.
- ✓ Over 50% of the oxygen we breathe comes from the oceans and they absorb 30% of carbon emissions.
- ✓ Over 90% of traded goods travel by sea, making shipping a keystone of the world economy.
- ✓ Blue economy activities provide a livelihood for over 820 million people.

- ✓ Fish account for nearly 20% of the average animal protein intake of 3.2 billion people.
- ✓ USD 24 trillion: the overall value of key ocean assets.
- ✓ Assets that rely on healthy ocean conditions produce two-thirds of the base economic value of the ocean.
- ✓ Based on the gross marine product, the ocean is the seventh largest economy in the world.

3. Kenya's BE Agenda...cont..

- The transition to a blue economy is seen to significantly contribute to the achievement of Sustainable Development Goal (SDG) 14 for the ocean and other goals such as poverty reduction, food security, energy security, climate change adaptation and mitigation, among others.
- **The Kenya government has embraced the blue economy concept which, since 2012 Rio+20 Conference, has gained international acclaim and has been identified as a pathway toward sustainable blue growth. The Conference underscored the need to stimulate “blue growth,” particularly for island nations and developing countries with significant coastlines and/or maritime areas. Also hosted the BE Conference in 2018 & what we are doing now is a consequence of the recommendations of that conference.**
- **In addition, from a Kenyan perspective, it is important to note that:**
 - ❖ **The estimated annual economic value of goods and services in the marine and coastal ecosystems of the blue economy in the WIO region is over US\$22 billion ;**
 - ❖ **Kenya's share of the WIO region's blue economy is slightly over US\$4.4 billion (20%), according to the Kenya Maritime Authority (KMA) estimates and,**
 - ❖ **Kenya's marine fisheries had the potential of producing 350,000 metric tonnes in 2013 worth Ksh90 billion (KMA), yet the region only yielded 9,134 metric tonnes worth Ksh2.3 billion in that year.**
- **These and other benefits will be lost unless concerted efforts geared towards the development of the blue economy sectors are undertaken.**
- **Also Kenya's Economic Blue Print, Vision 2030 and the MTP III underline that the BE sub-sectors are important and that they are cornerstones for responsible, sustainable and environmentally friendly economic growth conduits.**

4. P, H & MT Contribution to Kenya's GDP

- P, H, and MT and their related efficiency and logistical activities have become an integral part of international trade, playing a vital role of:
 - ❖ Facilitating global seaborne trade and commerce,
 - ❖ Stimulating import-export trade,
 - ❖ Revenue and taxes generation,
 - ❖ Employment creation,
 - ❖ Value addition,
 - ❖ Asset creation, branding, packaging and storage.
- Studies have shown that poor performance of this sub-sector hampers not only the above mentioned processes but also limits the economic growth of the hinterland.

➤ A. Direct Benefits:

1. Contribution of Export/Import Trade: In normal circumstances and depending on the nature of the product, ceteris paribus, it is expected that there is positive correlation between a country's export performance and economic growth, meaning that an increase in exports brings in increased foreign exchange earnings which are then utilized domestically to finance growth processes which in turn improve GDP. The opposite is true when imports surpass exports. **Hence a positive BoP should have a positive effect on GDP growth and the opposite is true.**

- ❖ **In the period under review, Kenyan exports of goods as percentage of GDP was 13% and imports of goods as percentage of GDP was about 22%. The net contribution was therefore negative. This was due to the negative economic shocks that affected the economy.**

