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FEASIBILITY STUDIES IN SUPPORT OF
INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE (IDWSSD)

DP/BUR/80/015

THE SOCIALIST REPUBLIC OF THE
UNION OF BURMA

Report of the in-depth evaluation mission*

Established in co-operation with the
United Nations Development Programme and the
United Nations Industrial Development Organization

United Nations Industrial Development Organization

Vienna

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Explanatory Notes

Unless otherwise indicated, the currency "dollar" refers to the dollar of the U.S.A..

The monetary unit of the Socialist Republic of the Union of Burma, sometimes referred to in the report as Burma, is the Kyat (K). During December 1986, the U.N. operational rate of exchange was US\$1 = 7.04 K.

The slash symbol (/) between two years, for instance 1984/85, refers to a fiscal year.

The dash symbol (-) between two years, for instance 1981-1985, refers to the period between the two years, including the latter.

The following acronyms were used in the present report:

IDWSSD	-	International Drinking Water Supply and Sanitation Decade
IPD	-	Industrial Planning Department (of the Ministry of No. 1 Industry)
NPD	-	National Project Director
CTA	-	Chief Technical Adviser
SIIPO	-	Senior Industrial Investment Project Officer
TOR	-	Terms of reference
tpd	-	tons per day
tpy	-	tons per year
RHA	-	rice husk ash
PE	-	polyethylene

The term project in the report refers, indistinctly, to either an industrial or a technical co-operation project.

The mention in the report in the text of titles of companies or name brands does not imply an endorsement on behalf of UNIDO.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

(i) The project under review was approved in May 1984 to follow-up on the recommendations of the "National Meeting on Strategy and Detailed Planning for the International Drinking Water Supply and Sanitation Decade" which took place in Rangoon from 6 - 11 January 1982. The recommendations concern the manufacture in Burma of plastic pipes and appliances, plastic pellets, steel pipes and cement to satisfy the goals of the Decade, namely that drinking water and basic sanitation be provided to 50 per cent of the country's population by 1990. The project aims at preparing feasibility studies in respect of said productions in order to secure grants to establish the plants, as well as to strengthen the capabilities of the counterpart staff in the preparation of feasibility studies.

(ii) The evaluation mission, which visited the project from 9 - 19 December, came to the conclusion that there is a certain degree of uncertainty as to whether the forthcoming feasibility studies results will be in a form acceptable and usable for the purpose anticipated by the Government, namely the securing of grants, unless certain corrective measures as recommended by the mission are taken.

(iii) Main factors affecting project implementation concern the different perception by the consultants and the Government on the meaning of "feasibility study", lack of clarity as to the role of consultants on the preparation of TOR and supporting studies and unclear design of TOR, particular in the economic analysis section.

(iv) The mission recognizes that the project is dealing with technologies which are not well proven, scales of production which are too small and plant locations which may be questioned. These were given parameters with little leeway. Furthermore, the place of the proposed plants within the national industrial development context is not clear.

(v) The project document is basically well designed and constructed but suffers from a too short duration and lack of a contingency plan. Government inputs were delivered satisfactorily but UNIDO inputs suffered delays because of internal procedures and long chain of the decision process.

(vi) The mission feels that a more explicit agreement between the Government and UNIDO is needed as to the purpose and meaning of "feasibility study" in the context and its relationship with the national industrial development programme.

(vii) The remaining feasibility studies should have the social cost-benefit analysis emphasized and determine the amount of subsidy needed to overcome eventual financial deficits.

(viii) The mission recommends to the Government that the possibility of using loans instead of or in combination with grants be explored. Despite the social goals of the IDWSSD, grants are normally not easily available for manufacturing units.

(ix) It is also recommended that the Government considers a scale, location and possibly technology different from the originally intended scope in the context of the IDWSSD, if the feasibility results positively indicate such alternatives as desirable in the context of a sound national industrial policy.

(x) Finally, the mission recommends that the submission of the final reports and the covering project management and headquarters, comments be carried out in a unified rather than piecemeal form.

INTRODUCTION

(1) The project document for "Feasibility Studies in Support of International Drinking Water Supply and Sanitation Decade" (IDWSSD)-DP/BUR/80/015 - was signed respectively on behalf of the Ministry of Planning and Finance on 30 April 1984, by the United Nations Development Programme (UNDP) Resident Representative on 10 May 1984, and on behalf of the United Nations Industrial Development Organization (UNIDO) on 3 April 1984.

The financing of the project was assured by the following contributions:

Government (in kind)	K.	400,000
UNDP (IPF)	US\$	1,300,000

A revision increasing the UNDP contribution to US\$1,535,500 was approved on 25 February 1986.

(ii) The execution of the project was to be assured, on behalf of the Government, by the Industrial Planning Department of the Ministry of the No. 1 Industry and, on behalf of the United Nations system, by UNIDO. The project, with a duration of one year and nine months, was supposed to have started in July 1984 and terminated in May 1986 but due to delays in implementation and extension of its duration, it started only in November 1984 and is now scheduled to terminate in July 1987.

(iii) The present in-depth evaluation was included in the project document in accordance with UNDP requirements to evaluate projects exceeding US\$1,000,000 in UNDP contribution. It was also recommended on the basis of the latest UNIDO Project Evaluation Report (PER). Terms of reference for the mission are included in annex I to the report.

(iv) The evaluation mission was composed of the following persons:

Mr. Seong-Jae Yu, Team Leader and Representative of UNDP
Mr. Oscar Gonzalez-Hernandez, Representative of UNIDO

Mr. Nyunt Hliang, Director (Project Planning) of the Industrial Planning Department, accompanied the mission throughout its meetings and deliberations, although he was not formally a member of the mission.

(v) The mission stayed in Rangoon from 8th to 19th December 1986 * and presented, before the departure, its preliminary findings and recommendations to a wrap-up meeting chaired by the Director-General of the Foreign Economic Relations Department. The attendance at this meeting is listed in annex III. Part III of the present report, as well as substantial portions of Part II, were drafted in Rangoon, thus enabling discussions with the interested parties on the recommendations drawn up by the mission. The list of persons met by the mission is included in annex II. The mission takes this opportunity to express its thanks to the persons met for the quality and frankness of the discussions and for the support it received from the project, the Director-General of IPD and the Office of the UNDP Resident Representative.

*/ The Team Leader arrived on 9th December 1986.

(vi) The mission submits in this document the results of the in-depth evaluation to the concerned authorities of the Government of the Socialist Republic of the Union of Burma, UNDP and UNIDO. This document is the result of the analyses of the information gathered, the documents placed at the disposal of the mission as well as of the conversations held. It is hoped that the recommendations drawn up herewith and their implementation will assist in ensuring that the project meets the expectations of the Government of Burma. To the knowledge of the mission, it is the Government's intention to use the studies resulting from this project to locate and secure capital assistance (grants or possibly loans), based on social goals rather than on purely financial considerations.

