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13 December 1977
English

RESTRICTED

ADVISORY SERVICES IN INDUSTRIAL PLANNING^{1/}
DP/SYR/76/011
SYRIAN ARAB REPUBLIC .

Terminal report .

Prepared for the Government of Syrian Arab Republic by the
United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of nine UNIDO staff members, team leader Jean Barnerias;
P. Kukorelly, a consultant from the International Trade Centre on Marketing;
A. Aglan, glass expert and A. Ruecker, automotive tyres expert

United Nations Industrial Development Organization
Vienna

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Explanatory notes

References to dollars (\$) are to United States dollars, unless otherwise stated.

The monetary unit in Syria is the Syrian pound (LS). During the period covered by the report, the value of the LS in relation to the United States dollar was \$US 1 = 3.95 LS.

A full stop (.) is used to indicate decimals.

A comma (,) is used to distinguish thousands and millions.

References to tons are to metric tons, unless otherwise specified.

The following abbreviations are used in this publication:

GNP	Gross National Product
IDCAS	Industrial Development Centre for the Arab States
GECI	General Establishment for the Chemical Industry
IRDC	Industrial Research and Development Centre, Damascus

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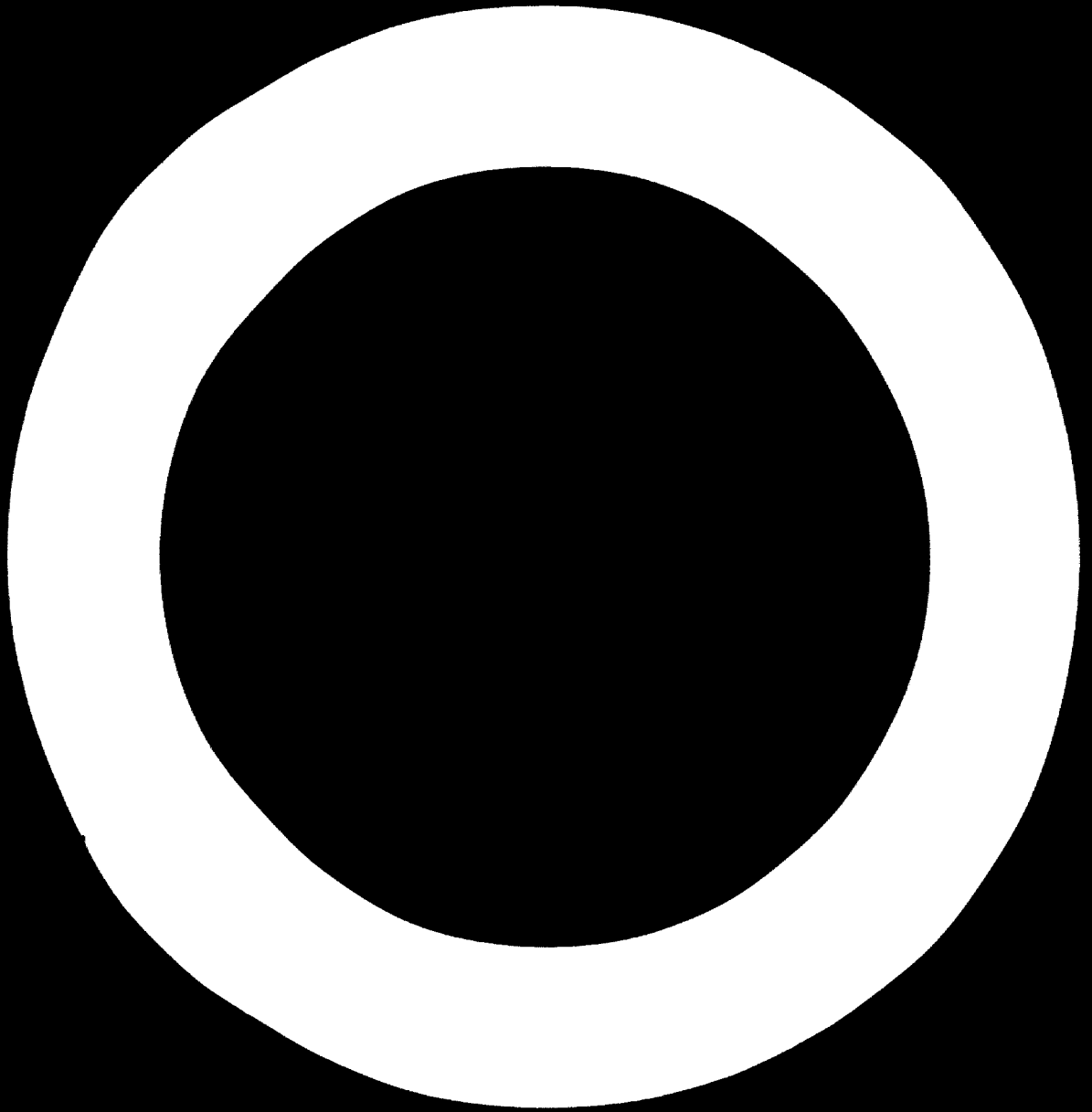
ABSTRACT

The project "Advisory Services in Industrial Planning" (DP/SYR/76/011) was requested by the Government of the Syrian Arab Republic in November 1976 to analyse eight major industrial projects technically and financially and to advise on their viability or non-viability. These were all large-scale investments and part of the Fourth Development Plan for the period 1976-1980. The industries were: ammonia-urea, pulp and paper, tyres, glass, cement, detergents, vegetable oil and vegetable canning. A summary of the findings and recommendations on each project forms part II of the report.

The project was carried out largely by technical staff of the United Nations Industrial Development Organization (UNIDO) under the "New Dimensions" programme for field missions of about one month, followed by report writing in the Secretariat. A UNIDO staff member acted as team leader in the field for four months and the project was co-ordinated by the Feasibility Studies Section of the Industrial Operations Division of UNIDO.

In this way all field work and immediate advice to the Government was completed in seven months from the time the preparatory mission reported and agreed on a project document and programme of work.

The project demonstrates the advantages of the "New Dimensions" approach to technical assistance both in speed of execution and the quality of the work produced.



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I. TERMS OF REFERENCE AND IMPLEMENTATION

A. Origin of the project

The Government of Syria launched in 1976 its Fourth Development Plan for the five year period 1976-1980. The Plan has targets of investment, employment and output higher than the three previous plans combined. While investments during the first, second and third plans were LS 2720, 5,000 and 8,000 million respectively, the amount is LS 44,778 million in the fourth Plan. The GNI is expected to grow from LS 19,000 million to LS 35,000 million, i.e. at an average rate of 12% per year. On a sectoral basis the Plan is expected to achieve significant increases in most sectors and especially in industry (+ 90%).

Under the Plan, the industrial sector is to get a major share of the planned outlays with over 22% of the investment target. Within the industrial sector, the main beneficiaries will be chemical industries, cement, textile and food. As a result of these investments, multiple increases will occur in many industries such as glass, detergents, vegetable oil, vegetable canning, fertilizers, while new industries will be established such as tyres and pulp-and-paper.

In connexion with the finalization for the Plan which was still at the draft stage, the Government in 1976 expressed its desire for urgent assistance in industrial plan implementation, and asked for the services of experts in the following areas: (a) industrial planning, programming and formulation of policies, (b) industrial location analysis, (c) project evaluation and allocation of priorities, (d) marketing and financial aspects of industrial projects in selected industries.

B. Preparatory mission

The project was organized and managed by the Feasibility Studies Section of the Industrial Operations Division of UNIDO. The project was completed in nine months between November 1976 and August 1977. The cost of the 18 man months of technical assistance delivered was only US\$ 25,000.

In answer to the Government's request, and in order to make the required assistance more effective, it was decided to immediately send an exploratory mission (Phase I of the Project) with the following tasks:

- (a) To review the draft development plan with special reference to the industrial sector,
- (b) To secure relevant clarification on the nature of the technical assistance required for the development of the industrial sector,
- (c) To prepare detailed terms of reference for Phase II and draft a project document together with job descriptions and time schedule of implementation.

The mission arrived in Syria on 13 November 1976 and concluded its investigations on 1 December. As a result of meetings with the State Planning Commission it was established that technical assistance was required to examine specific industrial projects, analyse them technically and financially, and advise on their viability or non-viability.