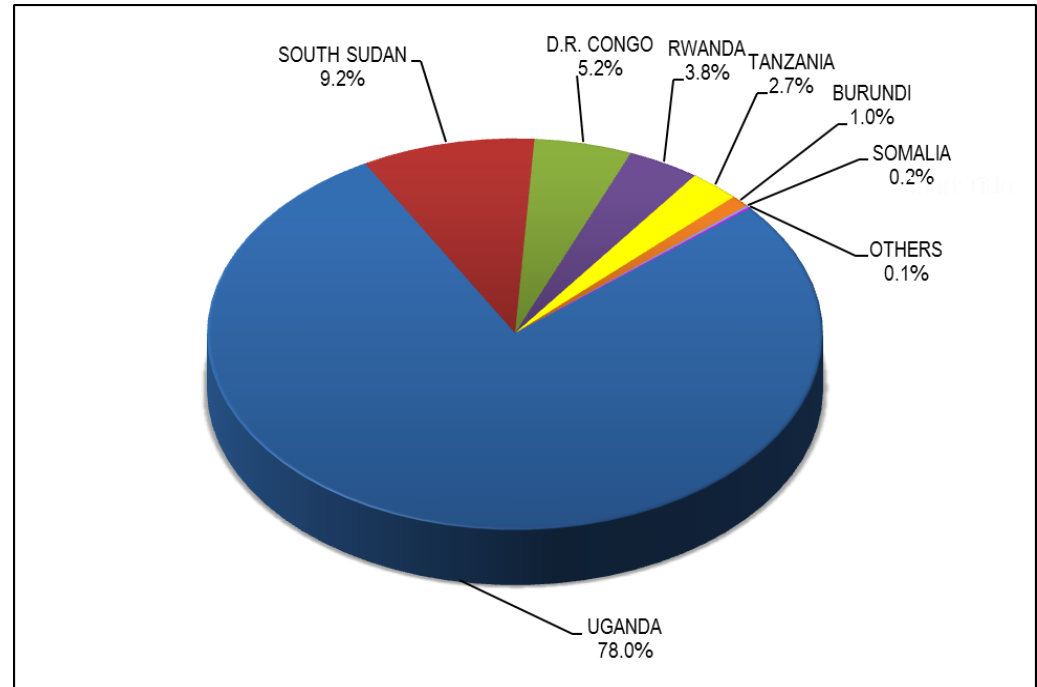
4. P, H & MT Contribution to Kenya's GDP...cont...

2. Contribution of Increased Regional Transshipment Export/Import Trade & Transit Cargo:

➤ Cargo to:

- ❖ Uganda-about 78%
- ❖ RSS-9.2%
- ❖ DRC-5.2%
- ❖ Rwanda-3.8%
- ❖ TZ-2.7%
- ❖ Burundi-1%
- ❖ Others-0.1%

- Increased transshipment trade has a positive effect on GDP



4. P, H & MT Contribution to Kenya's GDP...cont...

- **3. Increased Containerization:** Container traffic has continued to increase in tandem with the worldwide increase in the rate of containerization of seaborne trade:
 - ❖ Our analysis also shows that containerized imports increased by about 46% while containerized exports increased by about the same percentage on average over the 2016-2020 period
 - ❖ Notable is the decrease in container traffic in 2020 as a consequence of the effects of covid-19 on the global economy.
- **4. Improved Revenues and Higher tax Contribution: An increase in Port revenues and profits have a positive effect on both local and national economies:**
 - ❖ The total revenues increased from Kshs. 29.9 billion in the 2013/14 financial year to kshs 34.8 billion in 2014/15, kshs 38.8 billion in 2015/16, kshs 40.2 billion in 2016/17, kshs 43.6 billion in 2017/18 and reached kshs 50.2 billion in the FY 2019/20, representing an average 9.5% annual change over the entire period.
 - ❖ Profit before tax registered an average increase of 12.6% over the entire period reaching kshs 8.2 billion in the 2019/20 financial year.
 - ❖ The percentage share of total port revenue to sub-sector GDP has stabilized at around 12% with a high of 13.9% in 2018/19 financial year.
 - ❖ On the other hand, the share of total port revenue to overall GDP is about 1% on average.

