Bandari
OIL & GAS TERMINAL LTD

Review of Pre-feasibility Study: Main Report and Financial Model on the

Mtwara Common User Quay Facility Project for Oil and Gas Supply Base Project

Submitted by

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EXECUTIVE SUMMARY

This report contains views on the Pre-feasibility Study Report by AECOM on the proposed Mtwara Common User Quay Facility Project for Oil and Gas Supply Base. The review was undertaken by a multi-disciplinary team of experts ranging from port engineering, transportation planning and engineering to economics and marketing.

The concept design is in principle applicable, but for the case of Mtwara, it should be supported by appropriate geotechnical information, met-ocean data and other factors mentioned in the relevant sections of this report.

The financial model proposed in the pre-feasibility study is at a very early stage and only provides basic outlook of the economic and financial viability of the **project**. As noted in the supplementary notes "… [Themodel] has been developed for the purpose of sensitivity testing and to provide and [sic] baseline for adjustments and future assumptions". The report is clear about the depth of the contents of the model by giving a caveat that ***"… [The] model should not be relied upon for budget or business case purposes".*** It is our view that the caveat be taken seriously and cannot therefore be relied upon.

As for Traffic forecast: A thorough review of the Market Assessment Report reveals no forecast model is presented as purported in the main report, instead traffic forecasts are presented.

As for the Concession Strategy, the **build-own-operate-and-transfer (BOOT)** is recommended. Monitoring mechanisms need to be in place to ensure the quality of the assets agreed by the parties is upheld from construction to the end of the concession period. At the same time, proponents of the project should adhere to the National Public Private Partnership (PPP) Policy (2009), the Public Private Partnership (PPP) Act (2010), as well as the PPP Operational Guidelines for Tanzania Mainland (2010) and PPP Regulations (2011).

Overall, information contained in the report is very course and hence it is recommended that a proper pre-feasibility study be conducted.

1. BACKGROUND

Bandari Oil and Gas Terminal Limited (Bandari) intends to secure a 40 year concession agreement for an independent development and operation of a dedicated common user quay facility to support offshore and onshore oil and gas supply based activities in the free port zone within the port of Mtwara, Tanzania. As part of the concession agreement process, Bandari was required to initially undertake a pre-feasibility study and submit a report to the Tanzania Ports Authority (TPA). To this end, Bandari engaged AECOM to conduct a pre feasibility study to ascertain the technical design and financial viability of the project. AECOM conducted the pre-feasibility study and has submitted a report together with afinancial model to Bandari. As part of the quality assurance process,TPA has approached the University of Dar es Salaam Consultancy Bureau (UCB), herein referred to as **the Consultant**,a.k.a the Review Team, to review the main report and the proposed financial model and provide a third party opinion. Pursuant to the above, this document is a review of a pre-feasibility report on the proposed **Mtwara Common User Quay Facility Project for Oil Gas Supply Base.**

2. UNDERSTANDING THE TERMS OF REFERENCE

The overall objective of the assignment was to review the pre-feasibility study report and the proposed financial model for an envisaged 40 year concession agreement. It is the understanding of the Consultant that the review is expected to provide a third party opinion on how the pre-feasibility study was conducted and whether the findings and recommendations therein are adequate and conclusive. This review process is crucial as it provides an independent and objective opinion on the quality of the report and hence conclusive suggestions on the reliability and usability of the recommendations in report.

In response to TPA's request, UCB formed a multidisciplinary team of experts for the assignment. Agreement to proceed with the preparation of the report was reached at ameeting of the experts convened by UCB on 26th June 2015. A study team comprising the following experts was formed:

(1) Prof. Eng. Alfonse Dubi (Port and Coastal Engineer)
(2) Eng.Dr. Hannibal Bwire (Transportation Planning Engineer)
(3) Dr. Diana Philemon (Marketing)
(4) Dr. Elinami Minja (Finance)

During the meeting, the team deliberated on the approach for the review. In reviewing the report, the following would be undertaken:

(a) Discuss and have a common understanding of the TPA's Terms of Reference (TOR) to the University of Dar es Salaam.
(b) Review the Scope and Adequacy of the Methodology used by AECON and Recommendations therein for each of the TOR.
(c) Provide an overall recommendation on the quality of the pre-feasibility study report and financial model: mainly on usability/reliability of the findings presented in the report.

The Terms of Reference provided by TPA included, but not limited to the review of the following:

1. Technical presentation and industry standards of the concept design,
2. Economic and Financial Analysis (Financial Modelling),
3. Market Assessment
4. Traffic Forecast, and
5. Concession Strategy.

In interpreting the TOR, the team deduced tasks and responsibilities as shown in Table 1.

Table 2.1. Tasks and Responsibilities

1.	**TOR 1:** Technical presentation and industry standards of the concept design,	
	Relevant Chapter/Section	Chapter 3, Chapter 5: Sections 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, Chapter 11.
	Tasks	Evaluate/ Assess the choice of the design vessel and quay facility conceptual design
	Person Responsible	Alfonse Dubi
2.	**TOR 2:** Economic and Financial Analysis (Financial Modelling)	
	Relevant Chapter/Section	Chapter 5: Section 5.1; Chapter 6. Chapter 9, Chapter 10, Chapter 11.
	Tasks	(1) *Assessment of the economic value of the facility and suitability of the financial model.* The assignment entails an **Assessment of the underlying Assumptions** for each input to the financial model and how the figures used in the financial model were arrived at: • Periodic operating expenditure/expenses and revenues • Useful life of the facility – this is also to be informed by the engineers' assessment but it is also going to be an input to assessing the appropriate concession arrangements • Cost of capital (funds) and establishing appropriate discount rate (this is also to be linked to risk assessment to determine the appropriateness of employing risk-adjusted discount rate) • Assumptions related to any other area in the evaluation of

		the investment • The evaluation or assessment does involve re-running the financial model.
	Person Responsible	Elinami Minja
3.	**TOR 3:** Market Assessment	
	Relevant Chapter/Section	Chapter 4, Chapter 9, Chapter 10, Chapter 11, Appendix B
	Tasks	Critically evaluate the Market assessment methodology, content and conclusions
	Person Responsible	Diana Philemon
4.	**TOR 4:** Traffic Forecast	
	Relevant Chapter/Section	Chapter 5. Section 5.2, 5.3, Chapter 10, Chapter 11
	Tasks	Assessment of the proposed Traffic Forecast
	Person Responsible	Hannibal Bwire
5.	**TOR 5:** Concession Strategy	
	Relevant Chapter/Section	Chapter 5, Section 5.1,
	Tasks	*Assessment of the proposed concession strategy.* The focus here is going to be on identification of possible concession arrangement for this type of activity, assessing each (its costs and benefits in the broad sense) and making a recommendation on the most appropriate. Review of existing laws including the Public-Private Partnership Act and its regulations will be done.
	Person Responsible	Elinami Minja

This reporthas, therefore, been produced by the experts on behalf of the University of Dar es Salaam Consultancy Bureau (UCB). It has reviewed the Main Report and Financial Model in the Pre- Feasibility Study for the proposed Mtwara Common User Quay Facility Project for Oil and Gas Supply Base.