Eight industries or projects were selected by the Government for investigation by the UNIDO Phase II team. These were, given in order of priority:

Pulp-and-paper plant, Deir-ez-Zor
Ammonia-urea plant, Hama
New cement plant, Hama
Vegetable oil industry, Deir-ez-Zor and Aleppo
Tyre plant, Hama
Glass plant, Aleppo
Detergent plant, Damascus
Vegetable canning plant, Hasakeh or Meyedin

It was anticipated that over the short duration of the Project only 5 to 6 industries could be covered, though the number could be extended to eight if sufficient background work was completed before the arrival of the mission. Short-term specialists would be required for each of the selected industries, and these specialists would be needed for about three weeks each.

C. Project document

The Project Document states that in assisting in the implementation and/or revision of the draft industrial development plan, the Project will contribute to the achievement of the economic and social objectives of the Plan.

According to the Project Document, the project will undertake to (a) re-examine the selected industrial industries or projects, and analyse them technically, financially, economically and as concerns their location, and (b) evaluate the projects and establish whether they are viable or not.

For most of the plants, contracts with suppliers have already been signed, equipment has been ordered, and civil works started. In one case the plant is already on stream. The techno-economic investigations to be undertaken by the Project, in order to establish whether the industrial projects are viable or not, will not be feasibility studies proper but financial/economic appraisals of investments already in hand.

The Phase II activities will be:

- (a) Establishing the detailed work programme, and checking the information collected at the State Planning Commission.
- (b) Undertaking techno-economic and market investigations of the industrial projects submitted for appraisal,
- (c) Making location analysis of the industrial projects whenever required,
- (d) Making financial and economic analyses of the industrial projects,
- (e) Evaluating the industrial projects and establishing whether they are viable or not,
- (f) Preparing a terminal report on the findings of the mission and recommendations for further technical assistance,
- (g) Discussing the draft terminal report with the State Planning Commission.

In order to accomplish these tasks, fourteen man/months of international staff were budgeted for the project, namely:

- Team leader and co-ordinator: a senior economist with extensive experience in planning and implementation for new industries. He will be responsible for co-ordination of the team activities and preparation of terminal report. Duration: 4 months.
- Financial analyst: for financial and economic evaluation of industrial projects. He will be responsible for evaluation of industrial projects on the basis of data provided by market studies and techno-economic studies. Duration: 3 months.
- Marketing expert: marketing specialist with experience in market studies, preferably in chemicals and agro-industries. He will be responsible for assisting in completing or preparing market studies on the proposed products, and advising on the most adequate methodology for their preparation. Duration: 1 month.
- Technical specialists: engineers specialized in the specific industries to be appraised. They will be responsible for preparing techno-economic analyses of the industrial projects examined. Duration: about 3 weeks each depending upon the extent of appraisal work involved.

D. Phases and duration

The preparatory mission (Phase I of the project) was in the field from 13 November 1976 to 1 December 1976. It formulated the technical assistance required and wrote the Project Document stating the objectives and defining the activities of Phase II during which the Project was to be actually implemented. The preparatory mission also elaborated some formats to be filled by the Government agencies in order to prepare the ground for the Phase II mission.

Phase II was due to start at the beginning of February 1977. However, delays occurred both in Government clearance and completion of the formats, so that Phase II started on 9 March 1977 with the arrival in the field of the team leader and the financial analyst. Work in the field proceeded from 9 March to 4 May and again from 1 June to 20 July 1977. The team leader was at UNIDO headquarters in the period 5-31 May for consultations with the team members and the backstopping officers.

The activities of the team can be seen as falling into two categories, viz. data collection and data processing. Data collection met with a number of difficulties due to language, unreliability of sources of information, and in several instances lack of adequate counterparts. The mission went to the field with almost nothing on hand except a mere list of the eight industrial projects to be examined. While there, the mission was given the contracts signed by the Syrian Government with foreign companies for the supply of seven of these projects on a turnkey basis. Obviously this was not enough for the preparation of techno-economic reports and consequently most of the time in the field was devoted to gathering the necessary data without which no project evaluation could be made. In spite of these difficulties, data collection was altogether (with one exception) surprisingly successful. The information thus collected was embodied in technical

reports and marketing notes relating to each of the eight industrial projects. The stage of data collection was completed on 14 July with the return to UNIDO of the last short-term specialist.

Data processing started in early April with the drafting of the first financial/economic analysis. It continued in the field until 20 July and at UNIDO headquarters after that date until completion of the eight analyses relating to the industrial projects selected for examination.

The mission called the early attention of the Government to the importance of marketing for all the industrial projects being examined. Concerning the international aspects of marketing, the Government asked UNIDO to help in getting assistance from the International Trade Centre (Geneva). Following which, a proposal was formulated by the marketing expert of the team and accepted by the Government. This component involved two man/months expertise from the International Trade Centre, which was implemented in July-October 1977 as a complement to the Project.

E. Composition of the team

Since its inception the Project was scheduled for implementation under "New Dimensions", meaning that team members would be drawn from UNIDO headquarters except when a specialization would not be represented in the staff.

The preparatory mission (3 weeks) was implemented by two economists from UNIDO headquarters, and Phase II was implemented by a team of eleven people, of which nine were selected from UNIDO staff and two (for glass and tyres) were outside experts recruited for the purpose. The team leader remained in the field for 15 weeks, the financial analyst $6\frac{1}{2}$ weeks, the marketing specialist 4 weeks, and the technical specialists between 2 and 3 weeks each. The only component not fully delivered was the financial analyst post which was covered only half time. The team leader filled the gap by writing four financial/economic analyses (out of eight programmed) on top of his normal duties as co-ordinator. On the other hand, most staff members spent additional time at headquarters working on the Project so that delivered expertise was considerably larger than that shown by the time spent in the field.

The team sent to the field was carefully selected as shown by the list of UNIDO staff and experts at Annex I.

F. Counterparts and logistic support

At the beginning of Phase II the Government implementing agency (State Planning Commission) nominated two counterparts of which only one spoke English. Apparently, they were not released from their normal duties and did not work with the team, but they were very useful in establishing first contacts with other government agencies. Another counterpart was later designated, Mr. Talo, an economist from the Industrial Research and Development Centre who was seconded to the State Planning Commission for the purpose and worked with the team until 4 May. Unfortunately in June and July he was no longer available being on a training course abroad.

The technical specialists found their counterparts in the agencies dealing with the specific industries involved, and the marketing expert was assisted by a counterpart from the State Planning Commission during his second two-week visit to the field. These counterparts were instrumental in providing data and information on the industrial projects. In one instance (vegetable canning) the adequate counterpart was found only in the last days of the specialist's mission, and in another instance (tyres) no proper counterpart was found.

Logistic support in the field was minimal especially as concerns transportation. No car was ascribed to the project though two were provided for in the budget. Though visits to plant sites were well organized, transportation in town was often a problem which slowed down the work of the team, and the team leader had to spend an inordinate amount of time trying to secure necessary transportation for the team.

The offices assigned to the project in the building of the State Planning Commission were spartan though adequate, but telephone was erratic and document reproduction was poor and of little use. Most office supplies were provided by the State Planning Commission and the rest could be bought on the budget of the project. An oldish typewriter was borrowed from the UNDP office. Secretarial services, paid for by the Project, were of poor quality both in typing technique and English spelling. These circumstances explain the rather poor outlook of the documents typed in the field.

Acknowledgement should be made here for the continuous support received from the UNDP office in Damascus, and the assistance received from (a) the Industrial Research and Development Centre through the release of Mr. Talo as counterpart and (b) Project DI/SYR/72/030 through the release of Mr. Abida, UNIDO expert, for 1½ man/months.

G. Reporting

Eight technical reports were prepared by the technical specialists. In one instance (tyre project) the specialist was unable, partly for lack

of sufficient information, to write an adequate report. As a rule, the technical reports cover the following items: (a) technical aspects of the industrial project, including, when appropriate, the suitability of raw materials and the compatibility between equipment and production programme; (b) techno-economic aspects: investment cost, depreciation and replacements of equipment, operating expenses detailed as to materials, manpower, maintenance, etc.; (c) findings and recommendations, at the technical and techno-economic levels, for action or further technical assistance.

Eight marketing notes were prepared by the marketing specialist. There is a marketing note for each project except paper (since the marketing aspects were already pretty well covered in the technical report), and another marketing note deals with distribution channels for consumer goods in Syria especially detergents, vegetable oil and canned food.