4. P, H & MT Contribution to Kenya's GDP...cont...

- **5. Increased Trade Transportation Connectivity and Market Capture:** The number of vessels visiting a port is dependent on several things among them port connectivity as well as market capture and these have an effect on Port performance:
- ❖ the total number of ships that visited the Port of Mombasa in 2020 was 1,621.
 - ✓ 33.3% of those ships were container carriers,
 - ✓ 7.2% were general cargo carriers,
 - ✓ 18.8% were bulk, 12.5% were tankers
 - ✓ 8.6% were car carriers.
 - ❖ Northern Corridor Countries: are poorly interconnected with trade transportation regionally and internationally and this is reflected in their poor ranking on both the World Bank Logistics Performance Index (LPI) and the UNCTAD Liner Shipping Connectivity Index (LSCI):
 - ✓ Out of 155 economies ranked in the WB LPI, Northern Corridor countries are ranked in the bottom 50 consistently between 2007 and 2012.
 - ✓ Similarly, out of the 152 economies ranked in UNCTAD LSCI, these key transit countries rank poorly. This negatively affects vessels calls and contributes to poor port performance.

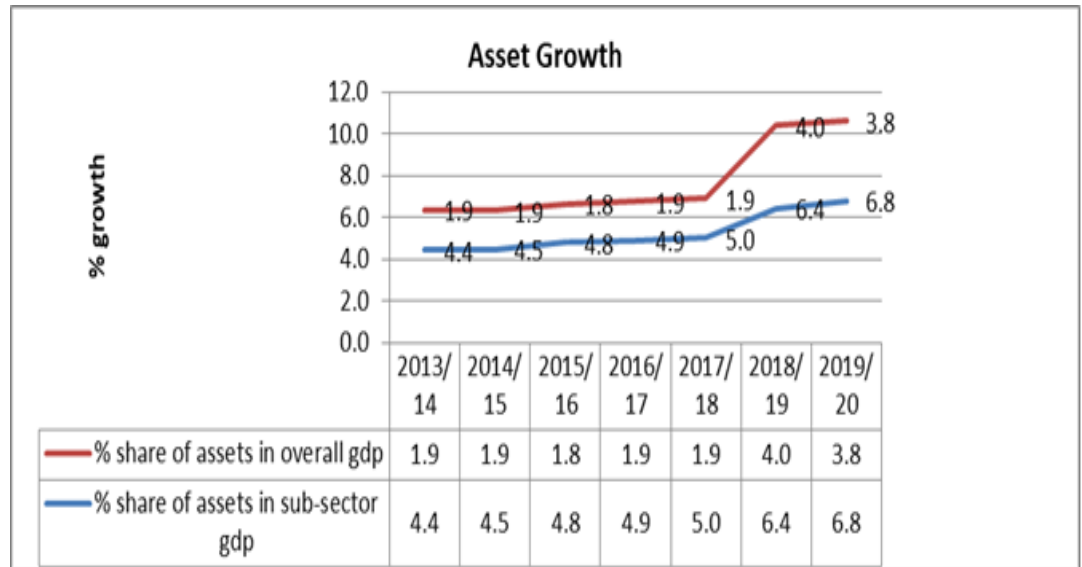
4. P, H & MT Contribution to Kenya's GDP...cont...

- **6. Increased Employment:** Ports across the globe have been seen to positively influence the creation of employment opportunities:
- ❖ **Studies have shown that:**
 - ✓ An increase of one million tonnes of port throughput is associated with an increase in employment in the port region of 0.0003% implying that in a region with one million employees, employment would increase by 300 units while in the long run this increase would be 7500 units. If liquid bulk is not included in the analysis, employment increases to 600 units.
 - ✓ It was also found out that private ports have the largest employment impacts in regions with one million additional tonnes of port throughput creating 1000 jobs.
 - ✓ KPA wage bill, with wages being used as proxy for total employment, is about 5.2% of sub-sector GDP and about 0.4% of the overall GDP.

4. P, H & MT Contribution to Kenya's GDP...cont...

7. Increased Asset Creation:

Data: shows that the share of the book value of KPA assets in sub-sector GDP has tended to increase over time from 4.4% in the 2013/14 FY, to 4.5% in the 2014/15 FY and attained a high of 6.8% in the 2019/20 FY.