3. METHODOLOGY USED BY THE REVIEW TEAM

In undertaking the review, the team has relied on individual's professional knowledge and experience, various bibliography and literature. Subsequent to the advent of oil and gas exploration in Mtwara, a number of studies have been done and reports/publications have been produced. Some of the literature have been retrieved and referred to. The reviewers have searched such existingdocuments and used them.

4. COMMENTS ON THE CONTENT OF THE REPORT

4.1 General Comments

(i) Organisation of the report

The team finds the quality of the report generally good. Organisation of the report is also good. However, some figures and photos have no proper captions, e.g. figures on page 104-108 and all photographs in Appendix A do not have proper captions. Following pages after page 102 are not well numbered.

(ii) General perception on the pre-feasibility study report

It is worth noting that while the title suggests that it is a pre-feasibility study, we are of the view that the report ***is not*** for a full scale pre-feasibility study. This is evidenced from caveats in the report including one appearing in the executive summary on page 13 reading:

> It is critical to understand that a traditional pre-feasibility study of this nature would require anything from 6 to 12 months to complete and would likely yield cost estimates of greater accuracy than +/- 50%, which is currently required of this work.
>
> It is important that the work delivered here is not perceived to be a full scale pre-feasibility study, in the traditional sense. ***The extent of this pre-feasibility study is in name only***and constitutes what would otherwise be deemed conceptual. The short duration imposed on the study has meant that the **degree of engineering**, **cost estimating** and **scheduling/phasing**supporting the financial modeling is relatively coarse and not developed to the extent that would generally be preferred in studies of this nature. It is understood that a traditional full scale pre-feasibility study would be commissioned once the Concession Agreement with the TPA has been secured.

On one hand, it is assumed the client is aware of and is in agreement with these conditions. On the other hand these conditions, including the +/-50% margin of error, appear to be restrictive and unlikely to ensure value for money work to the client as far as a pre-feasibility study is concerned. A clear understanding of these by the client is important since under the PPP Operational Guidelines (2010); the contracting authority (the client in this case) is responsible for undertaking the pre-feasibility study. The PPP

Coordinating Unit and PPP Finance Unitare empowered to reject or approve the pre-feasibility study.

4.2 Specific Comments

4.2.1 TOR 1: Technical presentation and industry standards of the concept design.

(i) The Design Vessel

Offshore Vesselsare specially designed ships for transporting goods and personnel to offshore**oil platforms**that operate deep in the oceans. The size of these vessels ranges between 20 meters and 100 meters. They are good at accomplishing a variety of tasks in the supply chain. The category may include**Platform Supply Vessels (PSV),** and all types of specialty vessels including**Anchor Handling Vessels, Construction Support Vessels, Crane Vessels,Diving Support Vessels,Offshore barges,Drilling Vessels, Well Intervention Vessels, Ice Breaking Vessels, Cable Laying Vessels, Seismic Vessels,**and**Fire Fighting Vessels**. (http://maritime-connector.com/wiki/offshore-vessels/).

Of all of these vessels, **Platform Supply Vessels (PSV),** which are used to carry crew and supplies to the oil platform deep inside oceans, and bring cargo and personnel back to shore, have sizes varying from small 20 meter long ship to 100 meters long ships. These vessels are designed to transport a wide range of cargo such as drilling fluids, cement, mud, and fuel in tanks beneath the deck. The open deck on PSVs is normally used to carry other materials like casing, drill pipe, tubing and miscellaneous deck cargo to and from offshore platforms. Platform Supply Vessels are often equipped with firefighting equipment to deal with emergency situations.

It appears, therefore, the largest size of the PSVs, i.e. 100 meters can be taken as the size of the design vessel, given that such proposed development is a new project. This will then determine the number and length of berths having decided on frequency of vessel traffic.

(ii) Site Selection

Siting of a port or quay facility depends generally on wind and sea conditions. This means therefore, a major port or other types of marine terminals may require extensive field monitoring or analytical studies to be conducted well in advance of a conceptual design and later a detailed design. In addition, it is necessary to collect statistically adequate meteorological and oceanographic (Met/Ocean) and geotechnical/geophysical data. In the pre-feasibility study, information on site characteristics, bathymetry, currents and waves, albeit scanty, reflects the reality. However, one important meteorological factor has been overlooked. A study by Dubi (2001) on frequency and long-term

distribution of winds on coastal locations in Tanzania shows that Zanzibar and Mtwara experience offshore wind activity. The study also reveals that, of all the coastal stations in Tanzania, Mtwara experiences the strongest winds. It also reveals that Mtwara is prone to storms.

(iii) The concept design

The pre-feasibility study proposes a reinforced deck supported on steel or concrete piles for the following reason given on page 76:

> *A deck and pile arrangement is considered to be a highly suitable form of construction at Mtwara* given the predominance of rock and the suitability of the ground to support the potentially higher imposedvertical loads from containers, materials handling systems, services, and cranes etc. It is also a highly suitableform of construction to enable spare 'design capacity' to be built into the structure to permit design future proofingand allowance for corrosion in the marine environment.

And a mass gravity wall structure is rejected for the following reasons: (page 73):

> An advantage of this form of structure is that it does not suffer fromcorrosion damage and it is a highly robustberthing structure which does not suffer damage easily. Disadvantages of this form of construction is that it is verylabour intensive to construct, is unsuitable for carrying imposed crane loads of any significance and, it is a veryexpensive form of construction which requires heavy lift plant to constructand specialist skills to erect the walland to prepare the wall foundations.
> For the above reasons, *a mass gravity wall is not considered to be a viable technical option at Mtwara*.

