

11 COST BENEFIT ANALYSIS

This section is equivalent to Section xii, resource evaluation or cost benefit analysis, of the legislative structure. If in doubt, please refer to [Table 1.5-1 Environmental Impact Statement Structure](#) on page 1-5.

11.1 Introduction

This section was developed before finalisation of the Host Government Agreement (HGA) between the Government of Tanzania and the project. The HGA is needed to inform the final investment decision (FID). A positive FID will be taken only if the project will provide a positive return on investment and if it has a positive economic benefit to all stakeholders.

The costs and benefits of the EACOP project, for the most part, are synonymous with the impacts (negative and positive) that have been described and assessed throughout [Section 8](#) and are summarised in [Section 12](#). This section aggregates the costs and benefits and describes the following:

- costs:
 - project investment
 - environment
 - socio-economic
- benefits:
 - income
 - environment
 - socio-economic.

The main benefit of constructing a pipeline to transport 216,000 barrels of oil per day to the world market is the creation of considerable cashflow to the oil-producing country of Uganda. This cash flow will enhance regional economic activity, creating a positive effect in East Africa. The EACOP project will also generate income for the transit country Tanzania. The value of the income will depend on the commercial terms (oil tariff and transportation agreement) to be finalised between Uganda, Tanzania and investors.

The monetary estimates provided in this section need to be considered preliminary and reflect the current level of project development, but there are well-developed project documents, including the HGA, as well as engineering and costs substantiated by not yet binding offers of the contractors that are subject to the final negotiations to be held at FID.

11.2 Costs

11.2.1 Project Investment

11.2.1.1 Capital

EACOP capital investment costs are based on:

- construction of a pipeline, marine facilities and its associated aboveground infrastructure, including pumping stations, pressure reduction stations, electric substations and block valves
- construction of facilities that support construction, including camps, pipe yards, the coating plant and access roads, and logistical infrastructure improvements
- associated studies such as environmental and social baseline and impact studies, land surveys, water and soil investigations, and geological, geotechnical and geophysical surveys.

The estimated capital investment in Tanzania is USD 3 billion, (TZS 6.8 trillion)¹.

In addition to capital investment costs, the project will have costs associated with compensating the approximately 9500 Tanzanian project-affected people (PAP). At the time of writing this ESIA, the land acquisition and resettlement process is not yet fully complete.

The resettlement action plan (RAP) conforms to Tanzanian law, international best practice and IFC principles. All PAPs will receive fair compensation; the compensation will consist of both cash and in kind, fully in line with the best international practice; houses will be reconstructed on other land parcels in agreement with the PAPs. Based on the currently available estimate, subject to final approval of the valuation reports and signing of the agreements with PAPs, the overall budget to implement the RAP is in excess of USD 100 million. It includes both cash and in-kind compensation, and services required by specialised contractors to implement this activity. PAPs will be resettled in conditions the same or better than before.

11.2.1.2 Operational Expenses

During operation in Tanzania the EACOP project will spend approximately USD 90 million (TZS 205.4 billion) per year.

11.2.2 Environment

The pipeline route passes mainly through modified habitats, interspersed with some natural habitat, both terrestrial and aquatic. Impacted natural habitat is mainly outside of protected areas, with some exceptions where the pipeline traverses protected areas.

The pipeline will be buried and the surface fully reinstated after construction. Only the planting of deep-rooted trees and the construction of structures will not be permitted. The costs associated with reinstating the pipeline right-of-way (RoW) are

¹ All EACOP-related values are in 2016 terms and based on the exchange rate on 24/08/2018 of TZS 2276.2 to USD 1.

project costs that are not segregated as environment impact mitigation costs. This is in line with best international practice and supports the best long-term environmental mitigation.

Environmental costs can be considered in terms of negative and positive impacts, and whether the negative impacts are mitigatable and the costs of mitigating the impacts are reasonable. As documented in [Section 8](#) and summarised in [Section 12](#), there are negative and positive environmental impacts. However, most impacts can be managed and mitigated, the management plans are documented in [Section 8](#) and mitigative measures described in [Appendix E4](#), environmental and social management plan.

Estimating the financial costs associated with biodiversity loss or disturbances and other environmental components (e.g., landscape) is challenging, as there are no standard criteria for their monetisation. For the purpose of this cost benefit analysis, the environmental costs considered are those associated with mitigating and monitoring impacts. The costs, which can be also considered project investment, for mitigating the negative impacts through design and engineering (e.g., horizontal directional drilling, pollution prevention and waste management) are estimated to be approximately USD 32 million (TZS 72.7 billion). Approximately USD 1.9 million per year (TZS 4.3 billion) is estimated for other environmental management and mitigative measures (e.g., biodiversity conservation, environmental equipment maintenance and waste management). The cost to implement the environmental monitoring plan is estimated to be approximately USD 3.8 million (TZS 8.6 billion). These costs are based on current engineering and design and subject to adjustment.