4. P, H & MT Contribution to Kenya's GDP...cont...

➤ B. Indirect Benefits include:

- ✓ Indirect employment effects through the linkages of harbors with other economic sectors and the spatial interactions with large logistics and economic poles outside port areas;
- ✓ Induced benefits which accrue locally and throughout the wider national or supranational economy due to purchases of goods and services by those directly employed in the Port. Employment in grocery stores, local construction industry (housing), retail stores, health care providers, local transportation services, local and state government agencies providing public services and education to those directly employed, and businesses providing professional and business services in support of those directly employed.
- ❖ **1. Increased Employment:** Employment opportunities created in port related entities such as banks, insurance companies, freight forwarding, transport, etc.
- ❖ **2. Vibrant Local Economy:** a) Increased consumer spending and tax remittances, b) Tourism promotion, c) Decongesting Mombasa City and d) Environmental Protection.
- ❖ **3. Customs Duty Collected by KRA:** Benefits the whole economy. Customs duty as a % of GDP increased from 12.4% in 2013/14 FY to 14.3% in 2016/17 FY before declining to 13.0% in the 2017/18 FY.
- ❖ **4. Hinterland Infrastructural Development:** EPZs, SEZs, ICDs, CFSs, SGR, Mombasa Area Port Development Project

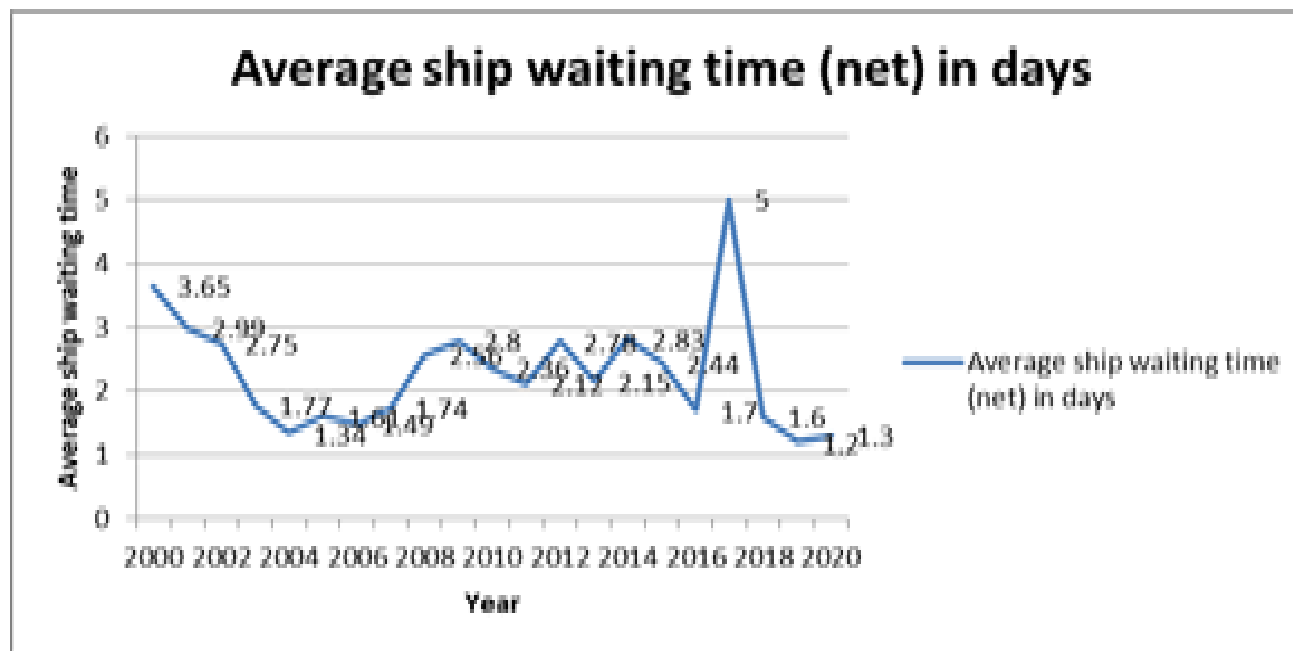
5. Challenges to the performance of the Sub-sector