As to the financial-economic analyses, four were prepared by the team leader, three by the financial analyst (namely: detergents, vegetable oil, and vegetable canning). They all follow about the same pattern: market analysis and techno-economic analysis (corresponding to project formulation), financial analysis (financial evaluation), and socio-economic analysis (socio-economic evaluation). A note on the financial/economic appraisal of the cement project was prepared by a third UNIDO staff member.

The team leader wrote several progress reports in the course of the project in order to keep UNDP and UNIDO duly informed of its achievements. The terminal report was drafted in Vienna immediately after completion of field work and finalized in October 1977 after receipt of the ITC international marketing reports.

The procedure of submission originally adopted by UNIDO was for reports written in the field to be submitted first to UNIDO as drafts and then by UNIDO as finalized versions to the Government. This procedure was later abandoned because it caused unexpectedly long delays, and the State Planning Commission preferred to receive drafts immediately even though the reports were to be finalized later at UNIDO headquarters. Out of 35 reports (excluding the international marketing component), 20 had been submitted to the Government by the end of July either as final versions or drafts.

Eight international marketing reports were added as a complement to this Project when received from the International Trade Centre in October 1977. Altogether 33 documents were prepared under the Project (see list in Annex).

H. Methodology of analysis

The approach taken in the first four financial analyses was to go directly to what may be called the intrinsic value of a project obtained by considering the net cash flow before financing (the other three financial analyses skipped this phase). Then, supplier credit and any foreign loan tied to the project are taken into account in order to obtain a net cash flow showing the flow of domestic resources used in the project and resources released to the Syrian economy. Since the Government is the sole owner of the project this net cash flow is identical to the social surplus at market prices obtained as a first step of the socio-economic analysis according to the ILCAS/UNIDO Manual for Evaluation of Industrial Projects in Arab Countries. Socio-economic evaluation was conducted according

1/ Ammonia-urea, pulp and paper, tyres and glass.

to the method recommended in the IDCAS/UNIDO Manual and based on the concepts of national value added and social surplus.

The main sources of data for the technical reports and the financial-economic analyses were the contracts with the suppliers of equipment and the formats prepared by the government agencies concerned. The formats included tables on investment costs, manpower requirements and operating expenses. Some of the data supplied in the formats, however, were found to be unreliable or incomplete.

Other observations on the financial-economic analyses are as follows.

Project formulation

Property taxes, already entered in the formats under "overheads" or "other costs," could not be isolated in most cases and are therefore generally included in operating expenses.

Accounts are shown in Syrian pounds at the official rate of exchange of 3.95 for one US dollar; the sign for Syrian pound is SP or more customarily LS.

Financial analysis

Cash flow tables were drawn on the basis of an operating life of 10 to 12 years;

Discounting was done on the assumption of uniform flows within each year and continuous compounding of interest.

Socio-economic analysis

The mission had neither the mandate nor sufficient time and manpower for calculating national parameters, however

No adjustment had to be made for the rate of exchange since the free market rate is near the official rate (less than 10% difference);

The social rate of discount was estimated to be of the order of 9%, corresponding to the lending rate of the Public Debt Fund.

I. Contribution of the International Trade Centre

UNIDO requested the International Trade Centre to provide an international marketing consultant to examine the eight technical reports from the point of view of the global export possibilities of the eight product groups.

The study was carried out by desk research in Geneva since it was not considered necessary for the consultant to visit Syria.

As a result eight international marketing reports were made available to the Syrian authorities.

II. SUMMARY OF FINDINGS AND RECOMMENDATIONS

A. General comments

The eight projects selected for analysis total about LS 2.2 billion in fixed investment and the same figure for financing requirements. By order of magnitude the projects can be listed as follows:

In million LS	<u>Fixed investment</u>	<u>Financing required</u> ^{a/}
Ammonia-urea	887	900
Pulp-and-paper	475	485
Tyres	450	515
Glass	131	79
Cement	121	92
Detergents	82	85
Vegetable oil	36	40
Vegetable canning	17	16
TOTAL	<u>2,199</u>	<u>2,212</u>

a/ After deduction of suppliers' credits

All these projects except one (vegetable oil) involved commitments as contracts had been signed with suppliers of equipment. They were in various stages of completion between plan levelling and start up, and one plant (cement) was already operating. A general feature is that reportedly no feasibility study was ever made for these projects. The technical specialist on vegetable canning was told that such a study existed in that field but could not obtain any real evidence.

Four of the projects benefit from supplier credits (tyres, glass, cement and vegetable canning). No information could be obtained about other loans from Arab sources, except in one case (pulp and paper) in which it could be assumed that the loan was tied to the project. If any other loans existed it could be presumed that they were not tied to particular projects but rather granted to the Syrian government in order to pay for investments already decided upon quite independently. In such circumstances the projects can be evaluated without having to take these loans into consideration.

The locations were usually found suitable. Since in most cases construction work was already in progress, there was not much point in studying alternative locations, and all the more so as strategic and political considerations were also important in choosing the original sites. In one case, however, on economic grounds, it was recommended to study the relocation of the project even though land development is already completed and some equipment still in crates is on the site.

It was also found that marketing considerations are important in most projects. Marketing problems will be particularly acute for glass (two

plants coming on stream nearly at the same time), vegetable canning (three plants due to come on stream at short intervals), urea (large quantities coming suddenly onto the market) and ammonia (because of its physical characteristics). For most projects part of the production will have to be exported, at least in the first years, in order to run the plants at or near full capacity. It was therefore recommended to immediately consider adequate measures for marketing the new productions both in the Syrian market and foreign markets.

Rates of return vary considerably from one project to another and for the larger projects returns in socio-economic terms are lower than financial returns, as shown by the following table:

	Rates of return		Explanation of difference
	Financial	Socio-economic	
Ammonia-urea			
Alternative 70/93	5%	Negative	Subsidized inputs
Alternative 90/93	6.5%	Negative	Subsidized inputs
Pulp and paper			
Basic formulation	3%	Lower than financial	Selling prices higher than import prices
After improvements	7%		
Tyre manufacturing			
GCCI estimates	2%	Lower than financial	Selling prices higher than import prices
IFDC estimates	Over 9%		
Glass	14%	Good	
Cement	12%	4%	Subsidized inputs
Detergents			
As proposed	1%		
Reformulated	11%	Over 12%	
Vegetable oil	14%	Good	
Vegetable canning	9%	Good	

In cases where rates of return are low, it was found that the reasons were mainly faulty economic design, and secondarily the relatively high cost of some inputs or investments. Investment costs, though on the high side, are generally comparable with those for similar plants in other developing countries. In two instances investment costs seemed unusually high, but in one case this could be explained by the recoupment of unusually favourable credit terms.

B. Ammonia-urea

Location: Homs
Investment: LE 887 million

Production capacity: 1000 tons/day ammonia
1050 tons/day urea
Status: contract signed (turn-key)
levelling work completed
equipment at least partly on the site but
still in crates
Contract: scheduled to come on stream at beginning of 1980
amount involved LS 800 million
no supplier's credit
Characteristics: naphtha as feedstock
surplus ammonia to dispose of, heavy subsidy
on naphtha priced at LS 53 instead of opportunity
cost of LS 446 (\$113/ton).

The ammonia-urea project was contracted for in November 1975 and is currently under construction. The site has been prepared and part of the equipment has been delivered but is still in crates. Erection of buildings and installation of equipment will take place in late 1977 and in 1978 and will be completed in early 1979. The rest of the year 1979 will be used for test runs and start-up. The ammonia and urea produced in the last months of 1979 will go into the constitution of working capital. Commercial production will start at the beginning of 1980.

The project presents two characteristics of great importance: 1) it will use naphtha as a feedstock to produce ammonia, and 2) the two units for the production of ammonia and urea are not matching so that there will be a surplus of ammonia which cannot be absorbed by the urea producing unit.

The first characteristic conditions the economics of the project. Currently naphtha governs a world market price which is slightly higher than the world market price of ammonia. Although the world market for ammonia is somewhat depressed because of large overcapacities compared to current demand, the situation is not expected to improve much in the near future as many countries, particularly in the middle East, are building additional ammonia capacity using natural gas as a feedstock for which no other immediate utilization exists. From an economic point of view considering the opportunity cost, it would obviously be better to export naphtha and import ammonia, or even import urea directly. From a financial point-of-view the project is redeemed to a certain extent by a subsidy in the form of a low price for the main feedstock, naphtha, set at one eighth the world-market price.