I. PROJECT FORMULATION

A. Brief History of the Project

1. The origin of the project may be traced to the National Meeting on Strategy and Detailed Planning for the International Drinking Water Supply and Sanitation Decade (hereinafter referred to as "National Meeting") which took place in Rangoon from 6 - 11 January 1982. The Meeting reiterated the goal expressed in the programme for the periods of the Fourth and Fifth Four Year Plans, whereby drinking water and basic sanitation would be provided to 50 per cent of the country's population by 1990. However, water supply and sanitation development projects were hampered by the lack of drilling equipment, pumping units (including prime movers), piping (steel and plastic pipes and accessories) and cement. To overcome these shortages and at the same time to reduce the foreign exchange requirements by 50 per cent, the National Meeting above suggested that the following production units be established:

(a) Four plastic appliances (pipes, fittings, latrine pans, etc.) extrusion plants, each of a capacity of 5 tpd of 1/2" to 8" pipes, located in areas of demand to reduce transportation cost;

(b) One batch type plastic pellets manufacturing plant of a capacity of 20 tpd using sugar cane juice and/or molasses or other appropriate locally available agricultural products as raw materials. This plant would be the source of inputs for the above;

(c) A welded steel pipe plant of a capacity of 5 tpd of pipes of various sizes made from locally produced steel;

(d) Several minor cement plants using appropriate technology based on paddy husks and limestone with a combined capacity of more than 100 tpd, located in points of demand to reduce transportation cost; and

(e) A factory (or factories) to produce various sizes and types of water pumps, air compressors, electric motors, petrol and diesel engines and water meters. ^{1/}

2. The present project is only concerned with the first four units. The National Meeting suggested that grant aid would be required to set up the production units. It was recognized that the proposed production units were very small by present standards. Therefore, they could not operate economically if their capital cost had to be paid for with foreign exchange loans, even on soft conditions. This is at the base of the Government's logic of establishing these production units with grant aid, so that production costs would be calculated without amortization.

^{1/} Initially to be the subject of a separate technical co-operation project, but later on the project proposal was dropped.

3. In order to obtain the capital financing needed for these production units, the Government needed to submit to prospective source of financing - grant aid donors - comprehensive and reliable technical and economic data on the identified projects. For this purpose, UNDP co-operation was requested and the relevant project included in the Country Programme. The first early draft project document was prepared by a UNIDO staff member as early as March 1982. The draft was changed in several discussions with the Government, mostly by the SIDFA, to reach approximately the present shape early 1983. Due to the internal procedures needed to clear and approve the document, the project was not approved until May 1984. It also appears that the change of key Government officials related to the project was also a reason for part of the delays. The project document approved in May 1984 foresaw the beginning of operations in July 1984. The National Project Director (NPD) was on post at that time but the Chief Technical Adviser (CTA), because of nonacceptance by the first choice, the immediate availability of the second choice (present CTA) not being assured and the cumbersome internal procedures needed to approve candidates by the Government, the CTA arrived in Rangoon only on 17 November 1984.

B. Socio-economic Setting of the Project

4. "When Burma launched its Fourth Four Year Plan covering 1982/83 - 1985/86 in April 1982, the country looked forward with confidence to four years of continued high growth supported by rapid increases in investment and rising domestic savings. However, while growth has proceeded at rates comparable to the last half of 1970's, serious financial imbalances have emerged as reflected in sharply reduced allocations for imports and large budget deficits which have resulted in unsustainable rates of domestic credit expansion and external debt service." ^{2/}

5. Against this background, the manufacturing sector has suffered because of stagnant investment and shortage of foreign exchange for inputs and parts. The gross production of the State and Co-operative owned manufacturing sector in 1984/85 was roughly at the level of 1982/83. However, private owned industry growth during the same period resulted in a share of gross output of 54.7 per cent in 1984/85 against 51.9 per cent in 1982/83.

6. The Fifth Fourth Year Plan covering 1986/87 to 1990/91 continues to be optimistic and new investments in the manufacturing sector adding to 33 per cent of total public investments are included. The manufacturing projects have a foreign exchange component of 51 per cent. The four industrial projects subject of the technical co-operation projects under review, are included in the plan. The mission was assured that the local costs of these projects were assured. Civil engineering works for the plastics extrusion plant have already commenced; however, the Mission was informed that the foreign exchange component of the four projects is expected to be secured exclusively by means of foreign grants.

7. The development objectives as stated in the project document indicate the following:

^{2/} Policies and Prospects for Economic Adjustment and Growth, World Bank, Nov. 1985: Burma.

- "(i) The Twenty Year Plan (1974-1994) gives high priority to economic growth and to improvements in the social sector. Ameliorations in nutrition, clothing, housing, education and public health are among the main objectives, with special consideration given to rural areas;
- (ii) Adequate water supply and sanitation are seen as prerequisites to health. Under the Fourth and Fifth Four Year Plans (1982/83-1985/6, 1986/87-1989/90) it is expected that fifty per cent of the population will be provided with safe drinking water and sanitation;
- (iii) The Fourth Four Year Plan gives also high priority to the establishment of domestic raw material based industries that work in support of other sectors of the national economy, inter alia, in support of the health sector;
- (iv) The project is designed to assist in achieving these national objectives which will also serve to save foreign exchange, to provide job opportunities and to raise incomes of the population."

These objectives are those recommended by the National Meeting and are included in the targets of the Fourth and Fifth Four Year Plans. However, the mission was unable to ascertain the place of the four projects within the national industrial development context, particularly in what concerns cement production where parallel investments in some of the existing plants are contemplated.

C. Project Design

Immediate objectives

8. The immediate objectives included in the project document are as follows:

- "(i) To provide national authorities with comprehensive and reliable technical and economic data indispensable to obtain capital assistance for the establishment of industrial plants for the production of equipment in support of the Water Supply and Sanitation Programme; and
- (ii) To strengthen the capability of Industrial Planning Department and respective Corporations of the Ministry Of No. 1 Industry in the preparation of industrial feasibility studies."

9. The objectives are clearly stated, although the capital assistance required for the establishment of the plants is not specifically stated as a grant, as recommended by the National Meeting. It may be also pointed out that to obtain capital assistance, studies at the level of pre-feasibility would have been preferable, since capital donors or lenders usually prefer to undertake full feasibility studies themselves or, at least, that such studies are prepared in accordance with their formats under their supervision. For example, one representative of a traditional donor country for Burma, informed the mission that his country would not consider a grant/loan on the basis of a feasibility study prepared by a third party.

Background and justification of projects

10. This part of the project document is well stated and recaptures the portions of the Third Four Year Development Plan related to water supply and sanitation needs as well as the recommendations for the production units drawn up by the National Meeting. The immediate objective related to the obtention of capital financing is again expressed here, this time with the indication that a grant is preferable.

Outputs

11. The outputs indicated are in relation to the two immediate objectives, namely the feasibility studies and the trained personnel of the Industrial Planning Department and respective Corporations of Ministry of No. 1 Industry.