Terminal	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General cargo berths	63.9	60.9	61.4	64.4	63.5	73.3	75	78.4	83.5	81.5
Mombasa container terminal	94.5	75.7	82.7	93.0	91.4	52.9	71.6	56.6	64	64.1
Shimanzi oil terminal	81.8	80.1	77.5	75.7	79.2	86.6	88.4	86.4	82.6	81.7
Kipevu oil terminal	84.5	80.2	83.5	79.4	86.0	82.7	78.1	75.8	70.7	43.5
Mbaraki wharf	76.2	79.3	56.0	62.2	55.8	40.9	53.4	38.9	33.7	25.9

1. *High Berth Occupancy Rates across all the terminals:*

- ❖ An indication of congestion at the port which in turn leads to higher vessel delay surcharges, higher cargo handling charges and higher other KPA related charges. This has a detrimental effect on freight charges which in turn tend to increase overall transportation costs.
- ❖ A high berth occupancy rate also increases berth dwell time and logistical costs-more time spent at the OSC and DPC
- ❖ Causes of the high berth occupancy rates include: insufficient berths; few or unreliable gantry cranes, and insufficient, inadequate or unreliable container yard equipment, among others.

5. Challenges to the performance of the Sub-sector...cont...



2. Ships waiting time:

- ❖ Average waiting time per ship is predominantly high, at 2.5 days per ship, but this trend is also characterized by large variations especially during the rainy season-poor road infrastructure.
- ❖ Cargo handling process is not only inefficient but also unreliable and unpredictable.
- ❖ The slow off-take of cargo has implications for vessel turnaround time.

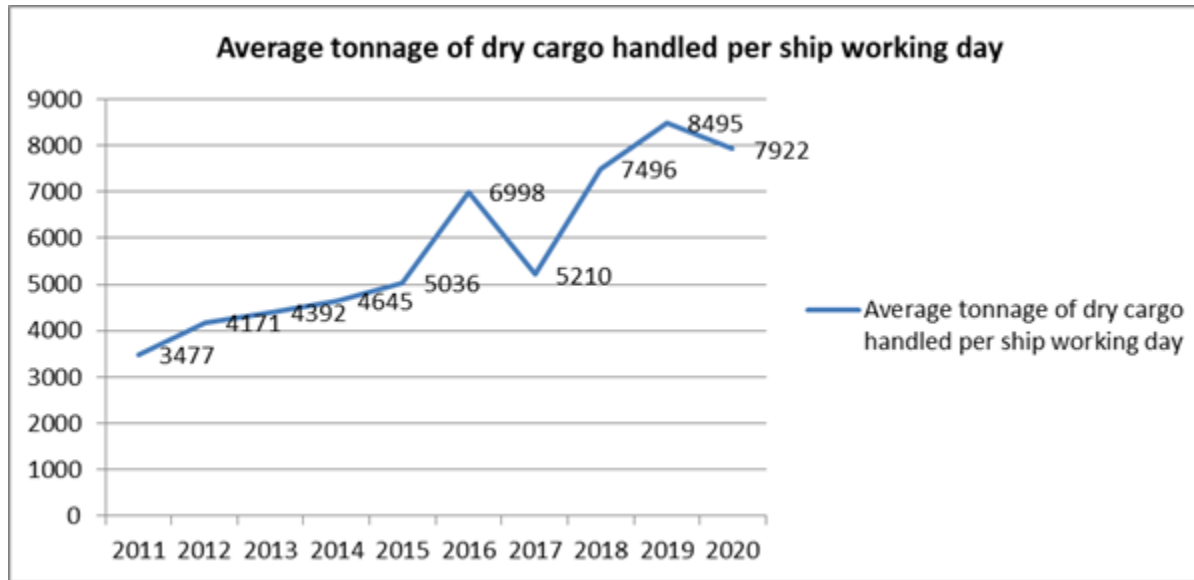
5. Challenges to the performance of the Sub-sector...cont...



3. Ship turnaround time:

- ❖ Is an important indicator of overall port efficiency and is influenced mainly by arrival rates, waiting times and cargo off-take.
- ❖ Also a good indicator of the efficiency of shipping operations, cargo loading and unloading, and onward clearance to other cargo destinations.
- ❖ Further indicates the condition and efficiency of port equipment, its information management systems, and its workforce productivity.
- ❖ Chart above shows that ship turnaround time has been above the target of 3 days for the most part-inadequate and aged facilities, poor hinterland transport connectivity, inefficient document and cargo clearance procedures and slow cargo loading/unloading.