The second characteristic creates a marketing problem because some ammonia is produced as a surplus which must be sold as such, involving investment in special transportation equipment, or must be transformed into other products easier to store, transport and sell, involving additional investment in processing facilities. There is also a marketing problem for the urea produced by the project in large quantities; outlets have to be found in the agricultural sector.

The conclusions of the analysis are as follows:

- Technically the project is sound. Its location at Homs together with the petroleum refinery and other chemical fertilizer plants is favorable as concerns maintenance and marketing, but re-location to the north-eastern gas fields should be considered in order to benefit from natural gas with a low opportunity cost.

- Financially, in spite of a low price of naphtha, the rate of return of the project is low, viz. 5% in Alternative 70/93 and 6% in Alternative 90/93.

- In socio-economic terms, if production costs alone are considered, economic appraisal is about the same as financial appraisal. If, as it should be, economic appraisal is made on the basis of opportunity costs, the project appears clearly uneconomic (negative cash flow). Considering this effect alone, the project should be replaced by a programme of naphtha exports and urea imports. About the same quantities of urea could be obtained this way without any investment. However, the project may have a very important psychological and institutional effect. Ammonia and urea, being produced locally, will have to be used in agriculture. This compelling situation can have a multiplier effect on agricultural production (and hence exports) which will eventually pay for the project.

- The marketing of output will be a burdensome problem to handle. As concerns urea it is a problem of quantities to distribute to consumers. Large amounts of credit will be involved which should be part of the agricultural development plan. As concerns ammonia, the difficulty lies in the nature of the produce. Ammonia may be applied directly in the area around the plant, and part of it may have to be exported by trucks to neighbouring countries or by sea. Additional investments in transportation and storage facilities have to be considered. Export outlooks both for quantities and prices are not favourable (more details in the international marketing report). On the other hand, further processing of ammonia into DAN, DAS or CAN does not seem promising.

- The use of natural gas as feedstock instead of naphtha may be considered for the plant at Homs when gas is made available there, provided its opportunity cost is below that of naphtha. The cost of conversion (which is relatively small) will have to be taken into account.

- Immediate re-location to gas fields may be considered provided that (a) there are sufficient reserves of gas, say 30 times the annual requirements estimated at 300 million cu. m. (b) the potential annual production can be enough to ensure continuous supply even in case of closure of one well or one field, say three times the annual requirements, (c) the gas used has a low opportunity cost. The project, if re-located on the north eastern part of the country, would show somewhat larger investment, operating and marketing expenses but these would be more than compensated in economic terms by the low (opportunity) cost of gas and the effect on the economy of the region (employment, distribution of income, local expenses, local application of ammonia and consequent agricultural development). Financially the project would remain with a low rate of return (below 5%), but in socio-economic terms its economics would be much improved.

Based on these findings the following recommendations are submitted for consideration:

For immediate action

- Study in more detail the economics of re-locating the project on the gas fields in the north-eastern area. The study should be made by a specialist in this type of production.

- Prepare the marketing of the output.

For urea: start urea imports in order to accustom the agricultural sector to its use, these imports will be paid by exports of naphtha, which is the

solution which would have been recommended in the absence of the project. Have a crash programme of information and demonstration, and set up extension services for the use of nitrogen fertilizers.

For ammonia: Prepare the direct application of ammonia to the area around the site of the plant. That area should use ammonia instead of urea to the largest extent possible. Obtain a detailed estimate of the additional investment in storage and transport facilities necessary for the distribution and application of ammonia.

For both products: Foresee the credit facilities necessary for the successful marketing of the entire output, and study the possibilities of exports to, and exchange with, neighbouring countries and other countries around the Mediterranean.

- Prepare the operation of the plant by training Syrian personnel abroad partly with the supplier of equipment and partly in existing plants.

For action before start-up

- In connexion with the future operation of the plant:

Contract management consultancy services, and assistance by foreign personnel, to operate the plant for the first three years after start-up.

Secure electric power supply of highest reliability and establish an efficient maintenance system. If the plant is at Homs, establish a centralized maintenance workshop to serve the fertilizer complex and the refinery as well as the ammonia-urea plant.

Appoint a highly-qualified specialist in waste water purification and biological treatment of effluent fluids in order to install an adequate waste water system during construction of the plant.

- In connexion with staff welfare, consider the establishment of a housing colony for factory staff.

For further action after start-up

- For the plant at Homs, consider conversion to natural gas, when available in the area, if its opportunity cost is lower than that of naphtha.

C. Pulp and paper

Location:	Deir-ez-Zor
Investment:	LS 475 million
Production capacity:	30,000 tons/year pulp 60,000 tons/year paper
Status of the Project:	contract signed in April 1975 levelling activities being completed equipment being delivered scheduled to come on stream in 1979
Contract:	amount involved no supplier's credit Abu-Dhabi loan

The project is expected to contribute to the industrial development of the Deir-ez-Zor area as well as to valorize a local resource namely

straw which is a by-product of cereal production in Eastern Syria. For technical reasons the project will also depend on softwood pulp which will have to be imported. The pulp imports will entail a heavy cost in foreign exchange which could be relieved later on by the development of soft-wood production in the Euphrates area and the shifting of the product mix to qualities of paper and board requiring a lesser amount of soft-wood pulp in their production. The new project is designed to cover most of the country's consumption of the main types of paper and board until the mid 1980's. In the first years of production a part of the output will have to be exported in order to permit full utilization of the production facilities.

The conclusions of the analysis are as follows:

- Technically the project is sound.
- Financially, in spite of rather high selling prices, the internal rate of return of the project is well below the standard established by the Government. Since the standard rate of interest charged by the monetary authorities on their loans to industry is 9%, it is expected that industrial projects will be able to repay the loans and pay this interest after payment of all other taxes normally applying to industrial activities. In this project, without payment of taxes, the internal rate of return is 3.4% in the basic formulation and may rise to 7.5% after working in a series of improvements.
- From a socio-economic standpoint the main contributions of the project are to distribute income in the Deir-az-Zor area and to train nationals in new skills. As concerns the balance of foreign exchange the net contribution of the project is positive but the foreign exchange saving is obtained at a relatively high cost in national resources.

The following recommendations can be made for the purpose of obtaining the best possible results from the project:

For Immediate Consideration

- Training of personnel. This will be the first mill of its kind in Syria and it is important to train the future personnel beforehand in their duties. There are wheat straw paper mills in a number of countries, among which are Algeria, Egypt, Greece, Romania and Turkey. There are also esparto straw pulp mills in Morocco and Tunisia. The training of personnel should be carried out in some of these mills and foreign technicians from these mills should be hired for the start-up of the Syrian mill.
- Collection and cost of straw. The straw pulp mills above have organized the collection of straw, although in small quantities. A Syrian team should study on the spot during the harvesting season how the collection of straw is carried out. Also, from now on, wheat harvesters imported for the Euphrates region should only be of the type which has the necessary attachments to bale the straw while harvesting. One third more straw can be salvaged by such harvesters. Moreover, on the basis of the experience of existing straw pulp mills the cost of straw to this mill might be reduced considerably. Some mills get straw at \$20 per ton instead of the \$60 per ton used in the basic formulation of this project. Perhaps a cost of \$30 per ton could be reached. The savings thus obtained would be considerable.

- Export markets. In order for the mill to work at or near capacity, about one quarter of the output will have to be exported in the first years of operation. The export outlets must be well explored and defined beforehand, trade contacts made, and contracts prepared. Appropriate quality is a pre-condition for exports.

- Ecology. According to the technical specialist, the electrolytic/mercury process retained for the mill should not be used. There is always the likelihood of losses of mercury, a very strong poison, which would contaminate the sludges of the effluent treatment plant and the water of the Euphrates river. The diaphragme process should be used instead.

- Lay-out of the mill. The lay-out of the mill should be re-checked before the erection work in consideration of the main wind direction.

For longer-term action

- Recovery and recycling of waste paper. It is advisable to organize the collection of waste paper on a national scale, and learn how to collect, grade, bale, ship and store the various grades of waste paper. The installation of a de-inking plant should be studied. The reduction in imported pulp through the recovery of waste paper could total \$2.4 million/year.