Pile foundations are usually required at deep water locations with soft soils or in shallow water locations where the access to the underside of the deck is required; where water circulation is an important factor and it is detrimental to disruptsediment transport. Although pile or open type construction may be used at shallow rock locations, the cost to anchor the piles/columns to the bedrock and to provide adequate horizontal stability usually exceeds that of a suitable fill-type structure (Gaythwaite, J. 2004). In choosing the best option it is necessary to consider important factors that affect the relative cost of structure types. These include local cost and availability of construction materials, labour and the accessibility of construction equipment, local construction practices, environmental and regulatory concerns over water circulation and habitat loss.

Important port/marine structures typically have 50 to 80 years. Steel and open type structures usually require more maintenance than massive

concrete or stone construction. Therefore, long-term maintenance may be the determining factor. For proper evaluation, it is important to apply Life Cycle Management (LCM) and Whole Life Costing (WLC) techniques as provided in INA (1998) to a range of structure types and materials.

In the absence of the above-mentioned information plus adequate geotechnical information, it is premature to recommend a suitable type of structure for the quay facility.

4.2.2 **TOR 2:** Economic and Financial Analysis (Financial Modelling)

(i) Introduction

This review attempts to identify issues that a reader is likely to need clarification from the consultant, issues that need to be addressed to improve the pre-feasibility report and issues that need to be given attention in the full-scale pre-feasibility study.

(ii) Approach

The review is centred on the key inputs to a financial model for assessing an investment. Four inputs are identified as:

The **initial capital outlay** and subsequent major capital expenditure during the life of the investment. With respect to this project, a good part of this input is informed by engineering estimates.

The **estimated life of the investment** (or in more specific terms, the horizon for evaluating the investment). This can also be related to the useful life of the facility. It is also informed by the engineers' assessment and it is also going to be an input to assessing the appropriate concession arrangements.

The **estimated periodic cash-flows** – this is a net of periodic revenues and periodic operating costs – whether finite or infinite). To a large extent they are determined by the demand and delivery of the services to be provided by the facility. The organizational set up as well as external factors is also to be considered.

The **cost of capital and/or discount rate** used in the model. This extends beyond the estimated cost of funds to be used by considering the appropriate required rate of return to be used as the discount rate. This is also to be linked with the assessment of the project's risk to determine the appropriateness of employing risk-adjusted discount rate.

An assessment was made on **the underlying assumptions** for each input to the financial model and how the figures used in the financial model were arrived at. The review did not attempt re-run the financial model. However,

based on this review, the client may find it appropriate to ask the consultant to re-run the model.

(iii) A Review of the underlying Assumptions and Other General Issues

The general assumptions are clear and largely appropriate. However, it is worth noting the following:

As per General Assumption 2, only phase 1 is included in the financial model. It is worth noting that the viability of Phase I may not necessarily suggest the viability of Phase II. On one hand the investment requirements may be different. On the other hand, there may not be a business case to justify implementing Phase II based on the demand for its services and its associated revenues. In other words, Phase I may just be sufficient for the business that is available in the region. This needs clarification from the consultant.

The project's 75/25 debt/equity gearing (General Assumption 5) is assumed constant over the life of the project. However, as the debt declines through repayment and retained earnings accumulate it is obvious that the gearing will decline.

The analysis breaks the analysis horizon into two periods: up to the payback period/year (16 years) and after payback period (24 years). This presentation especially for capital expenditure has to be interpreted with care. On the one hand analyzing the facility only over a 16-year horizon is unlikely to payback the initial investment; on the other hand the cash flows in the year subsequent to the breakeven period are a result of investment made at the onset of the project.

The exclusions pointed out in the assumptions are substantial and warrant some explanations in the light of their financial implications. In a full scale pre-feasibility, the monetary magnitude of some of the exclusions has to be estimated and captured in the financial model. Such exclusions include the externality implication of diversion of existing services and likely additional costs of electronic security installation which is important for this project. Further some of the exclusions, such as re-routing of major hidden services and roads, are likely to involve negotiation with the government to meet them.

To improve readability, some contents that are currently in the annexes need to be brought into the main document and (some) in the executive summary. This includes the level of the initial outlay and the summary of the key assets of the project during the first 16 years and during the last 24 years of the project. The following summary in Table 4.1, for example, enables a reader to get a snapshot of the investment requirement.

Table 4.1. Summary of the Assets of the Project

Element	Before Payback			After Payback		
	16 Years			24 Years		
	Opening	**Addition**	**Closing**	**Opening**	**Addition**	**Closing**
Landside Improvements	4.50	0.39	4.71	3.02		2.90
Buildings	97.89	8.17	102.14	62.98		60.46
Construction-Port Facilities + Professional fee	1,621.58	130.26	1,689.44	1,049.46	4.97	1,012.25
Machinery & Equipment	187.36	28.74	191.76	384.62	65.64	393.98
Motor Vehicles	1.76	1.13	2.17	7.33	2.39	7.29
Tools & Equipment	2.01	0.33	2.05	0.30		0.26
Furniture & Fixtures	0.80	0.13	0.82	0.12		0.10
Computers & Accessories	0.80	0.13	0.82	0.12		0.10
Software	2.01	0.33	2.05	0.30		0.26
Total	**1,918.71**	**169.62**	**1,995.95**	**1,508.24**	**73.00**	**1,477.61**

(iv) A Review of the Inputs to the Financial Model

(a) Initial Investment & Capital Expenditure Assumptions

- The financial model show an opening balance of assets worth USD 1,918.71m and initial new additional investment of USD 169.62m (before the 16 year payback period). It is not clear how the initial (opening balance) was considered in the financial model. Considering that Net Cash from Operations are 257.30 and 1,271.59 before and after the 16 year payback period respectively and 1,528.90 for the 40 year concession period it unlikely this cash flow will return the financial metrics in the report (IRR, NPV and payback period) for a 40-year concession period.
- In line with (a) above, the model does not clearly show how the residual value was estimated and captured in the model.
- Harbor cranes are assumed to have useful life of 25 years while the concession is for 40 years. The analysis involves acquisition of harbor cranes only in the pre-payback period. That is, in the estimation of capital expenditure, harbor cranes appear only in before the 16th year (USD 18.56) The amount involved is substantial hence likely to affect the computed financial metrics.
- Further, some other assets (including Tools & Equipment, Furniture & Fixtures, Computers & Accessories as well as software are only considered in the pre-payback period. The depreciation

schedules also show that Furniture & Fixtures as well as Computers &Accessories do not have depreciation from year 2044 suggesting that either they are fully depreciated of are no longer recorded.