Activities

12. The activities are presented in the project document in relation to the corresponding outputs: studies and training. The breakdown of activities is detailed enough but suffer from a few deficiencies:

- (a) The preparation of terms of reference for additional support surveys and reports required to pave the ground for the feasibility studies is timed as the preparation of the feasibility studies themselves. There should have been a time gap in between to adjust the feasibility studies on the basis of the results of the support survey and studies. The need for this gap is substantiated by the existence of doubts, right from the start as to the viability some of the technologies and scales of production and even locations initially chosen by the Government;
- (b) Ideally, a contingency plan should have been built into the project to allow not only the preparation (or not) of feasibility studies, according to possible adjustments recommended by the support surveys and studies but also and, principally, to allow the preparation of the feasibility studies in a parametric form, by phases, permitting adjustments based on preliminary results and to bring in the donors/lenders of capital financing, at the earliest possible stage of the full feasibility study.
- (c) The changes as indicated before would have extended the project in duration but not increase the budget significantly, apart from a longer duration for the CTA. In fact, this happened during implementation.

Adequacy of resources to objectives

13. Taken the objectives as given, resources indicated in the project document, both UNDP and Government are adequate with the sole exception of a longer duration for the CTA, as indicated in the precedent paragraph. No particular comments are offered on the sections of the project document dealing with "Preparation of the Framework for Effective Participation of National and International Staff in the Project" and "Institutional Framework" which are clear and adequate.

II. PROJECT IMPLEMENTATION

A. Delivery of Inputs

UNDP/UNIDO

14. As of 31st December, 1986 the status of the delivery of UNDP/UNIDO supplied inputs is shown in Table 1. The differences between the original budget and the last revision reflect the following changes:

- (a) Post 11-01 was extended by 15 months to be in line with the extension of the project;
- (b) The budget for short-term consultants under 11-50, was roughly doubled because the original allocation for seminars (US\$96,000) under 32-02 was used up for short-term consultancies, still for the same purpose;
- (c) The Sub-contract component suffered a slight increase to accommodate as better estimation of costs;
- (d) The Fellowship component (31-99) more than doubled to accommodate additional fellowships on technical aspects of some of the plants;
- (e) The Equipment component suffered a revision from US\$60,000 to US\$97,000 to allow the purchase of a personal computer, programmes for local training and a micro-bus for the transport of local personnel.

Government inputs

15. The project budget covering the Government contribution is included in the project document as follows:

		TOTAL	
		m/m	K.
10	<u>PROJECT PERSONNEL</u>		
11	<u>National Project Personnel</u>		
11-01	National Project Director	21	31.5
11-02	Senior Industrial Investment Project Officer (Plastic Pipes)	21	21.0
11-03	Senior Industrial Investment Project Officer (Plastic Pellets)	21	21.0
11-04	Senior Industrial Investment Project Officer (Steel Pipes)	21	21.0
11-05	Senior Industrial Investment Project Officer (Cement)	21	21.0
11-06	Investment Promotion Specialist	21	21.0
11-07	Technical Consultants	8	12.0
11-08	Administrative Officer	18	9.0
11-09	Senior Secretary	18	5.4
11-10	Typist	18	3.6
11-11	Drivers (2)	36	7.2
19	Component Total		173.7
50	<u>MISCELLANEOUS</u>		
59	Component Total		226.3
99	Project Total		400.0

Table 1

Delivery of UNDP/UNIDO Inputs

		<u>Original Budget</u>		<u>Revised Budget</u> ^{3/}		<u>Spent, obligated</u> <u>or committed up</u> <u>to 31.12.86</u>	<u>Uncommitted</u> <u>Balance</u> <u>as of 1.1.87</u>
		m/m	US\$	m/m	US\$		
11-01	CTA	18	133,200	33	223,440	170,742	52,698
11-50	Short-term Consultants	12	96,000	26.1	176,580	176,471	109
13 thru 16	Other personnel expenditures		60,800		53,608	31,071	22,537
29-99	Sub-contracts		770,000		830,246	167,322	662,924
31-99	Fellowships	20	42,000	<u>4/</u>	96,240	79,639	16,601
32-99	Study Tours and Seminars		108,000		21,330	3,520	17,810
49-99	Equipment		60,000		97,000	92,593	4,407
59-99	Miscellaneous		30,000		37,056	24,338	12,662
Total			1,300,000		1,535,500	745,696	789,804

^{3/} Budget Revision "G" of 21 October 1986.

^{4/} m/m not indicated in revision.

16. These inputs have been provided in quantity, quality and timing well above forecasts. The National Director is in place since the date indicated in the project document for starting the project, even if the project manager had not yet arrived. The other counterparts, some of them interviewed by the evaluation mission, have relevant background education (economists or engineers) and practical experience (either in the Corporations or the Planning Department of the Ministry) and are highly motivated and committed to the goals of the project.

B. Implementation of Activities

17. The activities mentioned in the project document have been implemented as planned, albeit with delays due to:

- (a) Unrealistic timing in the project document as indicated in paragraph 12;
- (b) Doubts on feasibility of technologies chosen by the Government in respect of plastic pellets plant and mini-cement plants; and
- (c) Delays in personnel recruitment and sub-contract awards by UNIDO and their acceptance by the Government.

18. It is possible that the causes for the delays will persist and the foreseen termination date of the project of July 1987 will not be met. A further slip of a around three months for the termination of the project is estimated by the mission. References in this report to the termination date of the project refer to this revised target.

19. The present implementation status in regard to the activities in the project is as follows:

(i) Plastic pipes and appliances plants

Presently in phase "f".
Completion is estimated for March 1987;

Plastic pellets plant

Phase "d" - presently being completed.
Doubts on the technology may push the termination of this activity to the end of the project;

(ii) Welded steel plant

Phase "f" - completed.
Study needs to be revised to include economic analysis and should be terminated in March 1987;

(iii) Mini-cement plants

Phase "e" - completed.
A study tour on mini-cement plants to further analyze the technology chosen by the Government is needed. Completion of the study is foreseen by the end of the project;

(iv) + (v) Fellowship training and study tours

Implemented satisfactorily. However, the original plan to start the implementation of the Training Programme before the arrival of the CTA did not materialize. A number of fellowships and/or study tours (plastic pellets, mini-cement plants and financial management, to quote only the most significant ones) will be implemented during 1987; and

(vi) Seminars

Completed in December 1986.

III. PROJECT RESULTS AND ACHIEVEMENT OF OBJECTIVES

A. Project outputs

20. Two types of outputs are expected from the project: (a) feasibility studies and (b) training of the Government officials. The feasibility studies are to be conducted on four projects.

21. Of these four studies, only the study on the welded steel pipe plant has been completed at the moment of this mission's report writing.

22. The study on the plastic appliances extrusion plants has been modified to the analyze a pilot production unit and is now under investigation by the consultants, Baldo and Co. The result is expected to be submitted to UNIDO by March 1987.

23. For the other two studies, awards of sub-contracts to consultants are yet to be made. According to the CTA, the best estimate for completion of the studies on mini-cement plants and plastic pellets plant is May 1987, provided the selection of consultants are made by February 1987. The actual completion date may slip to the end of the project due to the doubts on the technologies chosen.

24. In order to produce feasibility study results on these proposed plants, various intermediate outputs were generated by the UNIDO consultants and the national project team. They included the terms of reference (TOR), market support studies, technical reports, and consultants' work reports which contained valuable information and data useful for feasibility studies later. (See annex IV for specific titles of these reports.)