- A further reduction in imported pulp may be achieved by changing the product mix and the sales programme to grades of paper and board requiring less soft-wood pulp.

- Soft-wood production: The afforestation programme in the Euphrates area for the production of poplar and pine wood should be pursued on schedule in order to obtain as soon as possible a local source of raw material for pulp. The production of newsprint from such pulp should be foreseen in ten years. The experience of countries planting such trees for use in pulp mills should be studied.

- By-products: The sale of the various by-products (grain, lime mud, sludge, caustic soda and hypochloric acid), according to the technical specialist's estimation, could produce L.S. 1.1 million per year.

- Days of operation: According to the specialist, the mill could be run for 330 days/year and not 300 days as planned. This, however, pre-supposes perfect management and cannot be anticipated at this stage.

- Natural gas: The use of cheap natural gas, if and when available, for the power plant instead of fuel oil would also release this oil for potential export and might improve the socio-economic profitability of the mill.

D. Tyres

Location:	Hama
Investment:	LS 450 million
Production capacity:	yearly
	590,000 tyres
	630,000 tubes
	145,000 flaps

Status of project: contract signed
levelling completed
buildings being constructed
scheduled to come on stream at mid 1980.
Contract: amount involved LS 420 million
supplier's credit LS 145 million

The project is for erecting a tyre plant near Hama in the center of Syria in order to cover the requirements of the country (or most of them) from 1980 onwards regarding automobile tyres and tubes. The contract with the supplier of equipment was signed in July 1975 and currently the site is being prepared. The plant is to be completed in 1979 with trial runs continuing in the first half of 1980. Commercial production is expected to start by the middle of 1980.

The contract with the supplier foresaw a plant producing also tyres and tubes for bicycles. However, since there exists a bicycle tyre factory working under capacity, it was later decided to drop that line in the project and increase instead the production of bus and motorcycle tyres and tubes. Some other changes have been made from the original production programme in order to adapt it to the expected requirements of the country on the basis of new estimates. The new programme is about 20% larger in terms of rubber used but can reportedly be handled by the equipment already ordered so that investment remains about the same.

The financial and economic analysis is based on a study of May 1977 by the Industrial Research and Development Centre, Damascus. It considers the project with the up-dated production programme.

The findings can be summarized as follows:

Technically the project is not well defined. The contract with the supplier contains a list of equipment and expected consumption of materials. However, the technical specialist was unable to check these figures in the absence of detailed specifications. Moreover, the production programme was changed and enlarged over the original one but it is not clear whether the ordered equipment can adequately fulfill the new tasks.

There is no definite techno-economic study and actually there are two sets of estimates for material cost. In the absence of a firm foundation for the financial and economic analysis, the following conclusions are only tentative.

Concerning the financial aspects, it can be said that:
on the basis of GECI cost estimates, the project has a very low profitability level and will not be able to pay interest on the local loan from the Public Debt Fund; on the basis of IRDC estimates which foresee a much lower cost, the project could reach a fair profitability level and could pay interest at 9% on the loan.

Concerning the socio-economic aspects, when taking into account that domestic sales prices are 25% higher than export prices, it can be said that:
on the basis of GECI cost estimates, the project is definitely uneconomic;
on the basis of IRDC cost estimates, the project has a rather low profitability for the national community.

Based on these findings and the reports by IRDC and the marketing specialist, the following recommendations are submitted:

For immediate consideration

- The prospective material cost should be ascertained and the adequacy between the new production programme and the proposed equipment carefully checked. As tyre moulds are very costly, the profitability of the individual moulds (and of the entire plant) should be looked at in relation to the expected sales volumes. A precise techno-economic study should then be prepared on the foundation of complete, up-dated and definite data.

- The prospective requirements of the national market and the neighboring countries should be further investigated. Specific actions to be contemplated should be: (a) survey of the Syrian car park, (b) elaboration of a tyre marketing strategy: which types should be manufactured, which imported, which exported, (c) marketing and trade agreement with neighbouring countries, supply contracts with them, (d) quality guarantee, (e) study of price trends of tyres in relation with price trends of raw materials. These investigations will assist in determining the exact assortment of tyres to be produced and offered to consumers, optimum sale approach, and appropriate competitive prices. The international marketing note suggests that the best solution might be a management contract with an established tyre manufacturer who would also market the production (under his brand-name for exports). There may be export possibilities to Algeria and Libya.

- Training of personnel is of crucial importance. The supplier, by contract, should provide 353 man/months training to as many as 17 people (average 21 months each). Immediate steps should be taken in order to start training for those supervising the construction of the plant, and then for those who will have to operate it. Special training above and beyond the contract provisions should be contemplated in the matter of quality control and road testing.

For further consideration

- In order to improve the efficiency of the plant, the production programme could be stream-lined. Fewer types and sizes would be produced, some of which would be exported; other types and sizes would continue being imported. This involves marketing for exports (see above recommendation 2).

- Recapping and retreading would advantageously be added to the activities of the plant. This can be easily done with little additional equipment to the contemplated production lines.

- Production of rubber soles, belts, sheets, etc. could also be added. The waste of rubber compound in the process of tyre production can be considerable and these quantities can be re-used in a sideline production where lower specifications are acceptable.

Quality control and road testing should be organized. An area must be appropriated and developed for road testing. Quality control will be done in laboratories and on the production lines.

- Pollution control, specifically effluent water treatment, must be established before the plant goes on stream.

- The eventual production of guayule rubber could be studied, utilizing Mexico experience. Guayule is a rubber plant growing in dry subtropical and tropical climates.

E. Glass

Location: Aleppo
Investment: LS 131 million
Production capacity: 40,000 tons/year of sheet glass, bottles, table ware and tempered glass
Status of project: contract signed
civil engineering work well advanced
buildings being constructed
equipment already on site
scheduled to go on stream in 1978.
Contract: amount involved LS 78.4 million
supplier's credit LS 62.7 million.

After an international tender the contract was signed in May 1974. The original plan was to have the project at Alkadam near Damascus but it was moved to Aleppo due to strategic, social and provincial considerations. A year later however, it was decided to have another factory at Damascus (Alkadam). Both projects are to be executed on a turn-key basis. The project analyzed is the one at Aleppo and the other project at Damascus is considered only in as much as it will affect the future market for the products of the Aleppo project. Whether the existing Alkadam factory is to be modernized or closed will be decided later according to marketing possibilities.

The main findings are as follows:

- Technically the project under construction represents a step forward as regards the scope and technological standard of glass manufacturing in Syria. The project also introduces a new product in the country, namely tempered (toughened) glass. Besides glass production as such, the project includes equipment for control and automation which will provide an example for equipping other industries with similar devices.
- Financially the project will yield a good return on investment provided it is properly managed and the output can be sold both in Syria and abroad in the quantities and at the prices expected.
- Regarding marketing, the combined production of the new Aleppo and Damascus plants (even excluding the old Alkadam factory) will largely exceed national demand, with the consequence that either the surplus must be exported or the plants must run below capacity. The international marketing report foresees great difficulties in finding export outlets.

The following recommendations are put forward for the purpose of obtaining the best possible results from the project:

For immediate consideration

- A thorough market study should be undertaken as soon as possible. Available information has helped in preparing the analysis of the project on

a realistic basis. However, more detailed information on the national market and the foreign markets is necessary in order to develop and programme an adequate marketing strategy. The study will determine demands, prices, quality norms, assortment to be offered, etc. In addition to research concerning the size of demand for the various products offered by the plant, it will be necessary or at least useful to undertake some qualitative investigations of consumer tastes and preferences in the field of table ware and decorating glass particularly.

- A marketing strategy should be developed, for the four glass product lines, parallel to the execution of the above-mentioned study. Promotional sales and distribution activities will be planned within the context of the marketing strategy retained. Product development, and the production programme to a certain extent, will follow the indications provided by the study and incorporated in the marketing strategy. An export market for the products may best be developed by setting specific norms for certain styles and qualities which after some time will become identified as to their origin. Product development also involves packaging. The determination of optimum packaging for sheet glass export in particular should receive early attention.

- The planning authorities should consider measures to encourage the use of glass containers in the country and discourage the use of other containers (metal and plastics) which have to be imported and are not so safe regarding public health.

- Thorough training of personnel at almost all levels will be a determining factor in making full and best use of the installed equipment, and allowing the plant to produce efficiently and at full capacity.

For future consideration.