- Some additional "assumptions" that are also relevant for understanding the results of the financial model are captured in the Economic Viability and Key Figures section of the Financial Model (Page 4 of the section). These include year-on-year growth (5%), OSV capacity utilisation per call (30%), vessel call ratio (over traffic forecast) (80% maximum) and berth utilisation & time alongside (60 - 80%).

(b) To a large extent, the **estimated periodic cash-flows** are determined by the demand and delivery of the services to be provided by the facility are based on the market analysis of the services to be provided which needcritical comments from the market review.
Issues that need attention here include:

- A revision of the applicable depreciation rates as per the provision of Schedule 3 of the Income Tax Act. Table 4.2 provides a summary:

Table 4.2. Summary with Respect to Depreciation

Element	As used in the Analysis		As per 3rd Schedule of ITA		Remarks
	Rate	Basis	Rate	Basis	
Landside Improvements	4%	RBM	5%	SLM	Change Rate & method
Buildings	4%	RBM	5%	SLM	Change Rate & method
Construction-Port Facilities + Professional Fee	4%	RBM	5%	SLM	Change Rate & method
Machinery & Equipment	12.50%	RBM	25%	RBM	Change Rate
Motor Vehicles	25%	RBM	25%	RBM	OK
Tools & Equipment	12.50%	RBM	25%	RBM	Change Rate
Furniture & Fixtures	12.50%	RBM	12.5%	RBM	OK
Computers & Accessories	12.50%	RBM	37.5%	RBM	Change Rate
Software	12.50%	RBM	37.5%	RBM	Change Rate

- Consideration needs to be made on Pre-Operational Expenses

- It is unclear why the Yearly Escalation Amount is calculated based on the Accumulative Escalation % rather than the apportioned Escalation
- Large infrastructure projects often require arrangements such as off-take agreements, supply agreements, and management agreement. For this project an off take agreement with the potential users of the facility for the services the project will offer is critical in reducing uncertainty in the cash flows. It helps demonstrate that the project will be able to generate revenue and provide assurance to potential financiers of the project.

(c) The **cost of capital and/or discount rate** used in the model appears to be appropriate for the project. The cash-flows are in a stable currency (USD) and the cost of borrowing in this currency for a project nature is unlikely to be above the 8 percent used. As pointed out latter, ring-fencing the project's cash flows and other credit enhancement measures as well as the project's gearing will work to lower the overall project's cost of capital.

(v) Other Critical Issues:

(a) The consultant has identified the timing of implementation as a critical success factor of the project (Section 8.2.2). The stages outlined in the PPP Operational Guidelines (2010) as well as the need to follow procedures in the other documents (see review on concession) may introduce bureaucratic processes that can end up delaying the implementation of the project.

(b) A project of this nature requires signing agreement with **operator and off-take purchasers** for the entire of substantial part of the tenure of the concession. Off-take agreement essentially locks in sales of the services the project will generate and in doing so; the revenues for the project are guaranteed. The off-take purchase agreement has the most essential role at the outset of the project as it provides greater assurance to fund providers.

(c) So far, the operational and ownership structure is yet to be determined clearly. Typically for a project of this nature the suggested type of operation is that of having a different and independent entity with fully legal mandate-i.e. a Special Purpose Vehicle (SPV) which will run the business on commercial basis.

The idea behind the formation of an independent entity is to avoid the bureaucracy of operating public institutions especially at local levels. Mostly important, it makes ring-fencing possible ensuring that interests of fund providers and other key stakeholders are met. While

this comes later in the full scale feasibility study, it is imperative that the client has a clear position even at early stages.

(d) A caution note in relations to the existing regulations is that neither the PPP Guidelines nor the PPP Regulations provide for the formation of a special purpose vehicle/entity to operate a PPP project. There are very limited documented cases of PPP project that have gone through using the PPP Act (2010), the PPP Operational Guidelines (2010) and the PPP Regulations (2011) to serve as basis for review. Further, while the financial model assumes a project's 75/25 debt/equity gearing, division of the equity between the private and public parties is yet to be sorted out at this level.

4.2.3 TOR 3: Market Assessment

The pre-feasibility study market assessment mainly used the secondary data available from various sources. This is ok; however, the decision on market viability of the project will require the secondary data to be supplemented by primary data from key players in the project.

Comments on the Contents of the market assessment as provided in Appendix B of the pre-feasibility study report

Section	TOR 3: Market assessment
3.1	Offshore oil and gas market: This is not well presented in the pre-feasibility study. The section is supposed to give a picture of the market by providing demand and supply figures over a period of time and clearly indicate the gap to be filled under the proposed project. The report provides swiping statements on the likely future increase in the demand for gas but fails to provide the gap between the current demand and supply and projections on the future increase in demand for gas.The report also pinpoints India and china to be the possible market and generalizes on other possible markets.

3.2	**PEST analysis:** The analysis is done on political, economic, technological and social factors. The natural environment is to be included in this section. In the natural environment section analysis on the natural resources in the country, the weather and climatic conditions need to be presented. Natural environment is relevant to the proposed investment.

	Section 3.2.1: Political: This section needs to articulate laws, regulations and government policies. The awaited legislation is the oil and gas law. However, the section needs to also articulate tax policies, trade restrictions (if any) and how they are likely to pose as challenge to the proposed investment. Pressure groups need also to be discussed under this section; the proposed investment is likely to be affected by moves from pressure groups including political parties.
	Section 3.2.2: Economic: This section lacks important information on economic growth, interest rates, exchange rates and inflation. All this information has an effect on the investment decision to be made. The report pinpoints falling oil and gas prices in the world market to be the major economic risk, no trend analysis is done on prices for the oil and gas over a period of time. The section also shows the gas consumption by region but fails to show who the major suppliers of the same to these regions are. The projections indicated are up to year 2025. A period of 10 years given the heavy investment needed in gas and oil industry the projections may need to go beyond 2025 as payback period for such investments might be a little bit longer
	Section 3.2.3: Social: Public opinion and sentiments are likely to affect the proposed project. Inadequate consultative process with people who will be affected by the project is likely to be a major risk in this. Security and sabotage incidences could happen at later stages if the voices of people in the project area are not given a chance to be heard. People in the area must be involved from the exploration stage of project design. Sense of social responsibility by the investor is likely to help the project to gain support from the general public. People of Mtwara should see how the project will contribute to their welfare.
	Section 3.2.4: Technology: The content does not show any analysis on technological requirements for the proposed project. Neither the infrastructure needed to support the technology to be used in the proposed project

