THE WORLD BANK/IFC/M.I.G.A.

OFFICE MEMORANDUM

DATE: July 18, 1995

TO: Mr. Ernst-Gunther Broder, Chairman, The Inspection Panel

FROM: Gautam S. Kaji, Acting President, EXC

Approved by: _____
Gautam S. Kaji
Date: _____

EXTENSION: 81384

SUBJECT: **Tanzania - Power VI Project (Credit 2489-TA)**
Management Response to Request for Inspection

1. Reference is made to the Memorandum, dated June 16, 1995, to the President of International Development Association (IDA), by which the Chairman of the Inspection Panel requested IDA Management to provide the Panel with written evidence that it has complied, or intends to comply, with the relevant policies and procedures in the implementation of the above-captioned Project.

2. While the Panel requests IDA Management's statement on the merits of the Request, it is the view of IDA's Management that: (a) the Request does not meet all the eligibility requirements set forth in Resolution No. IDA 93-6, dated September 22, 1993 (hereinafter "the Resolution"), and (b) one of the allegations in the Request is not admissible under the Resolution. This response therefore deals with those issues. For your *information*, attached hereto is an Annex commenting on the specific alleged violations by the Management of IDA's policies and procedures.

Eligibility of the Requesters:

3. In accordance with paragraph 12 of the Resolution, the Panel shall receive requests from an affected party in the territory of the borrower who is not a single individual (i.e. a community of persons such as an organization, association, society or other grouping of individuals), or by the local representative of such party. Any such representative must present written evidence to the Panel that he is acting as agent of the party on behalf of which the request is made. It is the view of IDA's Management on the basis of the reasons specified below, that the Requesters do not meet these requirements.

4. The Request is signed by Mr. Reginald John Nolan and others specifying their postal addresses (and in one case a residential address), but without any indication of their residence status in the territory of the borrower or any evidence as to their identity. In the view of IDA's Management, merely being present in or mailing a letter from the territory of the borrower concerned, would not meet this eligibility criterion; a substantial presence would seem to be the requirement rather than a "fleeting" presence in the country concerned. Thus, in our opinion, the Requesters must demonstrate that they have at least a substantial presence in Tanzania.

5. We note that, while registering the Request, the Panel has not accepted the designation of Mr. Reginald John Nolan as representative of the Requesters, because no appropriate written evidence of representation has been submitted to the Panel. Further, the Supplement to the Request was only signed by Mr. Nolan and not any of the other Requesters. We agree with the Panel's decision and expect that the Requesters will be required to provide such written evidence.

6. With respect to the requirement that the affected party should not be a single individual, but a group of individuals with a commonality of interests, the following submissions are made. It should be noted that the "commonality of interests" alleged by Mr. Nolan in the Supplement to the Request is derived through Tannol Holdings Ltd., which is a Tanzania registered company with it own separate legal identity, and is not a Requester. There is also a disparity between the interests of Mr. Nolan, an owner, whose rewards are derived through dividends paid to him by Tannol Holdings Ltd. as opposed to the other Requesters who are allegedly employees of Tannol Holdings Ltd. In addition, it is not clear that all the Requesters are employees of Tannol Holdings Ltd., since the Supplement to the Request refers to "several of the Requesters" and not to all the Requesters. In short, the Request fails to demonstrate clearly a "commonality of interest" among the Requesters.

7. The Resolution provides further that the affected party must demonstrate, that its rights or interests have been or are likely to be directly affected by an action or omission of IDA as a result of a failure to follow its operational policies and procedures. It is the view of IDA's Management that the Request and its Supplement refer principally to the effect of IDA's Management's alleged actions or omissions on Tannol Holdings Ltd., the company, which is not a Requester, rather than to the Requesters. On page 1 of the Request, it is stated that "But for IDA's improper intervention, Tannol Holdings Ltd. would have developed a comparable Emergency Power Project (EPP) using private capital". On page 2 of the Request, reference is made to the fact that "the approval of the loans [for this project (i.e. the Emergency Power Project to be financed from the on-going Power VI Project)] will have a material effect on Tannol who have already and will continue to suffer great financial loss and injury". Further the request made by Tannol Holdings Ltd. to Electrical Technologies Inc. (ETI) (page 2 of the Request) to play a lead role in constructing and operating the EPP, was not made by the alleged affected individuals but by the company. On page 4 of the Request, reference is made to the fact that "Tannol/ETI was informally advised by the Government of Tanzania that it would be given a Government mandate to go forward with the EPP about January 21, 1995." Other references in the Request and the Supplement leave no doubt that the party alleged to be directly affected is Tannol Holdings Ltd. and not the Requesters.

8. The only reference to any adverse effect on the Requesters relates to the deprivation of the Requesters from significant employment opportunities and profits to the owners, who include Mr. Nolan. In the view of IDA's Management, these alleged adverse effects on the Requesters are therefore secondary and not direct as required by the Resolution. Further, there was also no guarantee that Tannol Holdings Ltd.'s offer would have been accepted by the Government, and thus generated the employment opportunities referred to by the Requesters. The inability of a company to obtain contracts does not entail any claim to be exercised by the employees or shareholders of the company concerned.

9. With respect to the claim that the Tanzania Electric Supply Company Limited (TANESCO) plan "creates a logistics nightmare" and that the risks of breakdowns and accidents represents a "significant toxic spill exposure to the Requesters, as well as, subjecting them to unnecessary noxious noise, dust and smoke pollution", IDA's Management considers that no evidence has been produced by the Requesters to substantiate their claim and to meet the burden of proof that a causal link exists between IDA's alleged failure and the potential material harm envisioned by the Requesters. No evidence is adduced for instance that the Requesters live, work or carry out activities along the route that the trucks are likely to take, in the transportation of the fuel to the Ubungo facility. As described in paragraphs B.1 through 5 of the attached Annex, the Government of Tanzania has taken all necessary action with respect to the environmental assessment as required in IDA's operational directives.

10. On the basis of the foregoing, it is the view of IDA's Management that the Requesters have not met the eligibility requirements set forth in the Resolution.