- Co-ordination of the projects in Aleppo and Damascus is to be considered in order to avoid under-utilization of capacities when the Damascus project goes on stream. The second plant should come on stream with a sufficient time lag allowing market demand to catch up with installed capacity. Co-operation between the projects can also facilitate reaching common solutions for problems confronting both plants such as: raw material supply, mould making, training of personnel, market research and prospection of markets, etc.

- Production of sodium carbonate in Syria can be contemplated in view of the quantity which is to be used by the glass industry as soon as the second project (Damascus) becomes operational. This material represents a high proportion of raw material cost and currently has to be imported. Its production locally does not seem to present any technical problems, and the basic ingredients necessary for its production are available in the country namely salt and electric power.

F. Cement

Location:	Hama
Investment:	LS 121 million
Production capacity:	1000 tons/day
Status:	the plant is already operating
Contract:	amount involved LS 41.7 million supplier's credit LS 35.4 million

The new cement plant at Hama is already working at full capacity. The performance parameters indicate that a satisfactory start has been concluded and that all guarantees given by the supplier of equipment had been filled. The new plant is a good representative of the other cement plants currently being planned in Syria. All the new plants are based on the dry-process technology, equipped with energy saving pre-heaters, and electrofilter as well as other anti-pollution devices keeping dust emission to a minimum.

Based on approximate information about operating costs and a factory-gate selling price of LS 135 per ton, the cash flow indicates an internal rate of return of about 12% per year. The investment cost seems high but the difference is recouped through extremely favourable credit terms from the supplier. This means that the internal rate of return is somewhat higher than the figure actually calculated, and the rate of return on the Syrian capital involved is considerably higher also.

In order to arrive at a socio-economic evaluation, adjustments should be made for (a) the price of cement since the selling price is a little lower than import prices, (b) fuel and electricity prices. These energy inputs can be considered as heavily subsidized because their prices have not changed significantly since pre-1973 levels. The net result is that the rate of return in socio-economic terms is much lower than the financial return (about 4% instead of 12% if one assumes a four-fold increase in world energy prices).

The marketing note and the international marketing report stress the fact that there may be larger overcapacities than currently anticipated by the planning authorities and that, on the average, cement plants may well have to work below capacity since export outlets for this product in the Mediterranean area are very dubious. Such an occurrence would obviously reflect in an adverse way on the profitability outlook of the plants affected by production cuts. If exports must be contemplated, then the markets to be particularly investigated would be Libya, Iran and Saudi Arabia. Since transportation for export must be in bulk, some investment in specific loading equipment would be needed.

G. Detergents

Location:	Damascus
Investment:	LS 82 million
Production capacity:	1500 kg/hour active matter 500 kg/hour additives (about 39,000 tons/year detergents)
Status of the project:	civil works and buildings almost completed equipment mostly delivered scheduled to come on stream in early 1973
Contract:	amount involved LS 44.5 million no supplier's credit

Conclusions

Based on the original production programme (i.e. active matter, powder detergent, liquid detergent and scouring powder) the plant is not profitable even at full capacity assuming that the whole output can be sold.

However, if active matter is entirely converted into powder detergent, the sales revenues can be increased by 15% which is enough to make the project attractive. According to the technical specialist this change in the production programme does not involve any additional investment. Because of increased sales of powder detergent the project becomes profitable with an internal rate of return of 11% per year, which is higher than the prevailing rate of interest. The net cash balance is negative only in the first year of operations and becomes positive for the rest of the project life in spite of heavy financial obligations (supplier's credit and internal loan) averaging LS 20 million a year.

From the socio-economic point of view the project will make a positive contribution to the Syrian economy. It will create about 200 permanent jobs, two-thirds of them requiring skilled labour. The project will generate an annual average of LS 19 million of net value added, four-fifths of which will go to the government in the form of interest on loans, taxes and profit. The net foreign effect of the project is positive and amounts to LS 28 million a year.

These positive results can be achieved only if the following recommendations are taken into consideration and implemented.

Recommendations

The most important recommendation is the conversion of all the active matter into powder detergent. It is in this product that the profit lies. As stated above the change in the production programme will not entail any additional investment.

According to the sales programme 34% of the project income is expected to derive from export. This will require a co-operation agreement to be made with a well-known foreign company (as proposed by the technical specialist in his report) in order to provide the know-how for detergent formulation, permit the use of their trade-mark, and handle exports to neighbouring and Gulf countries.

The international marketing report states that exporting will be very difficult and that therefore the project should aim at selling as much as possible in the national market in order to minimize the exportable surplus.

Selling in the national market will itself be a major undertaking. The national product must be of same quality as branded products, and for the same quality level the national product might be sold at a lower, more attractive price. However, such procedure might also negatively affect the prestige of the national product and eliminate it from the market. For these reasons, therefore, the marketing strategy must be thought out carefully regarding both the local market and exports.

Conclusions and recommendations of a more technical nature

The technical specialist in his report concludes that the Adra detergent plant has been well designed and properly equipped, and its manufac-

turing process has been suitably selected and devised. All those factors would enable the plant to produce good quality products but may not be sufficient to make standard products which would need additional efforts as recommended below.

1. Formulation is the most essential step in the manufacture of detergents. It may be possible to obtain know-how from firms with good reputation or this know-how may be developed by the plant itself with the assistance of a well-experienced expert. In any case, it should be dealt with attentively in order to ensure that the products should be of good quality and minimize production costs.
2. Adequate quality control should be carried out in the plant. Not only the active material in the products should be determined but also the detergency test of the products should be introduced. This test would especially be necessary if research on detergent formulation would be carried out by the plant.
3. There are some different considerations from technical and economic points of view regarding the selection of sulphonating agent, in the case of the present plant, it is SO_3 . SO_3 has some advantages as it is a cheap material, it reacts fast and requires a relatively small sulphonator and it can sulphonate a series of organic chemicals. Its unfavourable points are that the investment cost is higher and additional sodium sulphate is required for detergent formulation, whereas in an oleum sulphonation plant it does not need the SO_3 conversion equipment and sodium sulphate is produced in the process thus saving some cost. Since sulphuric acid/oleum will be available from the fertilizer plant, the detergent plant may consider to add an oleum sulphonation unit in its next expansion.
4. In order to strengthen the Syrian technical personnel, it is recommended that fellowships be provided for their young chemists engineers to be trained abroad.

H. Vegetable oil

Location:	Deir-ez-Zor
Investment:	LS 36 million, in two stages 20.5 million and LS 9.8 million
Production capacity:	to process 1st stage 35,000 tons/year cotton seeds 2nd stage 60,000 tons/year cotton seeds
Status of the project:	feasibility study stage no contract signed.

In his report the technical specialist recommended the introduction of the solvent extraction process in the existing plants in Aleppo and the establishment of a new vegetable oil plant at Deir-ez-Zor. The main raw material (cotton seeds) for the new plant will be available from the local gin factory and the larger part of the oil produced can be sold in the area. The proposed plant will have an annual processing capacity of 35,000 tons/year of cotton seeds, to be increased a few years later to 60,000 tons/year.

The financial/economic analysis concludes that the proposed plant at Deir-az-Zor is a good project. While existing plants are receiving a subsidy on each ton of edible oil produced in order to maintain consumer prices at low level for social purposes, the new plant will not require any subsidy for balancing its accounts. This means an important saving for the Government.

Considered from the operator's viewpoint the project is a profitable venture. The internal rate of return calculated over a life-span of 17 years - 2 years for construction and 15 years of operation - is about 14% thus exceeding the interest rate applied to the local loan.

The project contribution to the national economy also appears positive. The new oil plant will valorize 60,000 tons/year of cotton seeds which will be available in the Deir-az-Zor area where cotton plantations are being de-developed with the related cotton ginneries. The processing of cotton seeds will bring more value added and benefits to the area in the form of edible oil and cattle feed, and the workers in the area will receive more income as more employment opportunities are offered. The project will have a beneficial impact on the country's balance of payments as there will be additional exports of linter and a decrease in imports of edible oils.

The production programme in vegetable oil aims at fulfilling national requirements and does not foresee exportable surpluses. However, if at a later date, some exportable surplus is foreseen, the recommendations outlined in the international marketing report should be considered and implemented.

