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11. Conclusions and Recommendations

11.1 Cement Market

It is forecasted that demand for cement in Yemen, based on the planned industrialization trend for the coming years, will be steadily increasing.

Assuming that the extension of Mafrag Cement Plant is completed in 1998, it will be inevitable, however, that even the increased production capacity of 1,800,000 T/Y will be surmounted by the steady growth of cement demand of 1,889,000T/Y forecasted for the year 1998 even in the pessimistic case.

In view of the market, the demand in the southern part of the Country to which Mafrag Cement Plant is expected to supply cement will be on the rise and it will be beyond the production capacity after the extension.

Judging from the above supply-demand point of view, it is urgently needed that the extension of Mafrag Cement Plant is to be realized in the earliest possible opportunity.

11.2 Expansion Plant

1) Raw Materials

(1) Raw Materials and Utilities

Three kinds of raw materials, limestone, volcanic rock and sandstone are used for existing plant and same raw materials are also used for expansion plant.

Existing quarries of these raw materials have enough deposit for both of existing and expansion plant operation.

(2) Electric Power Supply

Supply of electric power from Al-Barh substation (public electric power supply) is not sufficient for both of existing and expansion plant so that electric power for the expansion plant is supplied from diesel power generating plant newly installed together with the expansion plant.

(3) Water Supply

Required water for plant operation is obtained from the water source which is newly developed deep well and supplied to the plant by means of pipeline.

(4) Fuel Supply

Fuel oils used in the plant are heavy oil and diesel oil. These are supplied to the plant by tank lorry truck.

2) Plant Equipment

(1) Production equipment

Production capacity of cement : 1,700 T/D

Expansion plant applies same process of existing plant in order to arrange exchangeability to the existing plant. Equipment is designed to consider environmental assessment.

The plant is constructed adjacent to the existing plant.

(2) Supporting Facilities

Supporting facilities such as office, stores and housings for employees and their families are also constructed.

3) Construction Schedule

Plant construction is started with adoption of consultant and carried out by contractor selected by way of tender. Total construction period is expected to be 36 months from the selection of contractor.

11.3 Financial and Economic Analysis

1) Financial Analysis

FIRR figure of 11.8% as a result of the Financial Analysis proves itself that the profitability of the project from the corporate's point of view is sufficient for the project realization.

2) Economic Analysis

Economic Analysis to study the benefit this project will generate for the sake of the Country has given the EIRR figure of 15.4%. Judging this together with such effects as improvement of trade balance due to decrease of cement import and creation of new employment, even from the State's point of view this project is regarded as feasible.

11.4 Recommendations

Based upon the demand forecast in this study, even with the addition of the production of 500,000T/Y by Mafrag Cement Plant to be commissioned in 1993 to the present total production capacity, it will be still too far from solving the supply-demand gap which plagues the Country.

In the light of the above situation, and considering the fact that Mafrag Cement Plant is located in the vicinity of the ex-South Yemen area and also of the economically important cities like Taiz in the southern part of the ex-North Yemen, both of which will require cement for their development from now on, it is reasonably judged that the expansion of Mafrag cement with careful consideration for Environmental Protection shall be given the first priority among the others.

As the financial and economic soundness and profitability are proved, soonest possible realization of this project as a main Project for the National Development, is hereby strongly recommended in order to meet the demand which will be further enhanced by the oil production-related necessity in the near future.