Admissibility of the Request

11. The Section of the Articles of Agreement referred to by the Requesters provides that IDA shall not provide financing if, in its opinion, such financing is available from private sources on terms which are reasonable for the Recipient. This Section raises an issue as to the admissibility of this particular claim, which is related to the decision-making powers of the Executive Directors, rather than to IDA's operational policies and procedures with respect to the design, appraisal and/or implementation of a project financed by IDA. It relates instead to one of the considerations IDA takes into account, when it decides whether or not to provide financing to a particular project. Decisions taken by the Executive Directors with respect to matters subject to their judgment, e.g. whether the borrower will be in a position to meet its obligations under the loan and whether the project can otherwise be financed on reasonable terms, do not fall within the ambit of the Resolution, nor within the powers of the Panel. These are discretionary powers vested in the Executive Directors for the exercise of which they are accountable to the Board of Governors, not the Inspection Panel. In this case the decision to approve the amendment to the IDA Credit was made by the Executive Directors, upon the President's Recommendation and with full knowledge of the alternative financing mentioned in the Request.

12. The assessment of the Government, the Tanzania Electric Supply Company Limited (TANESCO) and their advisers, with which IDA agreed, was that the terms of the proposed financing from Tannol Holdings Ltd. were unreasonable, and that its proposal was not justified on technical, financial or economic grounds, as explained further in Section A.1 of the Annex.

ANNEX

Comments On Alleged Violations

A. Articles of Agreement of IDA

1. **Alleged violation of Article V, Section 1 (c) of the Articles of Agreement of IDA: "in that IDA funding for a government-owned power plant was being provided, when a superior private sector power project could be constructed and operated with financing from privates sources".**

(a) In order to put the Tannol Holdings Ltd.'s proposal for the Emergency Power Project into context, the Panel should be aware that within Tanzania's Master Plan for the energy sector, the next least cost expansion project for the power sector, is to utilize indigenous gas for the generation of electricity. Consequently, the Government has over the last two years been in discussions with a Canadian consortium for the development of the proposed Songo Songo Gas Development Project. This project, which is part of the least cost expansion plan, is being prepared with the assistance of IDA and other co-financiers. In order to address the damage to the economy caused by power outages (estimated at about $170 million) in 1994 and to respond to higher than forecast demand growth, the Government decided to advance the purchase and installation of the turbines, which were to be installed as part of the Songo Songo Gas Development Project. The purchase and installation of these turbines was designated by the Government as the Emergency Power Project (EPP). These turbines will be converted from more expensive imported fuel to indigenous gas, once the Songo Songo Gas Development Project is completed.

(b) Prior to the receipt of the Tannol Holdings Ltd. proposal, the Government with the assistance of IDA's Management (during the period from May to November 1994), had sought solutions to the funding of the EPP, including several private sources. Approaches had been made to potential suppliers to determine immediate availability of a thermal plant, including approaches to suppliers in Norway, South Africa and Scotland. Following these approaches, there was an offer from ROTEK, a South African company, which included a proposal for commercial financing, structured by Bankers Trust Company and involving the use of relatively short term money. It relied on a sell and buy back scheme of Tanzania's gold reserves to secure payments, and Government having reviewed this offer, found the commercial terms to be too onerous.

(c) The Government on December 2, 1994, sent a letter to IDA's Management requesting that the Power VI Project be restructured to finance the necessary generating plant. Management responded by sending a mission to review the situation with the Government and TANESCO and to find an appropriate solution.

(d) The Tannol Holdings Ltd. proposal dated December 15, 1994, was to install a single 109 megawatt (MW) turbine, which was found to be inappropriate given the relatively small size of TANESCO's generation system (380 MW). This proposal was reviewed by the Government, TANESCO and by their engineering, economic, financial and legal consultants (Acres International and Hunton and Williams) and found to be technically unsound. The main reason for this conclusion was that a failure of this turbine could trigger the collapse of the entire national electricity grid. Other technical deficiencies, included an unrealistic implementation schedule; Tannol Holdings Ltd.'s inability to provide any information that it had experience operating as an

independent power producer; and the fact that Tannol Holdings Ltd. had not secured their proposed site at the Dar es Salaam Port nor demonstrated that they had undertaken an environmental assessment on the site. This last factor was important, as Tannol Holdings Ltd.'s proposal was to burn residual fuel, which generates large quantities of toxic sludge that would require adequate means for disposal.

(e) The proposed financial terms (power purchase agreement and financial arrangements) were also judged to be too onerous by the Government, as well as, being unreasonable and unrealistic. In order to finance a 109 MW machine at a cost of about $50 million, Tannol Holdings Ltd. required that the Government make a down payment of $5 million, open an irrevocable letter of credit in dollars for $14 million for a period of eight years, a letter of credit in Tanzanian Shillings with a term of 15 years, having a funded value of two months of payments of the guaranteed annual monthly minimum charge for electricity generated (approximately $8-10 million) and a Government guarantee that Tannol Holdings Ltd. could externalize its payments in foreign exchange. It should be noted that Tanzania has no credit standing in the international finance community, no access to international bank loans or capital markets on an unsecured basis, and is off-cover with all major export credit agencies. (cf. CS First Boston Report dated October 12, 1994). Further, Tannol Holdings Ltd. was unable or unwilling to provide any concrete details of its financial status or the project's financing plan.

(f) On page 3 of the Request, the Requesters state that Bankers Trust Company, which was retained by Government to compare the Tannol Holdings Ltd. offer and the TANESCO EPP proposal, in its report concluded that the Tannol/ETI proposal had a "much higher likelihood to meet" the Government's "current implementation objectives". In the view of IDA's Management, this quotation is taken out of context. First, Bankers Trust had prefaced their report by stating that the restricted time frame had affected the degree of due diligence and economic analysis they could undertake. Second, Bankers Trust compared the Tannol/ETI proposal with the proposed Songo Songo Gas Development Project and not the EPP. The full quotation from the Banker's Trust report reads, "In view of the emergency situation which obtains and the uncertainties surrounding the WB [World Bank] financing solution, we believe, based on the information we received and have analyzed in this short time frame, that the TANNOL/ELECTROGEN EPP has a higher likelihood to meet GOT's current implementation objectives. We would urge GOT, if it decides this path, to ensure that the WB [World Bank] nevertheless continues its preparations for EPP financing and equally important for the overall Songo Songo project." Subsequently, the Government, in its letter dated February 15, 1995, reiterated its request to IDA to proceed with the revision of the Power VI Project in order to finance the EPP.