4.	**Competitive analysis**: This section needs to be broadened with the subtitle "key players analysis" the analysis should cover, the company, suppliers, customers, competitors and the public.
	Competitive Appraisal of Mtwara Port: This section needs to be improved. The analysis should be done on the basis of weighted important key success factors (market attractiveness factors) for the port. From this analysis one should be able to see the

	strengths and weaknesses of each port. As it is presented now (Table 4-2 to 4-7) all factors itemized in the tables have the same weight which cannot be the case for the proposed project. This subsection could actually provide Strengths, Weaknesses, Opportunities and Threats for Mtwara Port.

5	**Global offshore support fleet analysis:** This section could also be broadened with the subtitle **"Quantitative** analysis" which could show global and domestic market trends. The analysis should include the market size, projections on market share, revenue projections and gross profit or profit margins for the proposed project over a specified period of time. This information is important for one to be able to justify the market viability of the proposed project.
	Section 5.1:Current fleet analysis: The global trend on the size and type of the fleet is ok although information on other factors that influence the choice of the vessel size and type of the vessel could add value and inform the project on the appropriate vessel for the Mtwara proposed project.
	Section 5.2:Predicted Global Offshore Supply Vessel Fleet: The trend for the size of the OSV provided covers the period up to 2010 but is not used to predict the appropriate OSV size for the proposed project. The report further suggest that the economies of large scale production can be achieved by deploying large sized vessels however doubts on the applicability of large sized vessels in East African markets. At feasibility study stage this will need to be worked out by articulating analysis on the demand for the gas, supply capacity and the vessels size since economies of scale achieved from use of largest sized vessels will improve competitiveness of the gas supplied from Mtwara.
	Section 5.3Establishing Berth Requirements: the section provides global analysis on the global OSV fleet and berths requirements, this is ok however, and this information needs to be inferred to the Mtwara port for the proposed project. It should show projections on the OSV fleet to be accommodated and the required berths.
6.	**Mtwara Traffic Forecast**
	Section 6.1.1:Offshore Supply Vessel Calls: From the market point of view generally, this is ok however; reasons for decline in the deep sea and coastal vessel calls in year 2012/2013 and supply vessel calls in 2013/14 should be provided. This can give the reader a picture of whether the decline is short term or is likely

	to continue in future. There is also a need to provide possible cause of the situation
	Section 6.2Traffic Forecast Activity at Mtwara: At the moment the information provided is very shallow. It does not reflect the expected business volume. The section pinpoints a number of risks and suggests ways to overcome. The risk management/mitigating strategy provided are not convincing. For example, recovery on the global oil and gas price is very subjective; equally, introduction of clear regulatory structure for investment in offshore gas extraction in Tanzania is subjective. The potential traffic demand will need to be substantiated at the feasibility stage by data from actual and potential customers. Generally, the traffic forecast for Mtwara port is based on assumptions with uncertainties for the market and timing of demand for the additional Offshore Supply Base quayside handling capacity. The nature of the proposed project entails heavy capital investment hence the need for evidence based decisions. At the feasibility study more data will need to be generated to benchmark the forecast and reduce the uncertainty.
	Section 6.3: Revenue forecast: The forecasted Revenues are based on uncompetitive facility fees (berths utilization fees, rental fees and service Fees). The fees are higher than those charged by other facilities worldwide including TPA. The proposed fees could de-market the Offshore Oil and Gas Supply Bases services. The projected revenues are also based on traffic forecast which are based on assumptions and uncertainties. Generally, there are far from reality and will need to be substantiated in the feasibility study with appropriate data
7.	**Offshore Supply Base Operations** - Case Studies: the cases are ok and should be used evaluated and finally guide decision on the nature of relationship between Mtwara Port and the Offshore Oil and Gas Supply Bases.
8.	**Conclusion:** Ok as it highlights positive aspects in relation to the proposed Offshore Oil and Gas Supply Bases. However, as part of the conclusion there was a need to pinpoint the need for data to support forecasts

4.2.4 TOR 4:Traffic Forecast

(i) Introduction

Successful management of any sea port facility depends primarily on the harmonisation of traffic supply and demand, whereas their incompatibility leads to a number of problems. When the demand for port services exceeds the supply, there comes to congestion of port facilities, an increase in costs of ships and losses of time due to waiting. Since the traffic supply is not flexible and its construction and development require substantial financial resources in order to be payable, supply must be designed in accordance with the anticipated demand in the future. Therefore, in order to avoid the consequences of non-compliance of port supply and demand, and to create a basis for sizing supply, there is a need for traffic forecasting for port services. Since the port service cannot be stored, the port supply needs to be in line with the anticipated demand.

Traffic forecasts are used as a basis for investment planning and design of port projects (ports, quay, shore protection, etc.). The size and the quality of these investments depend on the handled traffic. They are also used for the day-by-day management (plan loading and unloading, equipment to be assigned and so on).

There are various methods for traffic forecasting and those can be broadly classified as:

(a) **Casual models**: these methods assume that the traffic will depend on the behaviour of other variables like trade, GDP etc., called independent variables. The purpose of casual models is to find the relationship between the variables in the form of statistical equations or curves and then use them for forecast. These kinds of models are only appropriate up to medium term forecasting. They do not consider the various exogenous variables that affect the port demand.

(b) **Non-casual models**: these are various non-casual techniques available in the statistics and they can be applied on the basis of behaviour of past data.

(c) **Subjective or judgmental models**: these are generally used for traffic forecasting for long term planning since they require the policy and planning implication in forecasting. They are generally applied when either historical data are not reliable or direct empirical relationship among dependent and independent variables are not fitted. To use this technique, one needs to apply some judgmental value for technology forecasting, policy and planning level decisions in the parameters. The qualitative models have been generally applied for long term planning.