11.2.3 Socio-economic

11.2.3.1 Individual PAPs

As mentioned in relation to project costs in [Section 11.2.1](#), there are approximately 9500 PAPs along the project route. Some will lose land to the project, others will lose other types of assets such as crops, economic trees and structures, and some will be physically displaced, i.e., will lose residential structures. Furthermore, displacement of people will affect their livelihoods. The project will compensate for the land, buildings, crops and trees, loss of profit and other compensable costs such as graves. In addition, the project will provide livelihood restoration for qualifying PAPs as per the IFC performance standards.

[Sections 8.12](#), Local Economy, to [8.19](#), Community Safety, Security and Welfare, describe the predicted project socio-economic impacts and planned management plans, and [Appendix E4](#) describes the mitigation measures.

Pipeline construction activities will bring opportunities for Tanzanians: all casual workers will be employed locally. PAPs will have an opportunity to provide services to the project, and will receive, where required, basic training.

11.2.3.2 Communities

The project is predicted to impact communities along the RoW. The related costs may be associated with the increased number of immigrants, increased cost of

living due to increased income, additional health bills due to a potential increase in communicable diseases, and alteration of social fabric, e.g., broken marriages. For the purposes of this cost benefit analysis, estimating the financial costs associated with costs to communities is challenging. As pre- and post-mitigation impacts can be reviewed in [Section 8](#), for cost benefit analysis purposes the focus will be on related and estimated mitigation and monitoring costs. Community-related impact management and mitigation includes:

- the community health, safety and security plan
- the project induced in-migration management plan
- the stakeholder engagement plan.

The cost, also a type of project investment, for managing and mitigating community impacts is estimated to be approximately USD 8.6 million (TZS 19.5 billion).

The project will install a fibre-optic cable along the pipeline route. Part of the cable's capacity will be dedicated to providing internet access to the local population. Government and several mobile operators are in discussions with the EACOP project to implement this high-speed internet connection. All costs for the fibre-optic cable along the pipeline will be paid by the project. Local operators and government will be required to cover the cost of connecting to the EACOP fibre-optic cable.

The anticipated impact on communities is expected to be mitigated by the increased level in economic activity from the pipeline construction. These costs are based on current engineering and design and are subject to change.

11.2.3.3 Government

The costs to government include:

- time and expenses for the negotiation of the project agreements
- monitoring implementation
- attending bilateral meetings with their Ugandan counterparts
- lease of project land over the entire project life
- developing and implementing programmes meant to manage impacts associated with project induced in-migration.

These costs are currently not quantifiable, but the main costs are expected to be associated with the salaries of government agents with pipeline-related responsibilities. This will correspond to the increased economic activity related to the project.

Other than salary, the project will compensate at cost in compliance with rules on direct expenses related to participation of the government officials in meetings and negotiations.

11.3 Benefits

11.3.1 Environment

Pipelines are the safest means of moving large volumes of liquids. Transporting petroleum products via a pipeline carries much less environmental risk than transportation by trucks or rail.

The permanent change of land use on the segments of the RoW from crop land to grassland in agricultural areas, will have a direct biodiversity benefit.

Overall, the project does not represent a substantial source of greenhouse gas emissions. If congestion that could be caused by transporting products by teams of traditional tanker trucks is prevented and the tons of associated byproducts of internal combustion are not emitted, the pipeline will produce a net air quality benefit.

11.3.1.1 Socio-economic

In terms of socio-economic benefits, the project is expected to:

- contribute to the economy (income)
- provide business opportunities for different sectors of the economy and enhance the capacities of local companies
- provide employment, knowledge transfer and skills development opportunities during construction and operation.

These benefits are described in [Section 8.11](#). An associated consideration is that the project will provide some infrastructure that may support and enhance the development of Tanzanian oil and gas reserves.

Approximate quantities of the materials, equipment and workhours required for construction of the EACOP project in Tanzania are listed in Table 11.3-1 and Table 11.3-2.