25. As for training, the second component of the project outputs, a total of five activities were planned and executed with success:

(i) The First Training Seminar on feasibility studies held in May 1985 for 27 specialists from the Industrial Planning Department of the Ministry of No. 1 Industry and the various Corporations under the Ministry;

(ii) The Second Training Seminar on preparation, evaluation and financing of industrial projects held in November 1986 for 25 specialists from the Industrial Planning Department of the Ministry of No. 1 Industry and the various Corporations under the Ministry;

- (iii) The Seminar on COMFAR (UNIDO's Computer Model for Feasibility Analysis and Reporting) for 8 trainees for 2 weeks ended on December 5, 1986;
- (iv) Five participants for the Fellowship Programme (the National Project Director and four representatives from the four feasibility study areas) completed their training during the first half of 1986 and produced reports; and
- (v) The Study Tour of three high-level Government officials to the Federal Republic of Germany, Switzerland and Austria in September 1986 to visit plants, discuss technologies and possible involvement of foreign firms in the plants.

B. Achievement of Immediate Objectives

26. The project has so far partially achieved the first intended objective. Of the four feasibility studies, the one on welded steel pipes has been completed and the results of the other three are expected to be delivered between the first half of 1987 and the end of the project. Apart from the final output reports, a vast amount of technical and economic data has been generated during the course of implementation of the project. This information could be used, if necessary, in reformulating or modifying the investment plans later on.

27. It is too early as yet to judge whether the project will completely fulfill the immediate objectives. However, based on the reasons described in the following section, the mission is of the opinion that there are a number of causes which appear to contribute toward making the project outputs less than satisfactory to the Government, if the presently adopted TOR are adhered to by the consultants. The causes identified in this report may look small and subtle, but the effect could be significant enough and capable of making the outputs of this project more effectively achieved.

28. As for the second objective, the training programme appears to have achieved it successfully by means of strengthening the capability of the Government officials in the preparation of industrial feasibility studies. The mission has confirmed that the trainees are continuously involved in the project and productively contributing towards the goals of this project.

C. Contribution to the Achievement of Development Objectives

29. Since the project is still in progress, it is too early to assess its contribution to the achievement of the development objectives. As implied under section III.B, the likelihood of impact of the project depends on a number of actions recommended at the end of this report. With viable outputs from this project, together with the commitment which the Government has made to it, it should be able to contribute towards the development objectives.

D. Factors Affecting the Project Implementation

(a) General factors

30. Based on the discussions with the CTA, the NPD, the Government officials, the SIDFA, the UNDP representative, and other project personnel, the mission is of the opinion that, although the project has so far partially achieved its immediate objectives, it may not be able to achieve them fully within the timeframe set in the project document, due to the complexities and uniqueness arising from the conditions of the "within Burma" context. Furthermore, the mission is of the opinion that the project is still in a state of fluidity as to the contents and characteristics of the remaining feasibility studies and therefore there is a considerable degree of uncertainty as to whether the forthcoming feasibility study results will be in the form acceptable and usable for the purposes anticipated by the Government.

31. The mission is also of the opinion that the project team and the supporting organizations have extended hard and conscientious efforts in implementing the project. The progress of the project has been meticulously documented and it has appreciably expedited the mission's evaluation work. The project, however, has defied to render itself to a satisfactory conclusion within the timeframe of the project document. Among the many problems and causes that have been identified by the mission, the following reasons, singly or in combination, appear to have most critically contributed toward the less than satisfactory results of the project up this date:

- (a) Different perception by the consultants and the Government with respect to the meaning of "feasibility studies", forming the main outputs of the project;
- (b) Lack of clarity as to the role of consultants and specialists who were expected to produce "terms of reference" for feasibility studies;
- (c) Unclear design of "terms of reference" - particularly in the economic analysis section - which would result in confusion of the formulation of content and characteristics of the feasibility study so far undertaken and which may end in the feasibility studies not likely being useful in fulfilling the objectives of the project;
- (d) Slow process of recruitment of consultants; and
- (e) Long chain of decision process involving UNIDO headquarters, UNDP Rangoon and the Government.

Different perception on the concept of feasibility study

32. Although the term "feasibility studies" appearing on the project title has been used throughout the project period, it seems that it has been differently understood and implemented by the consultants and thus by the executing agency from the meaning anticipated by the Government. This difference in perception, though seemingly small and subtle, seems to have caused considerable misunderstanding and confusion, which have contributed toward building uncertainty as to the usefulness of the outputs of the project.

33. The internal documents and reports generated during the project implementation period indicate that the UNIDO consultants have used the term "feasibility studies" mainly in the conventional sense of the word, i.e., the financial viability of the proposed projects. In fact, the terms of reference prescribe the approach and methodology established as a standard by UNIDO and as embodied in the "Manual for the Preparation of Industrial Feasibility Studies". The purpose of this Manual is to show how to analyze the financial profitability of industrial projects with no emphasis on the social cost-benefit analysis.

34. On the other hand, the Government seems to use the terminology in a loosely defined way but with strong social orientations to serve its intended purpose. The Government seems to have known from the beginning that the scale of projects as proposed in the project document would not be viable in an ordinary sense of financial profitability. The project, which was formulated as a direct offspring of the National Meeting, has social objectives of providing 50 per cent of the country with potable water and sanitation. Since the project has social objectives, the evaluation criteria were expected by the Government to be different from the ordinary commercial feasibility. Discussions with the responsible Government officials revealed that the Government took the following positions with respect to the scope of the projects:

- (a) The scope of the projects would be confined to the context of IDWSSD and not in the context of the national industrial development policy; and
- (b) The projects would be primarily financed by grants and aids rather than loans.

35. Although these positions might have been inferred from the title of the project document "Feasibility Studies in Support of the International Drinking Water Supply and Sanitation Decade" and one of the paragraphs in the project document (para. 15), they do not seem to have been made explicit to UNIDO consultants, who therefore have focussed on the word "feasibility studies" in a commercial context rather than on the implications of IDWSSD and the intended mode of financing. The mission was informed by the National Project Director and subsequently confirmed by other responsible Government officials, of the reasons why the Government took these positions:

- (a) The foreign exchange constitutes the paramount constraint for any industrial development project;
- (b) The Government policy of meeting the social goal of the IDWSSD has been to rely on grants and aids from foreign sources rather than through allocation of the scarce foreign exchange resources. (This position was confirmed by the Government during the Tripartite Review Meeting held on 20 November 1985.);
- (c) To make grants and aids expeditiously available, the Government wanted to keep the plant scale as minimal and humanitarian as possible, which has led to confine the project to the IDWSSD context;
- (d) The social objective of fulfilling the 50 per cent target under the IDWSSD was nonetheless considered important and thus the projects have been included in the Fifth Four Year Plan. The implementation could be delayed if the projects were treated in the national industrial planning context and became too late.