(g) With regard to the economics of the proposal, an analysis was undertaken by Acres International for the Government to assess the impact of introducing a new power generation company using imported fuel, on the continued development of the proposed Songo Songo Gas Development Project, which is the next least cost investment consistent with Tanzania's Master Plan for the energy sector. The results of the analysis was that TANESCO's least cost power expansion plan over the next decade, required the utilization of indigenous gas over more expensive imported fuel and that the Tannol Holdings Ltd. proposal, as structured, was not part of the least cost power expansion option.

2. **"The announcement of the IDA financing was made prior to a recommendation of a competent committee, made after a careful study of the merits of the proposal Article V, Section 1 (d) of IDA's Articles of Agreements."**

IDA's practice is to announce a tentative lending program for each country, which identifies proposed projects in the context of a country assistance strategy. The actual financing of any specific project included in the program is subject to the approval of the Executive Directors. The Section of the Articles referred to here states that IDA shall "not provide financing except upon the recommendation of a competent committee, made after a careful study of the merits of the proposal". While modifications of existing projects are not subject in the Bank's practice to the review of the "competent committee" provided for in the Articles, an exception was made in this particular case in view of the size of the amount involved and the fact that it covers a component which could be seen, for purposes of the Articles' requirement, as a separate project. Prior to the presentation of the proposed revision of the Power VI Project to the Executive Directors, a recommendation of such competent committee was reviewed and signed by all the members, namely the expert appointed by the Governor for Tanzania, the Regional Vice President, Africa, and the Acting Senior Vice President and General Counsel . (A copy is attached as Attachment 1.)

3. **"The funding is being improperly diverted from the Power VI hydro-electric project and this diversion of funds appears to be the result of political or non-economic influences. Article V Section 1 (g), IDA Articles of Agreement".**

There is no evidence adduced by the Requesters to substantiate the claim that Management's actions or the decision of the Executive Directors were in any way influenced by political or non-economic influences. The revision of the Power VI Project to provide for the financing of the EPP was approved by the Board on the basis of technical, financial and economic information contained in the President's Memorandum, TANZANIA: Power VI Project (Credit No. 2489-TA), Proposed Amendment to the Development Credit and Project Agreements, IDA/R95-54, dated April 18, 1995.

B. Environmental Requirements

"IDA has failed to follow its operating policies contained in OMS No. 2.36, Environmental Aspects of Bank Work, para 9 (c) and (h) and OD 4.01, Environmental Assessment, Paras 2, 14-22, because the funding of the OTC Project threatens to unduly compromise the public health and safety by selection of an unsound site for the Project; and no Environmental Assessment has been performed in or were any consultations with affected individuals or NGOs conducted".

1. It should be noted that the link between the Requesters and alleged action or inaction on the part of IDA's Management has not been demonstrated (see paragraphs 7 and 8 of the Response). It is the view of IDA's Management that all applicable policies and procedures with respect to environment-related matters were followed prior to the approval of the revisions to the Power VI Project.

2. The Requesters refer to paragraphs 9 (c) and (h) of OMS 2.36 and to certain provisions of OD 4.01. The paragraphs of OMS 2.36 which are referred to, provide that "IDA will not finance projects that unduly compromise the public's health and "safety" and "endeavors to ensure that projects with unavoidable adverse consequences for the environment are sited in areas where the environmental damage is minimized, even at somewhat greater initial costs". The Tanzanian Government took this principle into account in the siting of the turbines for the EPP. The Ubungo facility, which TANESCO has selected as the site of the new thermal general units, is an already existing power generation site which has been in operation for over 25 years. There are presently two gas turbines and six diesel engines operating on the site. The two additional turbines to be installed at Ubungo as part of the EPP, are part of the above-mentioned proposed Songo Songo Gas Development Project, which are being advanced to address the emergency situation referred to in paragraph A. 1 (b) above.

3. As part of the preparation of the Songo Songo Gas Development Project, an Environmental Assessment consistent with O.D. 4.01 was undertaken for the Government and completed in December 1994. A summary was circulated to the Executive Directors on January 25, 1995 (SEC M95-91) (hereinafter, "the EA"), as required by OD 4.01 and a copy of the summary is attached as Attachment 2. The environmental assessment reviewed, inter alia, the delivery of natural gas up to the Ubungo facility from Kinyeresi, which had originally been the proposed site for the construction of the power plant (including the installation of the turbines). A decision was then taken by Government and TANESCO to install the new turbines within the existing boundaries of the Ubungo facility, rather than the new site proposed i.e. Kinyeresi, as it would have taken too long to develop the Kinyeresi site. Furthermore, in designing the EPP the same environmental standards normally applied in the USA and Canada were applied, in terms of noise and emission standards. The air emissions at the Ubungo facility are presently being and will continue to be monitored by the National Environment Management Council. It should be noted, that in carrying out the environmental assessment, key affected persons were consulted, including interviews with knowledgeable persons in Government, parastatals organizations, NGOs and local authorities (see pages 126-128 of the environmental assessment).

4. In preparing the EPP, in addition to the environmental assessment referred to above, the following environment related actions were taken by the Government and TANESCO. To mitigate any pre-existing conditions at the Ubungo facility, the Government commissioned a Regulatory Review and Compliance Audit, which was completed in April 1995. In addition, the Government commissioned an environmental site audit, the draft field summary of which was completed by the consultants in June, 1995.