I. Vegetable canning

Location:	Hasakeh
Investment:	LS 17 million
Production capacity:	4,000 tons/year
Status of the project:	contract signed site levelled construction work in progress scheduled to come on stream in 1979
Contract:	amount involved LS 4.8 million supplier's credit LS 3.9 million

The proposed canning plant at Hasakeh is expected to process fruits and various vegetables besides tomatoes which will account for the larger part of its activity. The plant is to be located at Hasakeh in the middle of an area with agricultural potential.

Conclusions and recommendations of the financial/economic analysis

The financial analysis shows that the internal rate of the project is almost equal to the rate of interest charged on local borrowing (9%) but higher than the rate applied to the foreign supplier's credit (6%). Since the rate of interest on the supplier's credit is lower than the one on domestic financing there is a leverage effect which brings down the interest paid on the entire borrowing. The average rate is estimated at 8.40%. This rate being lower than the internal rate of return, the project will be able to repay all the loans.

The financial results of the project would improve still further if its productive capacity is used more extensively by processing additional vegetables and fruits. It is proposed for instance to process at a later date 300 tons/year of green peas.

From the socio-economic standpoint the project contribution to the national economy is also positive. There will be a sizeable distribution of income in the Hasakeh area. The project will induce the local farmers to increase their production of vegetables and fruits for sale to the new canning plant, thus increasing their own revenues. The project will also have a beneficial impact on the country's balance of payment if half of the output can be exported as contemplated.

The above positive results can be obtained if the following recommendations are taken into consideration:

- Raw materials: Measures should be taken in order to ensure a steady supply of fresh vegetables and fruits to the canning plant. Only tomato seems to be available in the plant vicinity, but there seems to be yet no definite programme for the production of the other raw materials. The supply of fresh fruits and vegetables should be spread over as long a period as possible in order to ensure an extended use of the plant productive capacity. To this effect, a study should be made on the types, qualities, quantities of the various vegetables and fruits which can be produced in the Hasakeh area.

- Marketing study: The above financial and economic analysis was made on the assumption that the whole output can be sold and that it can be exported. The production of the new plant will come onto a market where national requirements are already largely met by existing producers. To compound the problem, two new plants at Mayadin and Idlib are also scheduled to come on stream at short intervals. Most of the new production will not find outlets in Syria and thus the export problem seems to be of a specially large magnitude. On the other hand, if all difficulties are surmounted, this export potential may be of great benefit to Syria. A thorough marketing study should therefore be made as early as possible with the objective of assessing the market potentials for canned fruits and vegetables both in Syria, and in the neighbouring countries or any other country where exports are likely to take place. The international marketing report contains specific recommendations to that effect.

Recommendations of the technical specialist

These recommendations of a more technical nature relate to the supply of raw materials and the provision of tin cans.

In order to operate profitably, the plant should be regularly supplied with raw materials of good quality and at the appropriate time. The agricultural productions should be programmed in quantities, harvesting periods determined, quality checked. The plant operator should establish a post of agriculturalist for the necessary agricultural extension service or establish close co-operation with such a service if it already exists in the area.

The plant should be provided with cans of good standard as concerns tin plate, coating and lacquering. This is of utmost importance as concerns

exportable products. In this connexion a re-organization and streamlining of can manufacturing in Syria should be carried out in order to provide cans of good quality at low cost to the three canning plants being projected at Hasakah, Hama and Idlib.

J. Follow-up assistance

As a follow-up of Project DF/SYP/76/011, the following suggestions are submitted for technical assistance which may be implemented either separately or as a package.

- Ammonia-urea

(a) Study the technical and economic aspects of relocating the proposed plant in the north-eastern gas fields. Inputs: three-week mission by technical specialist, two-week desk work by economist.

(b) Disposal of ammonia

(i) Investment involved in transporting and storing specified quantities of ammonia.

(ii) Equipment involved for the direct use of ammonia as a fertilizer

(iii) Investment and operating costs for processing ammonia into ammonium nitrate and/or ammonium sulfate

Inputs to be determined according to the exact tasks required.

- Tyre manufacturing

Work out a definite formulation of the project, clearing up remaining uncertainties about operating expenses, cost of moulds, and compatibility of ordered equipment with modified production programme. Inputs: four week mission by technical specialist, two-week desk work by economist.

- Vegetable oil

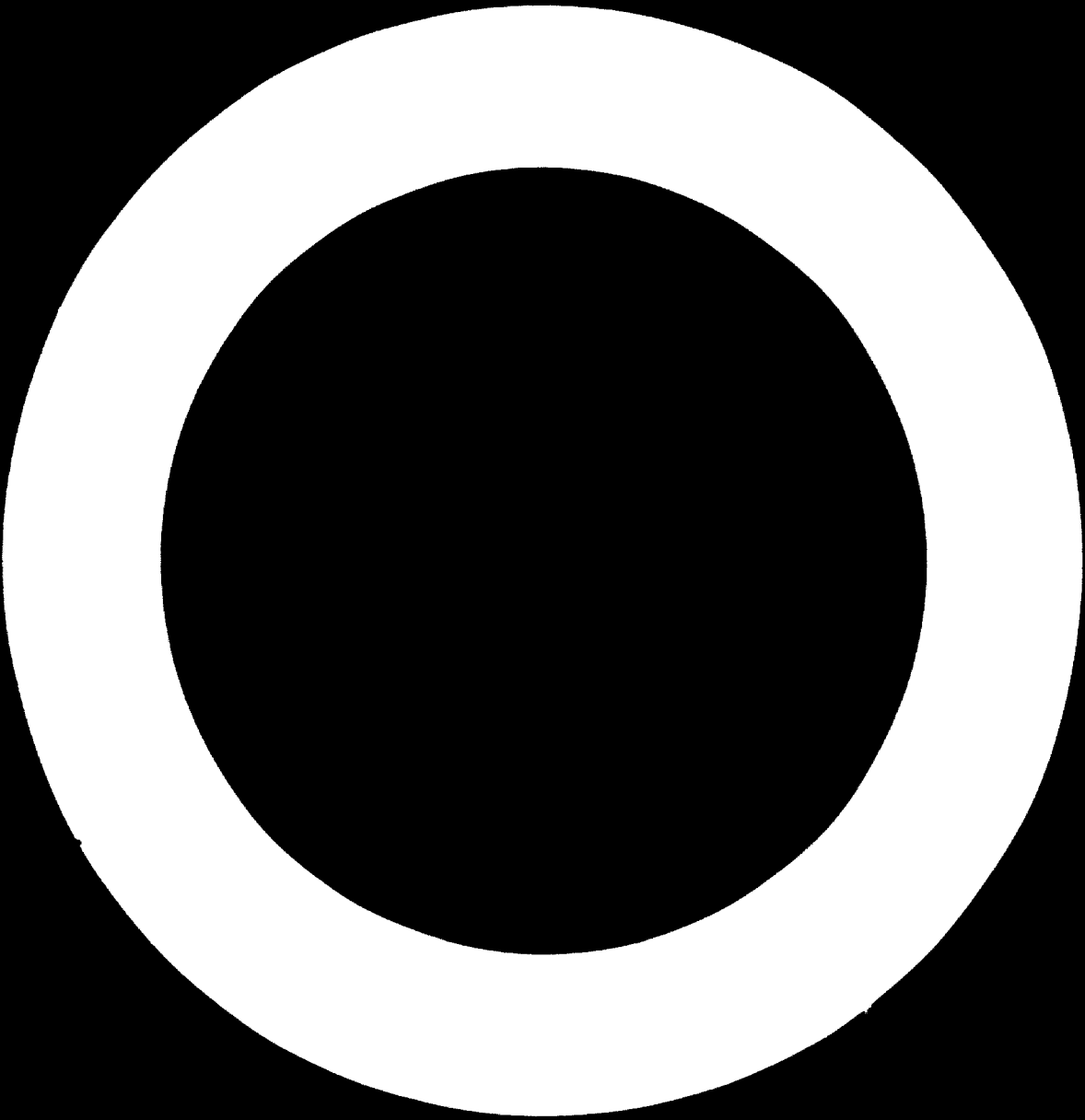
Prepare a complete feasibility study of the project. Inputs: six weeks by technical specialist partly in the field, three weeks by industrial economist partly in the field.

- Cement

Evaluate the opportunity and profitability of new cement projects. Check forecasts for internal demand. Inputs: four weeks by technical specialist partly in the field, 2-3 weeks by industrial economist partly in the field.