36. These positions have apparently led the Government to hope that the "feasibility studies" by the UNIDO consultants would produce a set of documents substantiating and justifying the "mini-projects" as proposed in the project document, which would expedite securing of grants and aids. Therefore, the perception of the Government with regard to "feasibility studies", was inclined towards social cost-benefit analysis formulated in such a way as to be conducive to favorable decisions on the part of the grant donor countries.

37. These aspects were not explicitly specified in the consultants' job descriptions, although the National Meeting stated that the projects would have to be financed through grants and aids (page 13 of the Proceedings) and UNIDO has tacitly understood that the projects would be confined to the context of the IDWSSD and the project document discreetly referred to the preference of aids over loan arrangements.

38. The important point is not whose perception of feasibility studies is right but to know for what purpose the feasibility studies are to be conducted. After all, studies are meant to be done to help decision makers. In this case, the decision makers are potential donor countries as well as the Burmese Government. Therefore, the end result of the feasibility studies of this project have to be in contents and characteristics related to decision variables which should be more than just financial profitability. For example, the Government or the donor country might want to know such things from the study reports as:

- (a) What social benefits would be accrued if such plants are built?
- (b) How much of subsidies would have to be made to support such plants designed to fulfil social objectives?
- (c) How the social cost-benefit analysis would be affected if investment scale is altered?
- (d) How much of foreign exchange would be annually required and also saved under various alternative investment plans? and
- (e) How would costs be affected if soft loans are arranged instead of or in combination of grants?

Role of consultants on terms of reference

39. The project document envisaged, albeit loosely, that consultants would complete terms of reference in a two month period, which would be used as a basis for full-fledged feasibility studies. However, the preparation of TOR has caused misunderstandings between the consultants and the Government and even delay in implementation. Consultants have typically produced two outputs: one was TOR for feasibility studies and the other was a report covering his activities and observations made during the period of his assignment. This second report have caused misunderstandings because it was tantamount to pre-feasibility studies influencing the course of the project at mid-point. It was admitted by UNIDO headquarters in Mr. Vassiliev's memorandum dated 1 July 1985 to the UNDP Resident Representative in Rangoon on the Plastic Pipes Reports which stated that (a) it was more than required in his job description and (b) it is a kind of pre-feasibility study. The consultant who was assigned in September 1986 to revise the TOR on the mini-cement plants prepared, in addition to a revised TOR, a report entitled "Feasibility of Setting Up Mini-Cement Plants in the Socialist Republic of the

Union of Burma" with a definitive statement that the mini-cement plants as proposed in the project document would not economically viable, which caused confusion in the Government's mind. Although this report posed certain technical validity it was somewhat misplaced in the context of the project. More important than that, it was not well explained and introduced to the Government and, therefore, was misunderstood.

40. While a mid-course adjustment based on preliminary information would be desirable toward a larger production unit, the project design did not seem to have envisaged the allowance of far-fetching conclusions to be made during the stage of TOR preparation. The problem was even compounded because the positions the consultant took were in the context of conventional meaning of feasibility studies which were not in line with the concept shared by the Government, as discussed above.

41. An alternative approach could have been that the consultant directed the attention of the feasibility study team to the aspect that he considered important requiring full investigation, rather than making premature conclusions (not having sufficiently explained or well introduced such conclusions to the Government).

Clarity of terms of reference

42. The design and clarity of TOR dictate the content, characteristics and quality of the final project output, i.e, feasibility studies. However, the terms of reference generated from the project seem to have problems which have contributed not only to the delay of the project progress but also may lead to questionable usefulness for the Government of final study results. The problems of the original TOR produced by consultants were:

- (a) Too much emphasis on and preoccupation with the estimation of market and demand analysis;
- (b) The style and content were not in line with the standard form of terms of reference readily usable for awarding a contract to consulting firms;
- (c) Did not have necessary emphasis on the social cost-benefit analysis; and
- (d) Did not clarify certain conditions germane to the objectives of the project as perceived by the Government.

43. Some of these terms of reference were subsequently rectified and improved by UNIDO when reviewed by the headquarters's staff. However, certain problems seemed to have remained in the final version of the terms of reference, particularly in what concerns social cost-benefit analysis.

44. The importance of market and demand cannot be overemphasized in ordinary feasibility studies. However, in the case of this project, the meaning of demand and market seems to require a special interpretation because (a) the Burmese economy is a centrally planned economy where the function of market mechanism is limited compared to open economies; (b) demand is latent rather than expressed; and, furthermore, (c) demand is to be created through the Government programme to fulfill social objectives of meeting the 50 per cent target of the IDWSSD. While these aspects were recognized in the consultant's reports, the fact that they were oriented with the conventional definition of feasibility studies, not within the concept perceived by the Government, has apparently led the consulting firms to emphasize the market dimension more than it deserves.

45. The original TOR prepared by the consultants were not in shape and content, except for the TOR for the steel pipes project, to be used without further modifications and improvement. This has caused additional turnarounds for interaction and communication between UNIDO headquarters and the Government, which contributed to the delays before awarding contracts to consulting firms for feasibility studies.

46. As indicated earlier, the meaning of feasibility studies was perceived by the consultants in the context of financial viability and, therefore, did not give enough attention in designing TOR, to the kind of information which would satisfy the needs of decision makers, i.e., the types of information potential donor countries and the Government would normally seek. This would have required the report of the final feasibility study to include information on the social cost and benefits, presented in a parametric form, so that the decision makers could identify the desired parameters with respect to investment scale and the level of subsidies, if required. For example, a potential donor country would wish to know before deciding on grants and aids that, even if the project is too small to be financially viable in ordinary sense, how much and in what way the grants and aids would help the recipient country, at various levels of grants; and the Government would also wish to know the subsidies required to achieve the social goals of the IDWSSD by running a small scale plant. Under the present form of TOR, if the final report happens not to be in line with the described parameter range, the whole output tends to be discounted by the Government as unsuitable for the purpose as it happened with the first study submitted to the Government. Ideally the Government should have approached donors first with a pre-feasibility study or opportunity study and, only when an agreement in principle would be reached, would the Government proceed to carry out feasibility studies in line with the requirements of the donors. Since this sequence has not been opted, a parametric approach with respect to the needs for information would have been more viable for the project.

Slow process of recruitment

47. As indicated in the Project Progress Reports, the recruitment process was in many cases more time-consuming than anticipated. This slow process, compounded by the long chain of decision process of the project, has contributed to the overall delay of the project implementation.

Long chain of decision process

48. The project seems to have a long chain of decision process involving various parties, which considerably have contributed to the delay of the activity implementation. Even for minor decisions, the following steps are required: The consultants, CTA, NPD, → UNIDO Vienna → UNDP Rangoon → the Government (Foreign Economic Relations Department of the Ministry of Planning and Finance → Industrial Planning Department of the Ministry of No.1 Industry → Minister/Cabinets. For example, the selection of every consultant has to be approved by the Cabinet. Along the chain of this process, UNDP Rangoon would not normally take much time, but UNIDO headquarters would take longer time by the nature of their operation and procedural requirements. Whenever unanticipated events occur, requiring clearance from the respective authorities, this long chain of decision process has to be activated and the project is further delayed. For example, the long decision chain needed for the appointments of Messrs. A. Grisar, R.W. King, J. Brzezinski, R.H. Irvine as supplementary consultants and for the approval of their reports were not envisaged in the project document.