5. With respect to the transportation of fuel, the Requesters state on page 2 of the Supplement to the Request, that two large tanker trucks an hour will be required to carry fuel through Dar es Salaam, 24 hours a day and that this creates a logistics nightmare, and further that "the risk of breakdowns and accidents represents a significant toxic spill exposure to the Requesters . . .". The first clarification to be made is that the tanker trucks do not go through Dar es Salaam. Instead, the route taken involves a trip from the Dar es Salaam port on a dual carriage highway leading out of the city, with only a 2-3 kilometer stretch of urban development from the highway to the Ubungo facility. The trucks do not travel through the center of Dar es Salaam which may be the impression given by the Requesters.

6. In addition to the activities mentioned in paragraph 4 above, in preparing the EPP, an analysis was carried out for TANESCO concerning the number of trucks and trips that would be required to meet the fuel demand of the existing and planned generation plant at the Ubungo facility. The analysis indicates that, even based on a very high plant capacity factor of 95%, a maximum number of seven trucks, with a capacity to hold 40 cubic meters of fuel, would make three trips per day, six days a week. This amounts to 21 trucks a day not 48, as alleged by the Requesters. Further, the trucks presently being used, and those planned to be used, are specifically designed for the transportation of fuel. Equally important, the number of trips will be reduced to less than half of the present trips, once gas is brought by pipeline into the Ubungo facility in about two years.

Attachments:
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RECOMMENDATION OF STATUTORY COMMITTEE

To: The President, International Development Association

Recommendation of the Committee under Section 1 (d) of Article V of the Articles of Agreement on the proposed Amendments to the Development Credit Agreement for Credit No. 2489-TA (Sixth Power Project) to the United Republic of Tanzania.

The undersigned Committee constituted under Section 1 (d) of Article V of the Articles of Agreement of International Development Association (the Association) hereby submits its recommendation pursuant to said Section in respect of the proposal to amend the Development Credit Agreement, dated July 26, 1993, between the United Republic of Tanzania (the Borrower) and the Association for the above-mentioned Project in order to include in the Project a component for the acquisition of urgently needed thermal generation capacity and to reallocate part of the proceeds of the Credit for such purpose.

1. The Committee has carefully studied the merits of this proposal and is of the opinion that the proposed amendments are consistent with the objectives of the Project as stated in the Recommendation of the Statutory Committee, dated April 15, 1993, and that the Project, as amended, toward the financing of which the proceeds of the Credit are to be applied comes within the purposes of the Association as set forth in Article I of said Articles of Agreement, and is designed to promote the economic development of the United Republic of Tanzania and is of high developmental priority in the light of the needs of the United Republic of Tanzania.

2. Accordingly, the Committee finds that said Project, as amended, merits financial assistance from the Association, and hereby recommends said Project, as amended, for such assistance.

COMMITTEE

André Rigo
Acting Senior Vice President and General Counsel

Nominee selected by Governor for the United Republic of Tanzania

Regional Vice President, Africa

Dated at Washington D.C.
April 18, 1995

Attachment 2

SecM95-91

FROM: Vice President and Secretary

January 24, 1995

UNITED REPUBLIC OF TANZANIA

SONGO SONGO GAS DEVELOPMENT AND POWER GENERATION PROJECT

Environmental Assessment Summary

1. Attached is a summary of the Environmental Assessment Study (EAS) for the proposed Songo Songo Gas Development and Power Generation Project. The EAS and the full report filed, have been prepared by the Borrower. Circulation of the EAS does not signify its evaluation or endorsement by the Bank. The Environmental Assessment is subject to possible change during the appraisal process.

2. Questions may be referred to the Task Manager, Ms. Karen Rasmussen (AF2EI), extension 34168. The draft report is available upon request from the office of the Director, Eastern Africa Department.

Distribution:

Executive Directors and Alternates
Office of the President
Senior Management, Bank, IFC and MIGA

EXECUTIVE SUMMARY

INTRODUCTION

The Government of Tanzania, specifically the Ministry of Water, Energy and Minerals (MWEM) has funded an Environmental Impact Assessment (EIA) of the proposed Songo Songo Gas Development Project. The gas field is located on Songo Songo Island approximately 220 km south of Dar es Salaam. The project involves production, processing and transportation of natural gas from Songo Songo Island to a thermal electric power generation facility in Dar es Salaam, connection to the existing electrical grid, and the local distribution of gas to industrial customers (Figure 1.1). The construction of facilities is expected to take approximately 18 months.

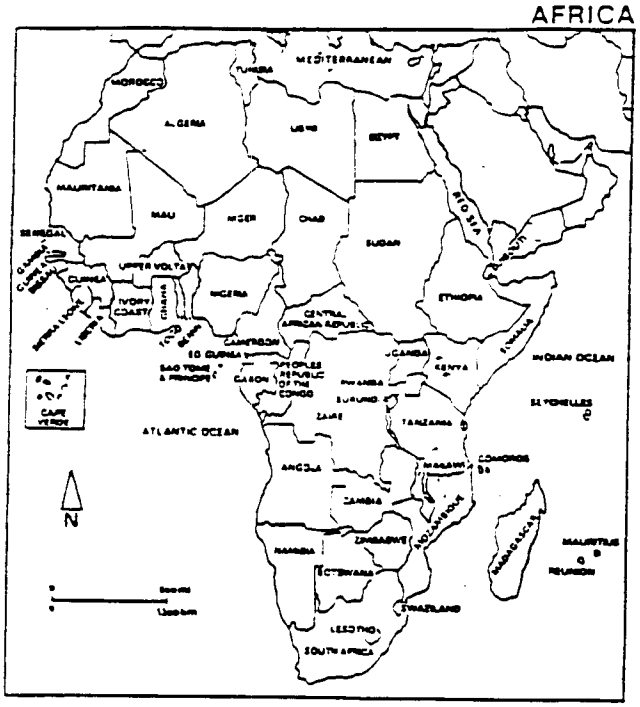
The purpose of this study is to provide an environmental impact assessment and a mitigation management plan. Since Tanzania does not have environmental assessment guidelines or environmental discharge criteria, this environmental assessment follows international environmental protection guidelines from the World Bank and Canada.