Time series models exist in a wide range, from simple growth factor models to complex Autoregressive Moving Average models (ARMA). However, the

latter model is mainly suitable for short-term forecasting. Therefore, time series models with an explanatory variable, i.e. a transport multiplier, are used more often. This is not the same as a regression analysis with explanatory variables. Because here a trend of a particular explanatory variable is described, while in the latter a certain value is forecasted and used in a regression model. A traffic multiplier can be based on a lot of different data, like growth in sales, gross domestic product (GDP) or stock market analysis. Although time series models have the advantage that they require only a few data, there are also some drawbacks. Because the forecast is based on only one variable (or a historical trend), no insight is gained in other events or variables that can affect the throughput volumes in a particular port, i.e., policy effects. These insights can be of great value to understand the trend that is forecasted. In contrast with this, the literature also suggests that in making forecasts it can be dangerous to put in many variables containing more details to make the model "better", a failure called false reduction. This is because the more variables included in a forecasting model, the more uncertainty there is about the validity of the model. This is particularly the case in cause-and-effect models. Forecast models that rely only on trend forecasts do not account for shocks in the economy that might affects throughput of specific types of cargo. Therefore, it is important to establish models that suit one type of cargo instead of all freight throughput in a port.

A good cargo forecasting method has several characteristics. First, in the maritime industry data is often not available in large quantities and detail. This makes it better to use a model that does not require a lot of data. Also, because using a lot of different data makes the forecasts less reliable, since it is more prone to error. Second, the model should make clear how traffic flows are generated. This is based on information about supply and demand in different regions. Based on this information, supply and demand (or production and consumption) regions are linked to each other to show how these trade flows are distributed over the world. Here, macroeconomic variables are used to forecast freight flows. Third, factors that determine the competitiveness of a port have to be taken into account. Because not only the existence of trade explains the cargo throughput in ports but also the attractiveness of the port. This is because many ports in the world serve the same hinterland and port specific characteristics determine which port gets the biggest share of the trade flow that is destined for this hinterland. Finally, preferably the model accounts for shocks in the economy and trends and developments in the industry. Literature has shown that this is very difficult to include in a mathematical model. Therefore, it is also possible to analyse and – if it is desired - adjust the results of quantitative models by use of expert judgment on these trends and shocks.

(ii) Information and acquired data

As mentioned in Chapter 5 Section 5.2 of the Feasibility Report, historic data of vessel traffic for the period 2006 to 2013 was used for traffic forecast. The data was provided by TPA and is shown in Table 6.1 in Appendix B: Market Assessment Report. Sub-section 5.3.2 shows a snapshot of vessel calls data evaluated over a period of eight weeks at the existing port at Mtwara, which is shown in the Market Assessment Report in Tables 6.2 and 6.3.Additionally, in the Market Assessment Report (Chapter 1), it is stated that projections of future cargo tonnage and vessel movements will be prepared, that will inform the master planning/phasing of the development of the proposed facility.

(iii) Traffic forecasting

Forecast Assumptions

The Market Assessment Report indicates that traffic forecasts have been based on a number of assumptions which will require verification with end-users during the next stage of feasibility assessment. As shown in Tables 6.4 and 6.5 of the report, the assumptions made are on the timing (initial exploration, initial construction, initial production and future phases) and scale of the development of the Tanzanian offshore gas sector (during exploration-9.2 OSV calls per day, quadrupling of the OSVs during construction and reduction below the construction period during production phase). It is not clearly indicated how the risks associated with the assumptions made were evaluated in the traffic forecasts.

Predicted Global Offshore Vessel Activities

In the Market Assessment Report (Section 5.2), the pre-feasibility study indicates that the rate of increase in OSV vessels is estimated to be around 2.5% to 3% per annum, which according to Ocean Shipping Consultants is based on an oil production increase of 55% by 2025 to 36 m bbls/d and a gas increase of 22% to over 1,000 bcm/yr.

Predicted Vessel Calls at Mtwara Port

In the Market Assessment Report, Sub-section 6.2.1 Tables 6.4, 6.5 and 6.6 outline the basis of Mtwara port traffic forecast from present year through the exploration, construction and production phases as well as future development phase. As outlined, an average 9.2 vessel calls per week benchmarked to current (FY12-FY14) Mtwara port OSV calls and related DSV calls is assumed for the future traffic for the current programme from FY15 to FY 18 and FY31 to FY35 for future development phase, during the

exploration phase period. Activity levels during the construction phase are assumed to increase 4 times higher than Exploration Phase activity levels for the current programme (FY18-FY21) and for the future development phase (FY34-FY37). During production phase, activity levels are assumed to reduce to 2/3rd of Construction Phase activity levels for the current programme (FY21 onwards) and for the future development phase (FY37 onwards).

Projections of Future Cargo Tonnage

Section 1 of the Market Assessment Report under 'traffic forecast' indicates that projections of future cargo tonnage will be prepared to inform the master planning/ phasing of the development of the proposed facility. However, the projections are not given in the report and it is not explained who should prepare them.

The Forecast Model

The main report of the pre-feasibility study states clearly in Chapter 5 Section 5.2 that the traffic forecast model is presented in further details in the Market Assessment Report Section 6. However, a thorough review of the Market Assessment Report reveals no forecast model presented as purported in the main report. Moreover, it appears that traffic predictions from FY34 onwards used projection factors other than those outlined in the Market Assessment Report Sub-section 6.2.1.

However, a critical review of the methodological approach of the traffic forecast outlined in the Market Assessment Report indicates that the feasibility study undertook a two-step process in the traffic forecast. Step one involved forecast of vessel calls (FY15 to FY 35) using a projection factor 9.2 and other assumptions made as obtained from predicted vessel calls at Mtwara port (see 8.4.1.2 above), whereas step two involved forecast of traffic activities using projection factors outlined in Section 5.2, as reviewed in section 8.4.1.1 above.

(iv) Application of forecasts in port planning and market assessment

The main report indicates that the contribution of the traffic forecast to the port planning and during the period of development is outlined in Section 5.4 of the report. Section 5.4.1 outlines the number of berth requirements based on the vessel traffic forecast outlined in the Market Assessment Report (Section 6). The vessel traffic based on number of ship calls per day per vessel type was converted to estimate the number of berths required. It appears that OSVs from the Table 6.6 were converted to ship calls per day shown in Table 5.6. However, Table 6.6 gives forecast of OSVs up to FY60, while Table 5.6 presents ship calls per day until FY67.