(b) Plastic Pipes and Fittings Project

49. The consulting firm in charge of this study has completed the field trip and the draft final report is expected by March 1987. The resulting project appears feasible. It uses two extrusion units for pipes (HDPE and PVC) and one injection moulding for fittings. Investment needs were indicated by the firm's field personnel to be around \$3.5 million (out of which \$2.5 million in foreign exchange).

50. A plastic laboratory, as a department of the above production plant, will need equipment in the region of \$200,000 as suggested by the project consultant, Mr. J. Brzezinski. The production plant is expected to be submitted to UNDP for financing as a pilot and demonstration unit. The Government has already started the construction of the necessary buildings.

(c) Plastic Pellets Project

51. The Government wants the project to analyze the feasibility of the production of polyethylene pellets only using sugar-cane as the base raw material (in FERD's letter of December 1986: "Ministry of No.1 Industry would like to undertake the Feasibility Study on Plastic Pellets Manufacturing only on the agro-based technology".) Although the technological possibility exists, some experts on the subject (including the UNIDO established Plastics Research Centre in Bangladesh) are doubtful on its economic/financial feasibility. It is claimed that such productions exist but none of the persons interviewed by the mission (including the participants of related study tours and fellowships) actually saw a plant covering the full production line from molasses to PE. A polymerization plant producing polyethylene from ethylene (ethylic alcohol derived) in São Paulo, Brazil has been shut down. To our knowledge, no fellowship or study tour is envisaged to visit a plant where such a production exists (apparently in India). Such a visit should be undertaken and include the related SIPO.

52. Still UNIDO is going ahead with a call for offers for a Feasibility Study of a plastic pellets plant based on sugar-cane. Terms of reference and a short list of invitees have been cleared by the Government. The terms of reference state, in addition, that "an alternative solution to produce plastic pellets out of natural gas should be compared with the agro-based route". There are sound reasons to propose this alternative, but this has not been requested by the Government (see para. 55), although these terms of reference including the non-agro based alternative, were cleared by them.

(d) Mini-Cement Plants Project

53. Among the four projects, this is by far the most controversial and delayed one despite the fact that UNIDO has provided two consultants for TOR (Messrs. George R. Gouda and Alexander Grisar) and a UNIDO staff member for technology assessment (Mr. C. Rydeng). This project is still awaiting selection of a consulting firm for feasibility study. According to the latest schedule suggested by the CTA, the award for sub-contract for feasibility study is expected in February 1987 and the final study result is anticipated in May 1987, but slippage is expected.

54. There were three major events which have contributed to the slow implementation of the project. First, the TOR prepared by Mr. G.R. Gouda who was the first consultant and who arrived in Burma in February was not in a form readily usable by a feasibility study team. The output was more like a pre-feasibility study, containing information, data and even analyses useful for a full-fledged feasibility study. It failed to take the form and content of a formal TOR, which contain in particular terms and guidelines for economic analyses. Second, a Government laboratory (i.e., the Development Center for Ceramic and Cement Technology) confirmed and later was supported by UNIDO that the rice husk ash (RHA) based cement was not suitable for the water supply and sanitation programmes under the IDWSSD purposes. As a result, the Tripartite Review Meeting held in November 1985 decided to replace the RHA cement with portland cement mini-plants, each ranging 100-200 tpd capacity. Third, Mr. A. Grisar, a second consultant appointed for the revision of the TOR, arrived in Burma in September 1986 and submitted a revised TOR early November 1986 together with a report which showed a negative prospect for the mini portland cement plants and alternatively recommended a 250,000 to 500,000 tpy capacity plant for consideration. This report apparently has caused confusion and frustration on the part of the Government, which had not expected to see a feasibility report with de facto negative conclusions at this stage of the work, but a TOR which specifically referred to the proposed mini-cement plants. To show the issues involved, it is worth quoting a few statements from the Minutes of a meeting held on 26 November, 1986 on the occasion of the visit of Mr. M. Kulczycki, UNIDO backstopping officer.

(Quote) Dr. Kulczycki replied that Mr. A. Grisar's mission had ended with a negative conclusion and that the Feasibility Study---seems not to be justified to be undertaken because of the lack of viability according to his report. For the time being, UNIDO is verifying Mr. Grisar's report together with his assumptions and formulae; the final position would be officially informed by UNIDO before the end of December 1986, when the assessment is completed.

The National Project Director---saying that /Mr. Grisar/ was very eager for introducing a commercial scale cement plant and spent a long of time conducting market analysis, transport studies to support his initial idea instead of studying for TOR for Mini-Cement Plants; as the Ministry of No. 1 Industry had more than two Feasibility Study reports already prepared for the large scale cement plants, introducing of studies on large scale plants could be considered waste of money and time. He would like to insist that UNIDO carry on its activities in order to undertake full-fledged Feasibility Study on Mini-Cement Plants. (Unquote).

55. The mission is of the opinion that the delays and confusion over the cement project are the result of the combined effects of some of the reasons identified earlier in this evaluation report (section III.D), i.e., (a) there was a bias toward the commercially oriented feasibility study approach instead of toward the project's social objectives in the context of the IDWSSD, and not giving enough attention to the foreign exchange constraint faced by the Government; (2) the consultant, who was appointed for the preparation of TOR, attached too much significance on the findings from the preliminary investigations as to the viability of the projects, instead of adhering to his original task of preparing a TOR for the Mini-Cement Plants; (3) slow process of recruitment of consultants; and (4) a long decision process on the part of UNIDO and the Government. The mission was assured by the Government of the availability of natural gas in the two locations pre-selected by the Government for the gas-fired mini-cement plants.

(e) Welded Steel Pipes Project

56. This is the only project which had produced its feasibility study result when the project evaluation mission was in Burma. The early completion of TOR, which was approved in May and July 1985 by UNIDO and the Government respectively, was partly responsible for this result. The report submitted by the consultants, Eisenbau Essen GmbH., was formally accepted and approved in October 1986 by UNIDO and transmitted to the Government to this report for their review. A formal response from the Government is still pending as of this mission's report writing. However, during the discussion with the Government officials, the mission received an impression that the Government perceived the study results unfavorably, which may be summarized as follows: (1) the production capacities of 81,883 tpy and 112,139 tpy under the two alternatives suggested in the report are too high, as compared to the original capacity of 5 tpd or 1500 tpy proposed in the project document; (2) the suggestion of export for excess production seems unrealistic both in terms of international market conditions and the Burmese expertise and institutional support system relative to export activities in steel products; (3) the foreign exchange component needed for raw material inputs (approximately 10-15 million U.S. dollars per year) is high to accept; and (4) at such a large capacity, it will be extremely difficult to secure the grants necessary to finance the project.