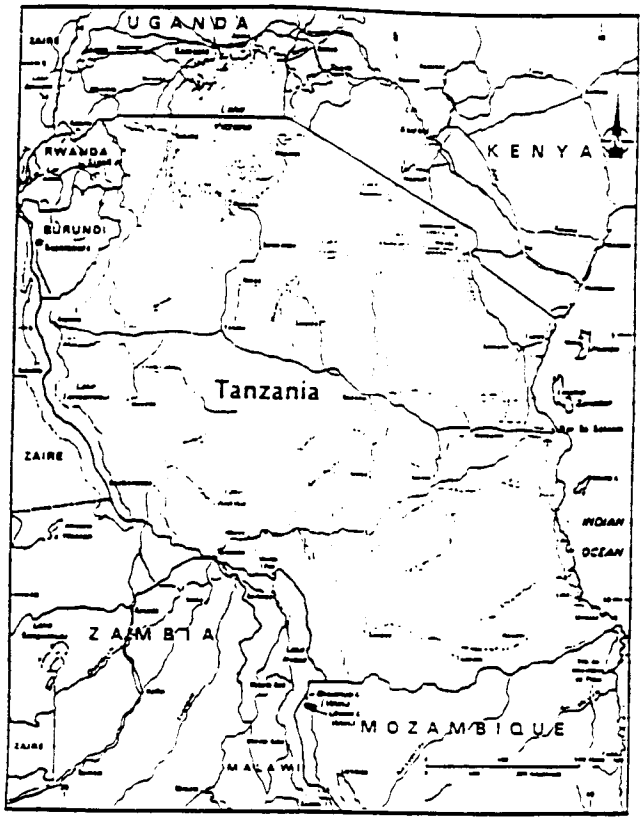
POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

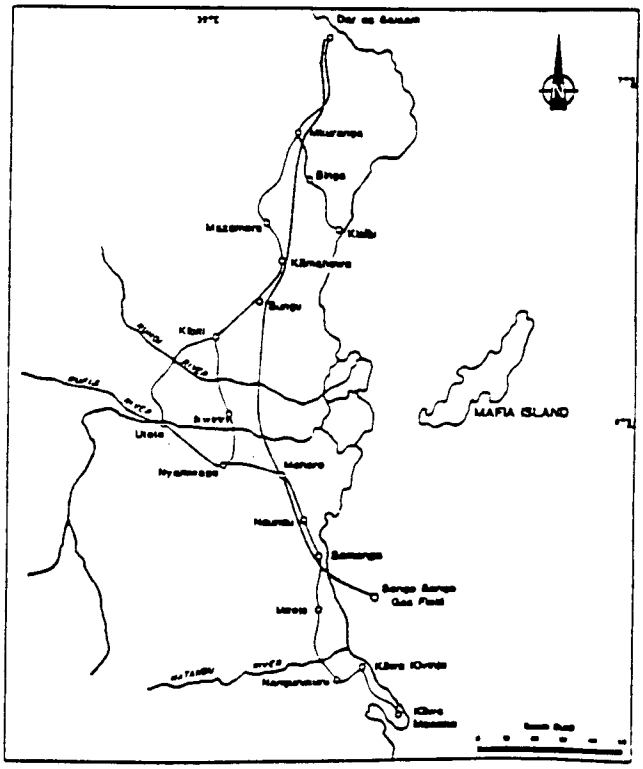
The Songo Songo Gas Development Project is responsible to two distinct levels of legal structure. The project should comply with Tanzania's National Environmental Management policy and legislation. The project is in part funded by the World Bank (International Development Association) and must also comply with their Operational Directives and Policy for natural resource management and environmental protection.

Based on this study, management of environmental matters at the legislative level is not well defined. At present, the Ministry of Tourism, Natural Resources and Environment is responsible for developing and implementing an environmental impact assessment process and ensuring that enforcement is also in place. However, they have no legislative instrument to support or facilitate this initiative. The development of a new National Environmental Management Policy is a positive action. The National Conservation Strategy for Sustainable Development (NCSSD) is being coordinated through the National Environmental Management Council (NEMC). This policy is intended to provide the framework for national environmental management initiatives. For this project, we have adopted internationally accepted standards for environmental management practices typical of similar development projects in Canada and abroad. The mitigation measures recommended for this project have been developed to also meet the standards of development as outlined in the operational directives, policies and updates of the World Bank.

Mitigation measures as defined for wildlife and protection of land shall ensure that the objectives of the legislative instruments which do support the EIA requirements are met. The process for land acquisition is also very well defined, however, this is not always well understood or fully implemented by the participants.







HBT AGRA Limited
Engineering & Environmental Services

SONGO SONGO GAS DEVELOPMENT PROJECT

Songo Songo to Dar es Salaam Gas Pipeline
Study Area Location Map

AGRA35\PJG06

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FIGURE 1.1

The Ministry responsible for environment is the Ministry of Tourism, Natural Resources, and Environment, specifically the Department of Environment. The current system is very new and the staff have limited experience in this field. There is a requirement for greater coordination and collaboration to encourage a multidisciplinary approach to the Environmental Assessment. This would facilitate the development and enforcement of practical and realistic environmental objectives such as air emission and effluent discharge standards and an effective communication system within and between departments. There is a requirement for a dedicated group that can be held responsible for the implementation and enforcement of an environmental assessment process. For this project, it is recommended that the responsibility to coordinate and implement the recommendations presented in this EIA report will be the Ministry responsible for energy. This ministry should also be responsible for the dissemination of this material to the other Ministries, the World Bank and the general public.

PROJECT DESCRIPTION

The proposed development will produce approximately 35 to 100 MMcf/d over a 20 year period from wells located on and near Songo Songo Island (Novatech, 1994). Natural gas is a mixture of saturated hydrocarbons and small amounts of water, hydrogen, nitrogen and carbon dioxide. The gas will be processed at a plant on Songo Songo Island to remove produced water and condensates. The gas has sufficient reservoir pressure such that compression is not required. The gas will be transported via a 30 cm (12 in) diameter pipeline, 25 km (16 mi) to the mainland. The mainland buried pipeline, 192 km (120 mi) long, will occupy a 30 m (100 ft) wide right-of-way during construction. The maintained right-of-way will be reduced to 20 m (66 ft) during operations. Much of the mainline will be constructed through already disturbed, agricultural land. However, some of the right-of-way may traverse coastal forest stands. The mainline pipeline will involve one major river crossing - the Rufiji River.