5. Challenges to the performance of the Sub-sector...cont...



4. Productivity at the Port:

- ❖ On average, dry cargo handled per ship working day increased from 3,477 tons in 2011, increasing thereafter to 6,998 tons in 2016, declining and then rising to attain a high of 8495 tons in 2019 and thereafter declining to 7,922 tons in 2020.
- ❖ These unpredictable changes in productivity suggest that there are some fundamental issues related to productivity that need attention. These could include: labour force productivity issues, per gang shift issues, equipment availability and reliability, etc.

5. Challenges to the performance of the Sub-sector...cont...

Berth/Wharf	Allowable LOA	Number of Calling Ships	Ships with Longer LOA Than Designed LOA	Ratio
Mbaraki	276m	7	0	0 %
No.1	156m	180	162	90 %
No.2	150m	4	3	75 %
No.3	150m	78	72	92 %
No.4	171m	95	23	24 %
No.5	161m	111	85	77 %
No.7	187m	62	23	37 %
No.8	154m	39	5	13 %
No.9	162m	62	52	84 %
No.10	184m	56	37	66 %
No.11	166m	106	69	65 %
No.12	165m	113	4	4 %
No.13	157m	104	84	81 %
No.14	163m	87	72	83 %
No.16	160 m	108	101	94 %
No.17	165 m	103	100	97 %
No.18	215 m	116	36	31 %
No.19	216 m	2	-	-
Total		1,433	928	65 %

5. Inadequate berth length for calling vessels:

- ❖ Most of the ships visiting the port are longer than the designed berth LOA. This is true across most of the berths. This implies that the berths cannot be efficiently and productively used due the inadequate length.

5. Challenges to the performance of the Sub-sector...cont...

6. Arbitrary change of berths versus fixed berth system:

- ❖ There is arbitrary change of commodity designated berths. This has the effect of reducing productivity as it takes time to mobilize stevedoring labour and cargo handling equipment.

7. Crime related challenges:

- ❖ Maritime security is of paramount importance to Kenya as the country relies heavily on the ocean for transport, trade, food, and international communication.
- ❖ Thus, threats to maritime transport have far-reaching knock-on effects on trade, food security, tourism, and other ocean industries.
- ❖ Reviewed literature underlines the fact that piracy and armed robbery at sea, illicit trade in crude oil, arms and drugs trafficking, human trafficking and smuggling of contraband goods, marine pollution, and illegal activity in protected areas require enhanced regional and international collaboration to overcome (see Nyonje, Ouma and Orina, 2020).
- ❖ In 2016, the Business Daily Africa reported that Kenya lost an estimated KSh10 billion (US\$100 million) in revenue, annually, due to illegal fishing alone.

8. In the geo-political arena, the maritime boundary dispute with Somalia which is before the International Court of Justice (ICJ) needs to be settled as Kenya could lose a significant proportion of its ocean resources.

6. Towards Improving Contribution of P, H and MT to GDP

1. *Need for an Integrated Approach to Sub-sector Master Planning and Development:*

- ❖ Many port development initiatives are going on **concurrently-Vision 2030 and the MTP III, Mombasa Master Plan including Dongo Kundu, KPA, Mombasa Port Development Project, LAPSSET and Lamu Port Development Project, KENTRADE, etc.**
 - ✓ **These initiatives should continue due to the existing and forecasted demand for sub-sector services and to reduce port infrastructure deficit but moving forward, there is need for coordinated Master Planning for the long term and through out the project cycle** (conceptualization and planning stage, through studies and designs, transactionary finance services, implementation, coordination and monitoring and commissioning).