58. Interestingly, the correspondence and internal memoranda reveal that the report received favorable remarks by UNIDO in terms of analysis, logic and presentation. According to the report the project would generate very high investment returns with 37 per cent and IRR respectively for the two proposed alternatives. It also shows that even if export is precluded, the breakeven production volume would be at 84 per cent of the plant capacity with the IRR of 23 per cent, although the sensitivity analysis shows that the breakeven point is highly elastic with respect to small changes in raw material costs and sales revenues. The report recommends:

(Quote) It is economically feasible to build a large diameter welded steel pipe plant in Burma---In the first year of production the plant will earn the capital costs for repayment of foreign currency loans even if the plant operates at only half capacity.... The foreign exchange outlays will be reduced through foreign exchange earnings achieved through exports. (Unquote)

59. Despite the positive recommendations of the feasibility study, the Government's negative reaction, albeit unofficial, suggests that there is a discrepancy in perception as to the nature and scope of the project and its feasibility study. It seems that the Government has expected the feasibility study to adhere to the scope defined by the objectives of the IDWSSD within the context of the "Burmese economy" whereas the consultants have interpreted their task as testing the commercial viability of the project in an ordinary sense of industrial investment. In the opinion of the mission, the following should have been properly taken into consideration in their analysis by the consultants: (a) the fact that the Government considered the project in a small scale in the context of the IDWSSD, not in the national industrial scale; (b) the foreign exchange was a critical constraint; (c) as for the mode of financing, grants were explicitly preferred to loans; and (4) the Government implicitly wishes to see in the feasibility study report the social cost and benefit analysis in the context of achieving the target of the IDWSSD. Apparently, the Government was disappointed to see a report which showed too high an investment requirement beyond the reach of grants and aids. One may argue that if the feasibility study shows sufficient cash flows and high returns, then it will be economically sound to proceed with the project even with borrowed capital. However, in the context of the "Burmese economy", the argument could be less persuasive, because (i) the loans would adversely affect the debt capacity of the nation; (ii) the opportunity cost of the borrowed capital for initial investment and the foreign exchange component required for raw material inputs for annual production activities would be too high and thus disturbed the priorities of the use of foreign exchange. The mission recognizes, however, that production cannot be scaled down indefinitely and often there is a minimum production threshold as seems to be the case here. This point is not sufficiently stressed in the study.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

60. The following are the conclusions the mission has reached, based on the observations, discussions and inference.

General conclusions

- (1) The project document seems well constructed in logic, framework and contents with inputs appropriately defined. However, the project document would have been better if the following factors were taken into consideration: (a) relationship of the projects in support of IDWSSD with the national industrial development context; (b) better timing and role definition of consultants in preparing supporting studies and TOR for pre-feasibility studies; and (c) a contingency plan that would have been activated when the output falls short of the expected level.
- (2) The work plan appears well organized and prepared except that (a) it lacks a contingency plan; and (b) the role and sequence of additional information collection steps as defined in the project document were not properly defined and timed (too compressed) in relation to preparation of TOR and full feasibility studies.

- (3) The Government inputs were delivered satisfactorily in terms of timing and quality in accordance with the project document. The mission has particularly noted that the Government officials assigned to the project on a full time basis are all highly competent and dedicated.
- (4) The UNIDO inputs were delivered satisfactorily in terms of hardware equipment and training components, but there have been considerable delays in recruitment and awards of sub-contracts for feasibility studies. The services of consultants have not always been well structured in terms of arrival and use of their expertise.
- (5) The Government appears to give the highest significance to the constraint of foreign exchange factor. The Government also appears to have a policy where the required foreign exchange component for fulfilling the social objectives set in the IDWSSD be met by projects financed by grants and aids although soft loan arrangements do not seem to be completely ruled out. The logic of these two factors have led the Government to the position with respect to this project that scale of projects be confined to the context of IDWSSD and hence small. However, the mission feels that the Government position that this project be confined to IDWSSD and not linked to national industrial policy has long term implications for later investments in national industrial projects. In fact, the IDWSSD projects, even though small, would take away certain market which would have constituted for the larger market for the national projects later and thus make the national projects more economically viable in the context of the small Burmese economy. Sometimes it will be difficult to study the feasibility of a plant outside the national context. The comments drawn up by UNIDO in Mr. Vassiliev's letter to Mr. Kitatani of 16 January 1987 on the subject of cement go along this line of thought.
- (6) The concept of feasibility studies as perceived by the Government seems somewhat different from that of UNIDO consultants. The Government appears to have understood the feasibility studies as a means of producing a set of documents substantiating and justifying the securing of grants and aids from potential donors for the required foreign exchange for investment, whereas UNIDO consultants used the term in a conventional technical and financial viability test. The Government perception is a logical consequence of the position taken as explained under (5). This difference was not clearly reconciled in the TOR. Although technically one may claim that the reconciliation was made because the Government has approved the TOR, the mission discovered that the difference has not been explicitly clarified with the Government. The consequence of this difference of perception, together with the lack of clear understanding on the part of consultants as to the scope of the project confined to IDWSSD, has been manifested in the Eisenbau Essen GbmH. Report on the Welded Steel Pipe Plant which suggested plant capacity beyond the need of IDWSSD objectives and showed only the financial profitability, not the social cost-benefit analysis.
- (7) The priority given by the Government to the production units in support of the IDWSSD was difficult to determine by the mission. The Government seems to have seriously committed itself to the social objectives set in the IDWSSD and hence included those units in the Fifth Four Year Plan. Nevertheless foreign resource component commitments are still open.

- (8) The role of consultants preparing TOR was not articulately defined in a conceptual framework in relation to the task of collection additional technical and market information pertinent to feasibility studies. Some had kept to the role of preparing TOR as the primary responsibility (e.g., Welded Steel Pipes), and some extended their role to as far as pre-feasibility studies with great emphasis on market and demand (e.g., Cement). The quality of TOR was also uneven amongst the consultants; some did not even take the basic format of a TOR except one (Welded Steel Pipes), which required re-writing by the UNIDO headquarters' staff. While this additional step could be anticipated in a large project like the one under evaluation, the additional turnarounds between the field and UNIDO headquarters have, together with the long chain of decision process amongst UNDP, the Government and UNIDO headquarters, contributed towards the delay in the implementation of the project.
- (9) The extension of professional service by consultants preparing TOR, into the phase of pre-feasibility in terms of technology and economic viability, however, has produced certain positive results. For example, it was during this preliminary phase that flexible decisions were taken on technology parameters, e.g., dropping of RHA cement, consideration of a Pilot Plastic Pipes and Fittings Demonstration Unit.
- (10) The design and content of TOR for feasibility studies would have been much more constructive if the nature of decision making by such parties as potential foreign donors and the Government had been properly taken into consideration. Three aspects would have been useful, if incorporated: (a) TOR require above all study of social cost-benefit analysis or national economic profitability; (b) TOR require study results be shown in a parametric form so as to assist the decision makers in taking appropriate options while knowing its decision (e.g., giving grants) impact in terms of social cost and benefits; and (c) clarification of the relationship between the project under IDWSSD and the other national industrial development policies. Although the present TOR have a requirement where consultant firms conduct a national economic profitability analysis, in the case of steel pipe it seemed somewhat less serious about it in implementing the clause. UNIDO has formally accepted the report on the Welded Steel Pipe project submitted by Eisenbau Essen GmbH. although the report has concentrated on the financial profitability analysis without attention to the national economic aspect.
- (11) With regard to the likelihood of implementing the study on the Welded Steel Pipe project into actual investment, it appears rather uncertain because of the negative perception by the Government officials (e.g., NPD, Officials from IPD and MIC), as indicated in paragraph 62.
- (12) The mission received an impression that the latest report and TOR on the Mini-Portland Cement Plant have caused some controversy in the minds of the Government officials. The cause of this controversy could be traced to the factors already analyzed in section III.D(a), i.e., too much emphasis on market and demand; lopsided perception as to the importance of financial feasibility; unclear role of the consultant in preparing TOR and other additional information collection on technology and economy.