Table 11.3-1 Project Construction Material and Equipment

Material/Equipment	Tanzania
Main construction equipment (ea.) (excavators, rollers, bulldozers, trenchers, bending machines, large equipment)	440
Earthworks (m ³)	3,760,000
Trenching and backfilling/excavation (m ³)	4,247,500
Concrete placing and coating (m ³) (for valve vaults and for concrete weight coating)	60,800
Fencing and gates (m)	18,200
Pipes, joints, welding and nondestructive testing (NDT) (ea.)	64,000
Field joints (m ³)	5,000
Heat tracing cable pulling (km)	3,441
Substation construction (block valves and electric substations) (ea.)	60

Table 11.3-1 Project Construction Material and Equipment

Material/Equipment	Tanzania
High-voltage (HV) 3c and fibre-optic cable laying (km)	4,270
Personnel to transport	2,000
Pipeline construction truck loads	8,500
Other construction truck loads	800
Camps/pipe yards – pipeline and aboveground installations (ea.)	18
Building construction (m ²)	220
Building erection on-site (m ²)	6,300
Building prefabricated modules erection (ea.)	132
Steel structures (t)	44,800
Main piping (m)	20,000
Valves and fittings (ea.)	7,050
Process and utilities equipment (ea.)	1,350
Electrical and instrumentation equipment (ea.)	1,350

Table 11.3-2 Estimate Direct Construction Workhours

Discipline	Total Work Hours, Tanzania
Civil works	1,714,000
Pipeline installation	1,900,000
Pipeline welding and NDT	930,000
Field joints	464,000
Mechanical and piping	798,000
Electrical and instrumentation	484,000
Painting and scaffolding	36,000
Construction support services	7,196,000
Total	13,522,000

11.3.1.2 National

The national socio-economic benefits are summarised and re-presented from [Section 8.11](#) in Table 11.3-3. Principally, the construction contribution to the national economy over the three-year construction period is USD 3 billion (TZS 6.9 trillion) and the operation contribution per year is USD 90 million direct and USD 150 million indirect and induced (TZS 548 billion).

Table 11.3-3 Project Annual Economic Benefits

Benefit	Construction (During the First Three Years)	Operation (After Three Years of Construction)
Employment	21,000 direct, indirect or induced jobs USD 26 million (TZS 59.4 billion)	2255 direct, indirect or induced jobs USD 2.8 million (TZS 6.4 billion)
Provision of goods and services	USD 379 million (TZS 865 billion, direct) USD 613 million (TZS 1.4 trillion) (indirect and induced)	USD 90 million USD 150 million (indirect and induced)
Revenue		
Contribution to national economy	USD 1 billion (TZS 2.3 trillion) 2.1% of 2015 GDP	USD 240 million (TZS 548 billion) 0.5% of 2015 GDP
Changes to fiscal balance	USD 1 million (TZS 2.3 billion)	Positive (taxes and equity partnership)

11.3.1.3 Local

While the employment income summarised in Table 11.3-3 informs national benefits, the employment benefits will be manifested and experienced primarily at the local level. The employment benefit is expected to lead to an increase in household income and an improvement in living standards.

Some 4000 direct construction jobs or more may be generated in Tanzania over the three-year construction phase, of which 3600 may be skilled and semiskilled and 400 unskilled. Based on local content requirements, approximately 2400 workers (60% of the workforce) will be nationals, while up to 1600 (40% of the workforce) may be foreign workers. Also estimated are approximately 18,700 indirect and induced short-term employment opportunities during construction. The project may, therefore, generate over the three-year construction period, household income of USD 72 million (TZS 178 billion). People who have employment benefit directly or indirectly from the project also support about 4.7 persons, which translates into 78,100 dependants.

During operation, the project will generate an estimated 2255 direct, indirect or induced jobs, which will, in turn, generate an income of USD 2.8 million (TZS 6.4 billion).

11.4 Analysis

Based on the project cost aspects that can be monetised, the project has the potential to provide substantial benefits to Tanzania, nationally and locally, and for many stakeholders by improving their standard of living. There will be costs in terms of impacts, environmental and social that are challenging to monetise; however, the

project has management plans with mitigative measures funded by project investment to minimise those costs.

Generally, given the relatively few and manageable residual impacts that will be mitigated to a minimum, as much as feasible, and considering the relatively long 1147-km footprint, the overall project benefits, including those for the regional economy, are considered to outweigh the costs.

This is apart from the benefit of the pipeline business income provided to shareholders including the Government of Tanzania and taxes generated. Overall, EACOP income is expected to be USD 12.77 per barrel at plateau (216,000 barrels per day); with 80% of the pipeline length in Tanzania, most of this will be generated in Tanzania.