2. *Mombasa Port Expansion:*

- ❖ Berths, terminal construction , dredging of the harbour to be able to accommodate larger vessels ongoing . The port has seen completion of the 1st phase of the Second Container Terminal, called Kipevu Container Terminal, with an annual capacity of 1.65 million TEUs.
- ❖ Ongoing construction of other smaller ports such at Shimoni, Kipevu, Port Reitz, etc.
- ❖ Ongoing revival, redevelopment and expansion of Kisumu port, to improve movement across L. Victoria, and increase trade across E. Africa

6. Towards Improving Contribution of P, H and MT to GDP...cont.

3. *LAPSSET and Lamu Port Project:*

- ❖ One of the flagship infrastructure projects identified by the Government in Kenya Vision 2030 is the development of a new transport corridor linking a new and modern Port of Lamu with Garissa, Isiolo, Maralal, Lodwar and Lokichogio and branching at Isiolo to Moyale at the border with Ethiopia and proceeding to the border with Southern Sudan.
- ❖ The corridor comprises :
 - ✓ Standard gauge railway line
 - ✓ Road network
 - ✓ Oil pipeline (Crude & product)
 - ✓ Oil refinery (Isiolo/Lamu)
 - ✓ International Airports (Lamu, Isiolo and Lokichogio)
 - ✓ Port at Lamu (Manda Bay).
 - ✓ Resort cities (Lamu, Isiolo and Lake Turkana)
- ❖ First berth launched in May 2021. Once complete, the new port will have 32 Berths as well as ship building and repair center and is intended to unlock logistics and trade and create a regional transport hub. The port will be able to handle the largest ships in the world as it will have a 500m wide channel with a depth of over 18 meters. By the year 2030, the port is expected to handle more than double the containers handled by the Mombasa port thus providing a competitive environment and trading flexibility as well as reducing pressure on the Mombasa port.

6. Towards Improving Contribution of P, H and MT to GDP...cont.

❖ *Other components include:*

- ✓ improving multimodal transport and inter-country/county connectivity, exploration of marine resources by increasing commercial fishing,
- ✓ offshore and inland mineral exploitation, shipping, international and regional trade, carbon sequestration as well as international tourism.

4. *Other Ongoing Infrastructural Projects:*

- ❖ Mombasa Port Area Road Development Project
- ❖ Upcoming SEZs, Dongo Kundu (National Government) and Miritini SEZ (county project)
- ❖ Special Economic Zones to spur manufacturing and economic activities around Mombasa, and create more employment opportunities
- ❖ Projects under the Mombasa Master Plan

5. *Investment in port equipment:*

- ❖ The port needs a major audit of its quay equipment, such as Ship-to-Ship gantry cranes, transfer equipment such as tug masters and straddle carriers, and yard/stacking equipment, such as reach stackers, forklifts and Rail-mounted Gantrys- identifying equipment suitability, availability, productivity and if equipment is adequate to meet the demands of the projected traffic.

6. Towards Improving Contribution of P, H and MT to GDP...cont.

6. Investments in ICT & Automation of Operations: 4 Major ICT developments recently that cut across the port industry, aimed at automating the industry, use of Artificial Intelligence, make it paperless, and reduce human interaction-basically systems put in place to improve efficiency and address aspects of corruption as well.

- ❖ KWATOS – Kilindini waterfront system, by KPA-To automate clearance and gate in / out processes, documentation, etc.
- ❖ Integrated Customs Management System – New system By KRA – still under roll out phase. To phase out the current Simba
- ❖ System (Tradex) Linked to Itax, and other systems, to improve tax collection
- ❖ KenTrade Electronic Social Welfare Surcharge and Maritime Single Window System
 - ✓ Promote & Facilitate International Trade
 - ✓ Reduce Complexities in clearance and improve
 - ✓ efficiency
 - ✓ Bring all actors under one roof for ease of processes, visibility and monitoring.

6. Towards Improving Contribution of P, H and MT to GDP...cont.

7. Increase qualified staff and training:

- ❖ Marine education and training is offered through:
 - ✓ The Kenya Marine and Fisheries Research Institute (KMFRI),
 - ✓ Universities,
 - ✓ Bandari Maritime Academy,
 - ✓ Coast National Polytechnic and Railway Training Institute (TRI) Marine School,
 - ✓ Kisumu and Technical Vocational Education and Training (TVET) institutions.
- ❖ In the process of satisfying their mandates, these institutions face a lot of challenges:
 - ✓ Shortage of instructors and lecturers with professional training in maritime related disciplines,
 - ✓ Shortage of opportunities for onboard training for students who complete shore-side training
 - ✓ Inadequate training facilities and equipment to enable students acquire the practical training to attain the competencies for Standards of Training, Certification and Watch-keeping for Seafarers (STCW) 1978.