The proposed power plant will be located on agricultural land west of the City of Dar es Salaam and will consist of three 20 MW turbine generators. The power will be delivered initially by 132 kV overhead lines (with provision for 220 kV lines in the future) 12 km (7.5 mi) north to the existing Tanesco (Tanzania Electric Supply Company Ltd.) grid. Natural gas will be delivered to the existing Ubungo power plant by a 15 cm (6 in) diameter pipeline from the new power plant. Additional small diameter natural gas pipelines will be used to distribute gas to the Tanzania Portland Cement Company and in the future to smaller industries in Dar es Salaam.

ENVIRONMENTAL IMPACT ASSESSMENT

The potential impacts were identified by superimposing project elements of the pipeline and power plant on existing natural conditions and applying standard (internationally accepted) mitigative measures. An underlying assumption of this method is that the project will be designed, constructed and operated, with due care for safety and environmental matters using current and practical engineering practices. Wherever possible, major upsets and deviations

from normal operational conditions have been taken into account in the assessment of potential environmental impacts.

Impacts on the Biophysical Environment

The baseline biophysical information was collected from a variety of sources including a literature review, maps, air photos and an earlier feasibility report. This was supplemented by a route reconnaissance using helicopter, fixed wing and truck transportation. As well, knowledgeable personnel in government agencies and private organizations were interviewed.

Impacts and Mitigative Measures

The impact of the air emissions from the plant site are expected to be neutral because the gas is sweet, i.e. it does not contain any sulphur hence there will not be any sulphur dioxide emitted. The exhaust stacks on the gas turbines will be sized such that ground level concentrations of nitrogen dioxide do not exceed ambient air quality guidelines. The concentrations of carbon dioxide, carbon monoxide and unburned hydrocarbons are generally small and rapidly dispersed in the atmosphere.

The marine pipeline route from Songo Songo Island to the mainland traverses shallow (10 to 40 m) water and will pass beside some coral reefs and eel grass beds. There is a large variety of fish species in the vicinity of the reefs. Pipeline construction (June to October) will cause some minor and temporary siltation in the vicinity of the reefs. The tidal and near shore currents will rapidly disperse and dilute the suspended sediment thus minimizing any impact to the marine organisms and coral reefs.

The soils along the majority of the route are well drained sandy loams developed on undulating to rolling topography. Imperfectly drained clay textured soils occur in the Rufiji River floodplain and south to Ndundu. Right-of-way clearing and pipeline construction may cause low soil erosion impacts, but these will be minimized by rapid implementation of drainage and erosion control measures.

The major river crossing will be the Rufiji which is the largest in Tanzania draining 20% of the country. The other rivers including Mohoro, Ruhoi, Luhute, Mbezi, Mzinga and Msimbazi are much smaller and often have limited flow during the dry season. Local surface water resources will be protected by undertaking mainline pipeline construction during the dry season, and by timely implementation of drainage and erosion control measures. Produced water from the gas wells on Songo Songo Island will be treated to remove liquid hydrocarbons before release into the sea. Sewage from the gas plant will also be treated before release into the sea. All hydrocarbons and other chemicals will be handled in a safe and secure manner, and employees in both the gas and power plant will be trained in spill prevention and control. Emergency shutdown valves will be located throughout the pipeline system.

The major part of the pipeline route is located on land already used for agriculture. During the final route selection process measures will be taken to avoid or minimize clearing of native coastal forest. In areas where forest removal is unavoidable, a biological inventory of species composition will be made prior to clearing.

The large diversity of wildlife in the eastern coastal area has been affected by human presence over several centuries. Elephants, hippopotamus, wild pigs, baboons, monkeys, crocodiles and large numbers of bird species still occur. The Rufiji River has a large number of fresh water fish with up to 27 species recorded. Potential impacts to wildlife and fish will be minimized by confining clearing to project areas, land pipeline and river crossing construction during the dry season and preventing project personnel and contractor employees from hunting or fishing.

Disruption of agricultural activities will also be minimized by construction during the dry season. Arrangements for compensation will be part of the right-of-way acquisition programme. Where necessary, temporary crossing of open pipeline ditches will be provided, and temporary fencing will be used to prevent people and animals from falling into the open ditch.

Conclusions

Methane, the major component of natural gas is odourless, volatile and has a low solubility in water. Methane has been shown to be relatively harmless to living organisms and readily broken down by bacteria in the soil. In the event of a pipeline leak the release of natural gas into soil would have little consequence as it would rapidly dissipate in the air. Therefore, it is concluded that the construction and operation of the proposed project is expected to have low negative to neutral impacts on the biophysical environment. The final route selection will allow for the identification of the exact areas of native coastal forest and their associated biodiversity.

It is recommended that low-level air photos be obtained during the final route selection stage. These photos should be interpreted to identify any areas of coastal forest along the route. The route should then be refined to avoid these forest stands as much as possible. For those stands that cannot be avoided, a complete biological field inventory should be conducted by qualified personnel prior to clearing.

An overview of the proposed development activities, mitigative measures and residual impact of the rating for parameters of the biophysical environment is presented in Table 1.