- International marketing

Advise on prospective outlets, prices, marketing channels and strategy, particularly for glass and canned food. Inputs: to be determined by the International Trade Centre, Geneva.



Annex I

PROJECT PERSONNEL

Team Leader and Co-ordinator: UNIDO staff member J. Barnerias; Ph.D. Economics; experience in development financing, market studies, industrial projects, gained in industry and international organizations; specialization in preparation, analysis and evaluation of industrial projects. Co-ordinated the work of the team, reported on progress of the Project, wrote the terminal report. Also wrote four financial-economic analyses.

Financial Analyst: UNIDO staff member H. Khouadja; graduate in political science and economics; experience in national development finance corporations and international bank; specialization in preparation and appraisal of industrial projects for financing. Wrote three financial-economic analyses.

Marketing Expert: UNIDO staff member K. Moll; M.A. business administration; experience as University professor of marketing, consultant in management, marketing executive in industry, international expert in marketing and project manager. Wrote eight marketing notes.

Technical Specialist in Pulp-and-Paper Industry: UNIDO staff member Mr. Jut; engineer, Ph.D. in paper making; experience in research in pulp and paper making, management of printing and writing paper mills, teaching at engineering school. Wrote the technical report on the pulp-and-paper project.

Technical Specialist in Nitrogen Fertilizers (Ammonia-Urea): UNIDO staff member, interregional adviser S. Fanfil; M. Sc. in chemical engineering; experience in management of large-scale chemical plants, design and management of nitrogen fertilizer plants (especially ammonia-urea), feasibility studies and contracting for fertilizer plants. Wrote the technical report on the ammonia-urea plant at Homs.

Technical Specialist in Vegetable Oil: UNIDO staff member H. Koenig; Chemical engineer; experience in the oil and fat industry in a number of developing countries and in planning and designing complete oil factories. Wrote the technical report on the vegetable oil projects at Deir-ez-Zor and Aleppo.

Technical Specialist for the Detergent Industry: UNIDO staff member C. Chiang; Ph.D. in chemical engineering; experience in developing and administration of chemical industries gained in industry and government agencies responsible for the development of chemical industries; also, experience in teaching chemical engineering at University level. Wrote the technical report on the detergent project at Damascus.

Technical Specialist in Vegetable Canning: UNIDO staff member H. Sepic; engineer in chemical technology, specialized in food industry; experience in study, design and management of cold storage, freezing plants and food canning plants, and in teaching food technology at University level. Wrote the technical report on the vegetable (and fruit) canning project at Hasakeh.

Technical Specialist in Cement Industry: UNIDO staff member C. Rydeng; M. Sc. in chemical engineering; experience in chemical industry, and in University as professor in engineering; specialization in development and administration of cement and building materials industry. Wrote the technical report on the cement industry development program in general and the new Hama plant in particular.

Technical Specialist in Glass Industry: Consultant M. Aqlan; Ph.D. in glass technology; experience in teaching at University level, management of glass manufacturing plants, planning and development of the glass industry. Wrote the technical report on the glass project at Aleppo.

Technical Specialist in Tyre Manufacturing: Consultant A. Ruecker; commercial engineer, doctor in economics; long experience first in the oil industry and later in the rubber industry; specialization in analyses and evaluation of techno-economic and market data relating to tyre manufacturing. Partly because of lack of reliable data, was unable to write a meaningful report.

Mr. P. Kukorelly, international marketing consultant from the Batelle Institute, recruited by the International Trade Centre, Geneva. The Consultant researched and wrote eight reports on the international markets for the eight industries analyzed.

Annex II

REPORTS

Ammonia-urea

- Technical report
- Marketing note
- International market report
- Financial/economic analysis

Pulp-and-paper

- Technical report
- No marketing note since marketing aspects already dealt with in technical report
- International market report
- Financial/economic analysis

Tyres

- Technical report
- Marketing note
- International market report
- Financial/economic analysis 2/

Glass

- Technical report
- Marketing note
- International market report
- Financial/economic analysis 2/

Cement

- Technical report
- Marketing note
- International market report
- Note on financial/economic appraisal

Detergents

- Technical report
- Marketing note
- International market report
- Financial/economic analysis

Vegetable oil

- Technical report
- Marketing note
- International market report
- Financial/economic analysis

Vegetable canning

- Technical report
- Marketing note
- International market report
- Financial/economic analysis

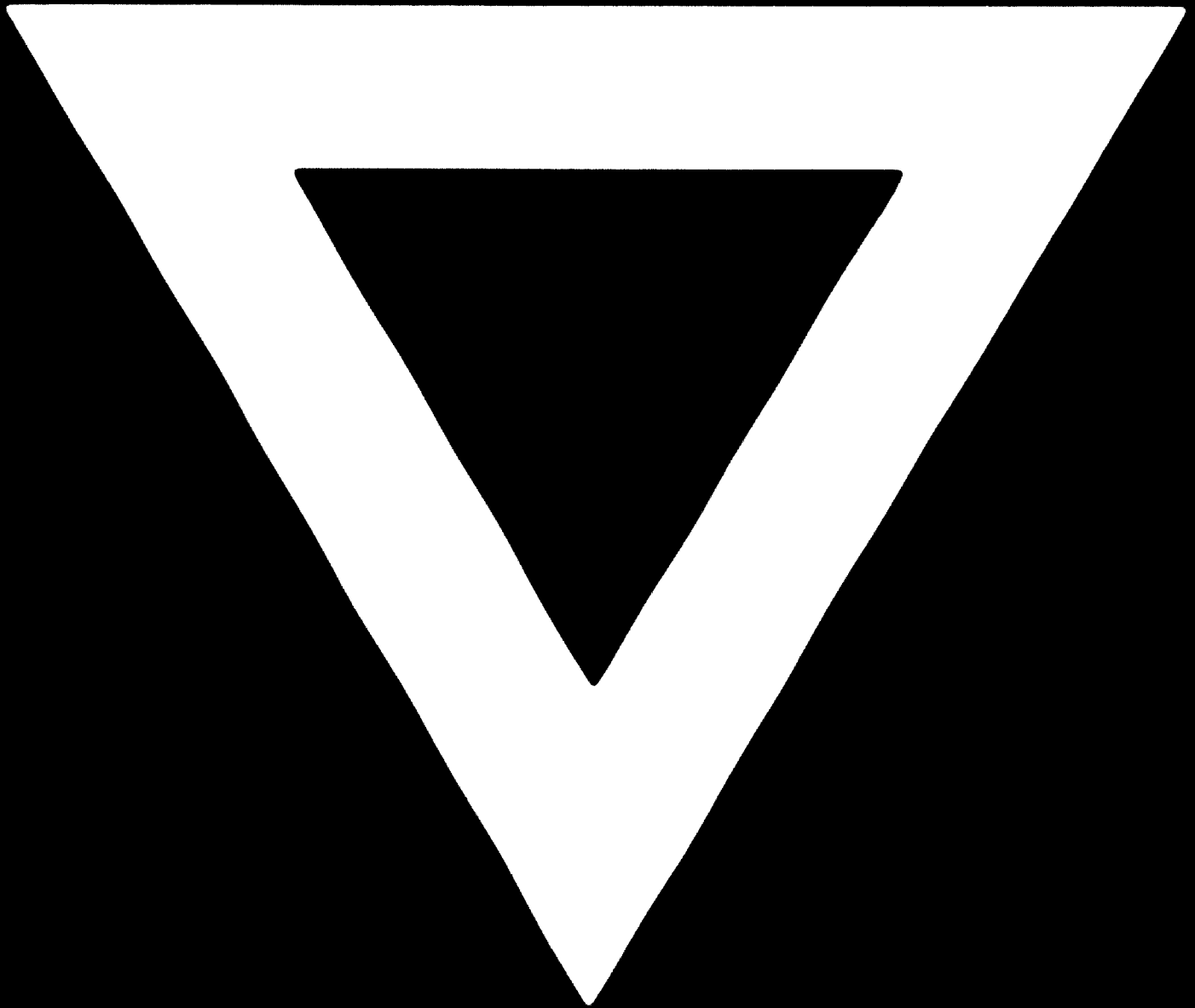
Marketing note on distribution channels in Syria

Terminal report

✓ This analysis is based on a May 1977 report by the Industrial Research and Development Centre in Damascus.

✓ The calculations in this analysis are based on the first technical report, a later revision of the technical report made minor changes in operating costs.

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