In the revenue forecast (Section 6.3) of the Market Assessment Report, it is indicated that berth utilization charges/fees were generated from the OSVs and cargo vessels.

4.2.5 TOR 5:Concession Strategy

A Review of the Appropriate Concession Arrangement

The consultant's report does not explicitly cover concession; it only comes out in relation to the costs and revenues implication. Concession is broadly defined as an arrangement whereby a government or other public sector body contracts with a private operator to develop (or upgrade), operate and maintain infrastructure assets for providing (producing) public or commercial good or service. From project's perspective, the key characteristics related to concession are **thetype of project service(s)**; the extent the project involves **investment in fixed assets, the pricing policy** for the project's output (goods and/or services) and **the need for private financing**.

In this review, the focus is on identification of possible concession arrangement for this type of activity, assessing each (its costs and benefits in the broad sense) and making a recommendation on the most appropriate. Application of existing laws including the Public-Private Partnership Act and its regulations will be considered.

The nature of the proposed **Mtwara Common User Quay Facility Project** for oil gas supply base makes it fall in the public private partnership (PPP) category of projects. The PPP models applicable to this type can be clustered in four broad categories: Integrated outsourcing with or without finance, operating concession, general concession and institutional public private partnership.

The PPP models are differentiated by the contract type amenable to each, the tenure (time horizon) and the nature of the ownership of the assets. Further, the commercial (or otherwise) nature of the services generated by the project is also a differentiating factor. Commonly used contract types, albeit with different forms of contracts, are: Build, Operate, and Transfer (BOT); Build, Transfer and Operate (BTO); Build, Own, Operate, and Transfer (BOOT); and Build, Operate, and Own (BOO). Others are Design-Build-Finance-Maintain (DBFM), Design-Build-Finance-Maintain-Operate (DBFMO) and Design-Build-Operate (DBO).

- In BOT framework (with its build-transfer-operate [BTO] and build-lease-transfer [BLT] variants), the public delegates planning and realization of the project as well as operating management of the facility for an agreed period of time to the private party. The private party is not the owner, but during the agreed period is entitled to retain all receipts generated by the operation. At the end of the period, the facility will be

transferred to the public without any payment being due to the private party involved.

- BOOT framework differs from BOT framework in that the private party owns the facilities during the concession period. At the end of the concession term the facility is transferred to the public administration, and, often, a payment for it can be established.
- BOO framework has characteristics in common with BOT and BOOT. The private party owns the facilities (as in the BOOT case), but ownership is not transferred at the end of the concession agreement. Therefore the residual value of the project is exploited entirely by the private sector.
- DBFM, DBFMO and DBO can be clustered together since they have design element with or without finance.

In summary, the typical **features of the PPP models relevant for the proposed project** are as follows:

(i). An**integrated outsourcing with finance** is mostly in the form of DBFM, DBFMO, BOT, BOOT, BTO, and BLT contract types. The tenure is 10-15 years with public ownership of the assets

(ii). An **operating concession** has the assets being owned by the public with 10-15 years of leas/concession contract type.

(iii). A **general concession** has a time horizon of 20 to 30 years with public or private ownership of the asset. However, at the expiration of the tenure the assets are transferred to the public. The relevant contract types here are BOT, BOOT, BTO, and BLT. The key difference between a general concession and operating concession is that in the former, the concession holder sells its services directly to the end-user of the services and assumes the commercial risk – which is not the case with the later.

(iv). An **institutional PPP** has a joint venture contract type and lasts in perpetuity or for a fixed duration. With a fixed duration the ownership of the assets is transferred to the public while for a perpetual horizon the assets remain with the joint venture which is private-public owned. To facilitate financing arrangements, the contract type in an institutional PPP is usually structured around a special purpose vehicle (SPV) meaning that the ownership of the assets is typical public/private. That is the ownership is derived from the ownership and capital structure of the SPV.

In making recommendation on the appropriate concession arrangement appropriate for the proposed project, the review took into consideration legislations and regulations in place in Tanzania. These are the National Public Private Partnership (PPP) Policy (2009), the Public Private Partnership

(PPP) Act (2010), as well as the PPP Operational Guidelines for Tanzania Mainland (2010) and PPP Regulations (2011). That is, the proposed **Mtwara Common User Quay Facility Project** should follow pronouncements and guidelines in these documents.

Among other things, the PPP Operational Guidelines (2010) offers well detailed guidelines in relation to processes, operational recommendations, tools and documentation applicable in different stages of projects of this nature. The stages are initial project selection, pre-feasibility study, feasibility study, final approvals, procurement and contracting as well as implementation.

With respect to the characteristics of a project, the proposed **Mtwara Common User Quay Facility Project** for oil gas supply base:

- is going to provide commercial service using public property (the "public" here relates to the fact that the land on which it is going to be constructed has some public ownership and TPA is a public entity)
- requires heavy investment in the construction of the facility;
- is to operate in a manner such that the costs are going to be fully recovered through user fees,
- requires private financing and without such funding the project is unlikely to be implemented;

Based on these characteristics, the applicable PPP model is the general concession model – with its BOT, BOOT, BTO, and BLT contract types[1].

- The long term nature of the project and the importance of the underlying land makes the build, operate own (BOO) model unlikely for the interest of the public. This is because it does not transfer the ownership back to the public. Essentially, BOO gives the owners (private or public/public) unlimited ownership and use of the facilities underlying project.
- The appeal of the build-operate-and-transfer (BOT) framework to the private investors in this project is limited. This is because it does not give ownership during the concession period. The appeal can, however, be enhanced through inclusion of mechanisms for monitoring during the concession period.
- The build-own-operate-and-transfer (BOOT) is likely to give investors more confidence especially in ring fencing the cash-flows. The land tenure laws; however, risks leaving out the public counterpart in monitoring the quality of the assets considering that the public has vested interest in the residual value at the end of the concession period.

[1]This is largely informed by the PPP Types Selection Tool in the PPP Operational Guidelines for Tanzania Mainland (2010)

- The build-lease-transfer [BLT] framework is a compromise between BOT and BOOT but it works only where the government has financial muscle to fund the construction.