TABLE 1

Impacts and Mitigative Measures of the Proposed Gas Development on Biophysical Environment

Biophysical Parameter	Development Activity	Mitigative Measures	Residual Impact Rating
Air Quality	Nitrogen oxide emissions from power plant Noise from power plant	• Emissions less than ambient ground level air quality guidelines (<0.05 ppm/annum) • Buffer zone around plant such that noise levels at boundary fence do not exceed 45 dB	Neutral Neutral
Marine Environment	Erosion and sedimentation during pipeline construction	• Pipeline routing to avoid coral reefs • Careful construction to minimize siltation	Low/negative, short term
Geology and Soils	Erosion of soil following construction	• Drainage and erosion control measures • Reclamation plans • Mitigation management plans	Low/negative, short term
Water Resources	Siltation and pollution during pipeline construction	• Rufiji River crossing during low flow (Sept - Oct) • Drainage and erosion control • Mitigation management plan • Fuel storage and spill contingency plan.	Low/negative, short term
Vegetation	Clearing of natural vegetation during construction	• Pipeline routing to avoid or minimize area of coastal forest • Confine clearing to project area • Reclamation plan	Low/negative, long term
Wildlife	Habitat loss and disturbance during construction and operation	• Pipeline routing to avoid or minimize wildlife habitat • Confine clearing to protect area • No hunting, or trapping by project personnel	Low/negative, long term
Fish	Siltation and pollution during pipeline construction	• Rufiji River crossing in Sept-Oct to avoid fish migration • Drainage and erosion control • Mitigation management plan • No fishing by project personnel • Fuel storage and spill contingency plan	Low/negative, short term
Land Use	Disruption of agricultural activities during construction and operation	• Power plant site location to avoid concentrated agricultural use • Pipeline construction after harvest where possible • Compensation plans • Mitigation management plan	Low/negative, long term

Impacts on the Human Environment

The quantitative baseline socio-economic information was compiled from a literature review of existing, published administrative reports. This quantitative information was supplemented by a key stakeholder consultation process to interview knowledgeable persons in selected government ministries, parastatals and NGOs to verify key issues and add qualitative perceptions and impressions. As well, the baseline was supplemented by route and facility site reconnaissance using helicopter, fixed wing aircraft and truck transportation.

Impacts and Mitigation Measures

The most important socio-economic issue which the project will face is related to acquiring the rights to the land for the pipeline and power transmission line rights-of-way and plant sites. The existing legislation and the land rights acquisition process provides for a fair and well-established means of settling the issue. However, there is a lack of understanding on the part of the general public as to their rights, and the current rate schedule of compensation entitlements appears out of date in terms of reflecting the value of land (and its productivity) as real property. It is recommended that a comprehensive land rights investigation followed by early and full consultation with identified interested parties be conducted to facilitate fair negotiations for land rights and compensation. These steps should be carried out as part of the final route selection process so that potential problem areas (especially homes and long gestation agricultural crops such as coconut, cashew nut, and mango trees, etc.) can be avoided. In practical terms, rights negotiations will need to take place very quickly after the land rights investigation so as to limit exposure to speculation and abuse.

The consultation task should be incorporated in an on-going public information and consultation programme. This will be the most important mitigation strategy. It should consist of a two-way flow of timely and accurate information about the project between the proponents and the potentially affected publics. This will enable cooperation toward common impact management objectives. It is recommended that a comprehensive project information and consultation programme be developed and implemented to provide this critical communication link on all project issues.

This process should be undertaken by the project operator so that it can take advantage of the existing experience that both the Tanzanian and external investors can contribute. Tanesco and TPDC understand the local context and legal requirements. The investors are familiar with a consultative approach to land rights negotiations and the positive effect this can have on detailed pipeline route and site selection. To ensure actual and perceived fairness in the process, an independent process 'monitor' should be appointed to advise the parties and publicly report results. Given mitigation of this nature, the residual impact of the project on human resettlement should be low.

The project will result in benefits on a local and national scale. The enhanced electrical infrastructure and access to gas energy by industry will generate indirect public service and economic spin-off benefits. These will be most pronounced in Dar es Salaam.

A significant local economic benefit of the project will be opportunities for training and employment. Due to the type of skills and experience necessary for the project, the spatial distribution of the Tanzanian labour force and the fact that a significant portion of the project activity will be located in the Dar es Salaam Region, most of these benefits will tend to accrue to residents of Dar es Salaam. Most of these employment opportunities will occur during the construction phase and will only be temporary in nature. The operations phase of the project will also generate employment and training opportunities which will be smaller in number but of a longer term nature.

Songo Songo Island will also realize a significant local benefit. This will result from the availability of excess potable water and electricity at the gas plant. Additionally, it would not be unreasonable for residents in the vicinity of the pipeline, power plant and transmission lines to also expect that the project may result in enhanced access to energy for themselves, either in the form of gas or power. There may be good economic and engineering reasons why this may be impractical but they will be unconvincing and will seem illogical to many. Mitigation for this natural increased level of expectation is open and honest communication about the limits to local energy distribution combined with a vigorous programme of delivery of other project-related economic benefits at the local level. This programme should also include an ongoing awareness component to highlight the extreme and potentially deadly danger of attempts to acquire use of the high pressure natural gas on a "self-serve" basis.

As mitigation, a local benefit programme could be developed and implemented. Further community consultation is required to determine the programme's feasibility, particularly regarding the involvement of the communities along the pipeline route in the long-term maintenance and security of the right-of-way. This could result in an on-going, mutually beneficial relationship between the project proponent, local communities and individual land owners/users. As an integral part of the land acquisition negotiations, farmers and other local interests could be monetarily compensated for any unavoidable immediate and long-term damage to cropping ability, and for full and unrestricted access to and use of the right-of-way for pipeline construction. In addition, they could also be allowed to re-crop the right-of-way (with certain restrictions against large trees and deep root crops) on a condition of long-term free access by the project proponent for security and maintenance. The cropping, or locally managed alternate revegetation, would provide long-term soil, slope and pipe stability and would limit access by outsiders to mitigate both environmental degradation and security concerns. If this agreement were to incorporate some annual fee for maintenance and security (perhaps regular foot patrols by local residents), it would also provide a needed service to the project proponent and engender a sense of local 'ownership' in the project and its well-being.

National economic benefit of the project accrue from the expenditures on supply and service contracts within the local business community, particularly during construction. The challenge is to deliver the maximum amount of business to local suppliers (in all regions, not just Dar es Salaam) which is consistent with the project's requirements for competitive price and quality, with two provisos. The first is that the project should endeavour not to encourage speculative investment in new capacity that can not be sustained beyond the short-term construction phase. The second is that, through its local purchases, it should not cause shortages, and related possible disruption and price inflation, particularly in critical sectors such as food supply and transportation.