6. Towards Improving Contribution of P, H and MT to GDP...cont.

8. Integrated Environmental and Social-economic Considerations:

- ❖ Some of the legislations and plans that address the various aspects of environmental-social-economic issues from a blue economy perspective and which will need integration and synchronization:
 - ✓ National Environmental Management and Coordination Act,
 - ✓ Fisheries Management and Development Act, Wildlife (Conservation and Management) Act,
 - ✓ National Environmental Policy for infrastructure projects in the blue economy,
 - ✓ Forest Act, Maritime Zones Act, the Integrated Coastal Zone Management (ICZM) Plan,
 - ✓ the Marine Protected Areas (MPAs), the Locally Managed Marine Areas (LMMAs),
 - ✓ the mangroves specific Forest Management Plan and the Marine Management Plan, among others.
 - ✓ The completion of the Marine Spatial Plan as a tool for integrated environmental management decision making will go a long way into the identification of the different uses and the much needed sectoral diversity of the blue economy.
 - ✓ To mitigate against these negative cumulative impacts resulting from projects in the Mombasa Master Plan, an Environmental Strategic Impact Assessment needs to be undertaken and should include a community driven Ecosystem Management Plan geared towards the restoration of the original ecosystem functions.
 - ✓ Enhance the roles of KMA, KPA and NEMA as environmental leaders-monitoring, evaluation and management of environmental violations.

7. Recommendations

1. Concerted efforts need to be made in order to measure the actual size of Kenya's blue economy. Apart from the traditional sectors of fisheries and tourism, by and large, there is lack of disaggregated data that quantifies the economic and social value of Kenya's blue economy. In addition, there is need to add a blue economy sub-sectors' account into the KNBS national accounts in order to easily monitor the performance and contribution of the blue economy to Kenya's GDP. This will also ease BE planning and investment decision making;
2. A synthesis of the plans and expected outputs of the LAPSSET, Mombasa Master Plan, Vision 2030 flagship projects and other related projects should be undertaken in order to avoid duplication of effort and also help in the identification of low hanging fruits that can be implemented as we move towards the finalization of a Blue Economy Strategy for Kenya;
3. The Kenyan Government should strive to ensure that the security and safety of both persons and goods within the maritime transport, harbours and ports are guaranteed and is impeccable to encourage more investments and utility of the Maritime transport and its hinterland connections. Programs related to the development of maritime safety and security and the natural maritime environment in/out of the port need to be prioritized.
4. The Government of Kenya should effect the establishment of more well equipped centres of learning and research, including Institutes for Blue Economy and Oceans Studies whose main objective shall be to undertake research and offer technical assistance and capacity building in all matters relating to the ocean, and the sustainable use of its resources;

7. Recommendations...cont...

5. Ensure developments undertaken are backed by scientific and statistical data and forecasts, to be able to keep up with estimated growths/traffic/throughput
6. Planning of projects (Master Planning) to be done with long term / strategic view, to avoid projects being rendered obsolete or 'white elephants' in less than a decade – costly especially mega projects, ICT
7. Marrying of projects and long term visions, especially infrastructure, with those of neighbouring countries, good example is road, SGR, pipeline,
8. Promote healthy competition between ports, ports to compliment one another rather than compete with each other. Specialization is key. Eg. Mombasa and Dar serving almost the same hinterland, should focus on the strengths and build up on the same.
9. Take advantage of opportunities offered by the coming into force of AfCFTA.
9. Promote value addition industries, to attract FDI and foreign companies to put up in SEZs, logistics parks etc., not only in logistics, but whole value chains and manufacturing, assembly, etc.

THANK FOR YOUR ATTENTION