5. CONCLUSION AND RECOMMENDATIONS

TOR 1: Concept Design

The consultant for the pre-feasibility study had used scanty information for the choice of the concept design. This is evidenced on page 78 where there is a caveat, "Importantly, the preferred deck on pile design could change if new geotechnical information reveals that trenchingor dredging of the rock is feasible. This would make caisson or counter fort units possible (the trenching option) or,less likely, make it possible to position the quay closer to the existing shoreline and dredging the area landwardsof the -10m contour to allow the safe passage of vessels. This would greatly reduce the reclamation extent (andcost) necessary to link the land to a quay positioned a few hundred meters offshore".

In addition, for proper evaluation and choice of the concept design, it is important to consider important factors that affect the relative cost of structure types.The factors include availability of construction materials, labour and the accessibility of construction equipment, local construction practices, environmental and regulatory concerns over water circulation and habitat loss. The final choice would be reached having applied Life Cycle Management (LCM) and Whole Life Costing (WLC) technique as provided in INA (1998) to a range of structure types and materials.

In the absence of the above-mentioned information plus adequate geotechnical information, it was premature to recommend a suitable type of structure for the quay facility.

TOR 2: The Financial Model

The financial model in the report is at very early stage and only provides basic outlook of the economic and financial viability of the **proposed Mtwara Common User Quay Facility Project for Oil Gas Supply Base**. As noted in the supplementary notes "… [Themodel] has been developed for the purpose of sensitivity testing and to provide and [sic] baseline for adjustments and future assumptions". The report is clear about the depth of the contents of the model by giving a caveat that ***"… [The] model should not be relied upon for budget or business case purposes".***

TOR 3: Market Assessment

- At this stage (prefeasibility study) the information provided in the report is enough; however, the consultant needs to synthesize data requirements to be addressed in the feasibility study.

- Industry analysis needs to be comprehensive enough, entry barriers should be identified, information on whether the industry is growing or not, current trends in the industry and the analysis should show if the project is sensitive to economic fluctuations. Trends and projections should be done in a very precise manner for one to be able to determine the viability of the proposed project
- There is a need to identify key success/ market attractiveness factors for the Offshore Oil and Gas Supply Bases and assign weights to each factor to be used in conducting competitive analysis for the different ports

The fees (berth utilization, rental fees and service charge) should be based on existing pricing models and pricing objectives should be well stipulated.

TOR 4: Traffic Forecast

In view of the foregoing review and discussion, it can be concluded that:

- A thorough review of the Market Assessment Report reveals no forecast model is presented as purported in the main report, instead traffic forecasts are presented.
- The methodology for forecasting of traffic uses two different data to forecast traffic; step one involved forecast of vessel calls (FY15 to FY 35) using a projection factor of 9.2 and other assumptions made as obtained from predicted vessel calls at Mtwara port (see 8.4.1.2 above), whereas step two involved forecast of traffic activities using rate of increases in the OSVs as projected by Ocean Shipping Consultants (see 8.4.1.1 above). This approach is prone to errors in the forecasts noting that there was no reliability tests of model that were done.
- It is not clearly indicated how the risks associated with the assumptions made were evaluated in traffic forecasting.
- Future cargo tonnage are not given in the report as purported by the Market Assessment Report, and their use is not clearly explained.
- It appears that OSVs from the Table 6.6 were converted to ship calls per day shown in Table 5.6. However, Table 6.6 gives forecast of OSVs up to FY60, while Table 5.6 presents ship calls per day until FY67.

TOR 5: Concession Strategy

Based on the above analysis, the **build-own-operate-and-transfer (BOOT)** is recommended. Monitoring mechanisms need to be in place to ensure the quality of the assets agreed by the parties is upheld from construction to the end of the concession period.

6. REFERENCES

(i) John W. Gaythwaite. Design of Marine Facilities for the Berthing, Mooring and Repair of Vessels, 2nd Ed., ASCE Press, 2004

(ii) Gregory P. Tsinker (Ed.) Port Engineering – Planning, Construction, Maintenance and Security, John Wiley and Sons Inc., 2004.

(iii) Hans Agerschou et al. Planning and Design of Ports and Marine Terminals, 2nd Ed., Thomas Telford 2004.

(iv) International Navigation Association (1998). Life Cycle Management of Port Structures: General Principles. Report of WG 31, PTC II, Supplement to Bulletin 99.

(v) "Meteorological and Oceanographic Design Data Package for Mnazi Bay (MET-OCEAN) Location for Artumas Mnazi – Mtwara GTP (December 2005 -February 2006)".

(vi) Dubi, A.M. (2001). "Frequency and long-term distribution of coastal winds of Tanzania". In Richmond M. D. and J. Francis (Editors), 2001. Marine Science Development in Tanzania and Eastern Africa. Proceedings of the 20th Anniversary Conference on Advances in Marine Science in Tanzania, 28 June-1 July 1999, Zanzibar, Tanzania. IMS/WIOMSA. p. 131-144.

(vii) Bankes, S. (1993). Exploratory modeling for policy analysis. Operations Research, 41(3), 435-449.

(viii) De Jong, G., Gunn, H., & Walker, W. (2004). National and international freight transport models: An overview and ideas for future development. Transport Reviews, 24(1), 103-124.

(ix) Gosasang, V., Chandraprakaikul, W., & Kiattisin, S. (2010, June). An Application of Neural Networks for Forecasting Container Throughput at Bangkok Port. In Proceedings of the World Congress on Engineering (Vol. 1).

(x) De Langen, P. W., Van Meijeren, J., & Tavasszy, L. A. (2012b). Combining Models and Commodity Chain Research for Making Long-Term Projections of Port Throughput: an Application to the Hamburg-Le Havre Range. European Journal of Transport & Infrastructure Research, 12(3).

(xi) Pre-feasibility Study: Main Report and Financial Model

(xii) United Republic of Tanzania (2009). National Public Private Partnership (PPP) Policy

(xiii) United Republic of Tanzania (2010).Public Private Partnership (PPP) Act.

(xiv) United Republic of Tanzania (2010).PPP Operational Guidelines for Tanzania Mainland
(xv) United Republic of Tanzania (2011).PPP Regulations
(xvi) Chernev, A (2008): Marketing Strategic analysis, Amazon
(xvii) Business insights (2012): Strategic Business Plan and Market Assessment, Business Resource Software, Inc.
(xviii) Kotler (2007) Marketing Management, PH, Inc.
(xix) Ofgem (2014) State of the market Assessment, Ofgem
(xx) Oregon state University (2008): Tool for Rapid Market assessment