Two mitigation strategies are available to optimize local business content. First, include specific provisions in the prime contracts to facilitate delivery of local sub-contracts. Second, the project proponent could split-off certain specifically identified components from the main contract and procure these directly. This may be more difficult in some respects but it would enable a more flexible response to the time and capacity constraints that some local suppliers may face, i.e., components such as the pipeline right-of-way and facility site clearing and preparation could be started sooner and spread out over a longer period. It would also facilitate the encouragement of specific joint ventures or capability expansions that would enhance the objective of technology transfer.

The extent to which construction camps will be used to house the temporary workforce is an important element of the construction plan. If a secure, self-sufficient worker accommodation facility is provided, then local communities will be somewhat insulated from potentially harmful interaction with outsiders (construction workers and their recreational activities/spending are often associated with social impact). If workers are accommodated in local communities or live-in camps which are serviced and supplied by local communities, then this may increase the risk of such interactive impact, but it will be accompanied by a higher potential economic spin-off benefit. It is presumed there will be a camp facility on Songo Songo Island, as well as two or three mainline pipeline construction camps. However, it is anticipated that there will be no need for a camp at the Kinyerezi power plant site due to its proximity to Dar es Salaam. It is assumed that the construction contractors would provide workers with appropriate daily transportation to and from the Kinyerezi site (i.e., buses).

This assessment did not identify any significant known historical resources/sites in the vicinity of the project facility sites or the pipeline corridor. However, the areas between Dar es Salaam and Songo Songo Island are very rich in terms of cultural resources. A continuous archaeological surface survey should be undertaken as the pipeline route is finalised. Any promising areas could then be the subject of test pit digs to determine archaeological potential. In addition, an important component of the project information and consultation programme will include interviews with local informed sources such as village elders and leaders to discover if there are any cultural resources sites in the vicinity of the route. Continuous archaeological monitoring of trenching for the gas pipeline should be undertaken to salvage any archaeological materials that have not been anticipated by the surface survey and which might be encountered.

Conclusions

The construction and some operation of the proposed project is expected to have low negative to neutral impacts on the human environment with issues such as land rights and resettlement. However, there will also be positive, moderate impacts on the human environment as a result of this project, specifically in the issues of employment and entrepreneurial opportunities.

It is recommended that a pre-acquisition land rights investigation be completed along the entire length of the pipeline route and in the vicinity of all project facility sites to determine the ownership of the land and identify all interested parties to be involved in any compensation negotiations. It is also recommended that a historical resources survey be conducted prior to final alignment selection to identify any currently unknown significant areas to be avoided.

An overview of the proposed development activities, mitigative measures and residual impact of the rating for each parameter of the human environment is presented in Table 2.

TABLE 2

Human Environment

Human Environment Parameter	Development Activity	Mitigative Measures	Residual Impact Rating/ Direction
Land Acquisition and Human Resettlement	Obtain land use rights for plant sites and pipeline right of way Displacement of some urban residents	• Sociological study of existing and traditional land rights/use • Multi-party consultation process and negotiations with land owners; process as per existing legislation; agreement on fair compensation • Ministry/IBRD monitoring	Low/negative, long term
Local Benefits	Operations employment and training Construction employment and training Local procurement	• Right-of-way, Maintenance and security agreements • Recruitment of staff during construction • Construction phase training positions • Rural recruitment access • Timing to avoid local agricultural labour demand peaks where possible • Assess local capabilities and match to project needs • Early notice to business community • Incentives to prime contractor for local content or designated direct subcontractors from local firms	Moderate/positive, long term Moderate/positive, short term Moderate/positive, short term
Public Information and Consultation	Timing and location of all project activities Uncertainty and resistance to change	• Continuous multi-party information and consultation programme as project planning and implementation tool	Neutral
Worker Behaviour	Environmental damage due to carelessness or poor construction practice and social impact	• Environmental orientation and training programme	Neutral
Worker Accommodation	Local supply and services and camp followers Public service delivery and social impact	• Local purchasing and re-supply without shortages/inflation • Government planning to meet requirements	Moderate/positive, short term Low/negative, short term
Historical Resources	Damage to historical artifacts form ditching and site development	• Final pipeline alignment survey to avoid significant areas • Construction phase monitoring and salvage	Low/negative, short term

MITIGATION MANAGEMENT PLAN

The mitigation management plan describes the basic or generic environmental protection procedures for the construction and operation of all aspects of the project. The plan focuses on specific protection measures that must be applied in the field. The plan is a stand alone document for use by field personnel and the procedures outlined in the plan should be implemented to minimize potential adverse environmental impacts.

The World Bank has identified a list of potential key issues that should be addressed during the environmental assessment and mitigation. Our assessment focussed on the following key issues for the purposes of this study:

1) Biological Diversity;
2) Coastal and Marine Resources;
3) Wetlands;
4) Involuntary Resettlement; and
5) Cultural Properties.

In general, the construction and operation of the proposed project is feasible, and impacts are expected to be negative but manageable and of short duration or neutral. There are also some positive impacts related to socio-economic issues that are likely to be realized for the operational life of the project. However, in order for the mitigation management plan to be effective, we recommend that the following be completed as part of the final route selection process:

1) aerial photography prior to finalize pipeline alignment and facility site selection;
2) a comprehensive land rights investigation, and a negotiation and compensation programme; and
3) a detailed and focussed archaeological survey.

The mitigation management plan is organized according to site specific facilities (i.e., gas plant, power plant, pipelines, access roads) and specific activity (i.e., general procedures, construction, operation, preventative procedures, clean-up procedures, emergency spill contingency, and reporting). The document is written using suitable terminology for it to be directly incorporated into contract documents.

An environmental monitoring plan has also been prepared to provide feedback on the environmental protection measures and the problems encountered, and to provide a mechanism to adjust and alter the mitigation management plan to achieve the desired results. The monitoring programme details requirements and procedures for necessary personnel and their education and the specific environmental parameters that require monitoring. Additional information regarding the training requirements and costs has been included. This includes the approach and rationale behind institutional strengthening programmes that have been

recommended to provide a formal avenue for a transfer of technology to Tanzania in the environmental assessment and management process.

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