- (13) The Training component of the project as been well-executed and the related objectives are in the course of being met. This is the most successful output from the project. The Government project officers trained in the two Seminars and the Fellowship Programme have been productively utilized by their effective participation in the conduct of feasibility studies.

B. Recommendations

62. The following are the major recommendations of the mission which, if accepted and implemented, may affect the remaining activities of the project. The mission does not anticipate that these recommendations would cause substantial changes in the course of the project in terms of budget and project life.

- (1) There should be a more explicitly agreement between the Government and UNIDO as to the purpose and meaning of "feasibility study" in the context of the IDWSSD and its relationship with the national industrial development programme. This agreement and understanding should be articulately transmitted to consulting firms, particularly through the means of TOR.
- (2) The TOR for the remaining feasibility studies are recommended to be more specific so as to include the following aspects and to ensure that the effect of the recommendations be incorporated in the final report of feasibility studies: (It should be reminded that the idea behind these modified TOR is to orient the result of the studies to be consistent with the information requirement on the part of decision makers, in this case, potential donor countries and the Government trying to implement the social goals of the IDWSSD.)
 - (a) the relationship of the project with the national industrial development programme, with particular emphasis that the project is for the achievement of social objectives;
 - (b) the social cost-benefit anaysis should be emphasized. (The present TOR already contains terms related to the national economic profitability, but this seems to have taken a secondary role in the course of implementation by the consulting firm, in the case of Steel Pipes Report.);
 - (c) the analysis should be shown in a parametric form, i.e., with a number of alternatives in scale so as to assist the decision makers in selecting the most appropriate combination of variables. It is particularly suggested that the study include analyses showing (i) a case financed exclusively from grants; (ii) a case financed with soft loans with varying interest rates; and (iii) a case financed with mixed capital structured of grants and soft loans;
 - (d) the analysis should also show if the project is implemented at the scale and locations suggested in the TOR and the analysis result indicates negative profitability, the magnitude of subsidy the Government has to bear, in order to fulfill the social objectives associated with IDWSSD;

- (e) in view of the fact that the Government considers the foreign exchange factor as the paramount constraint, the aspect of foreign exchange should be emphasized and clearly analyzed in terms of investment, subsequent imports of raw materials for production activities, and savings as compared to the continuous import of finished products for the purpose of achieving the social goal of the IDWSSD.
- (3) The application of the modified TOR suggested above may be extended to the Cement Plant and the Plastic Pellets Plant. (Even if it now appears procedurally too late to apply to the pellets project, it is recommended to seek ways of incorporating it in the sub-contract award.) The approach may also be utilized in the report on the Welded Steel Pipe project with some additional analyses in accordance with the spirit of the suggested TOR.
- (4) It is recommended that the Government consider the possibility of using loans to implement the projects, because donor countries might be more inclined towards loans or to mix grants with loans for projects which have a clear manufacturing character.
- (5) It is recommended that the Government also consider the possibility of adopting a scale and location different from the originally intended scope in the context of the IDWSSD, if the feasibility study results positively indicate such an alternative as desirable in the context of a sound national industrial policy.
- (6) Currently, a study is underway by consultants, Baldo and Co., on the feasibility of the Pilot Plastic Appliances Extrusion Demonstration Unit expected to be finished in January 1987 in draft form. It is recommended that the report contains engineering specifications detailed enough to be used as a basis for tender invitation for eventual implementation.
- (7) The analysis and submission to the Government feasibility study reports should be made in a unified form. This presupposes a joint analysis by the different substantive UNIDO Sections involved as well as the project management. Furthermore, the draft final report should be discussed with the project team, specifically the CTA and NPD, at the project site, before submission to UNIDO. This process is important as it can avoid a long decision chain later.

ANNEX I

Joint UNDP/UNIDO Evaluation Mission on DP/BUR/80/015 -
Feasibility Studies in Support of International Drinking Water Supply
and Sanitation Decade

I. BACKGROUND

1. The inception of the above project took place in late 1980 within the framework of Burma's preparations for the International Drinking Water Supply and Sanitation Decade (IDWSSD). In January 1982, a National Meeting on the strategy and detailed planning for IDWSSD was held in Rangoon. The Technical Committee presented to an international forum severe foreign exchange constraints to its programme.
2. In order to remove these constraints, the Government is now expediting certain feasibility studies with UNDP/UNIDO technical assistance within the framework of a large-scale project. It was signed on 10 May 1984 with a UNDP contribution of US\$1,300,000 and a revision increasing the UNDP inputs to US\$1,535,500 was approved on 25 February 1986.
3. The project which is being implemented by the Ministry of No. 1 Industry is concerned with production units for the supply of materials required for the IDWSSD programme. They include: plastic appliances extrusion plants, plastic pellets manufacturing plant, a welded steel pipe plant and mini-plants for cement. It has been agreed within the above project that a feasibility study for each of these sub-groups will be subcontracted by UNIDO to qualified consulting companies. A further output is trained personnel of the Industrial Planning Department and the respective Corporations under the Ministry of No. 1 Industry.
4. The project became operational by mid November 1984 with the arrival of the UNIDO Chief Technical Adviser, Mr. T.K. Murawski. The project is planned to be completed by July 1987.
5. The now planned evaluation was included in the project document in accordance with UNDP requirements to evaluate projects exceeding US\$1 million in UNDP contribution. It was also recommended by UNDP/UNIDO on the basis of the latest UNIDO Project Evaluation Report (PER).
6. Finally, the UNDP Office is of the opinion that considering the approaching termination of the project a thorough examination of all its components and an examination of the prospects for its impact is required.

II. SCOPE AND PURPOSE OF THE REVIEW

1. The primary purpose of the review of the project is:

- to evaluate it in order to determine how adequately its immediate objectives and outputs are being attained and how effective it has been or is likely to be in helping the Government to achieve the relevant sectoral and national development objectives;
- to identify the factors which may have facilitated or deterred the achievement of the project's immediate purposes and ultimate objectives; and
- to make recommendations for future action.

The Mission should feel free to review all steps in the formulation and implementation of the project and make recommendations as to its future.

2. In carrying out the review, the Mission will in particular:

- a) review the implementation of the recommendations of the First Tripartite Review (see Report of 20 November 1985);
- b) review the overall orientation of the project in relation to achievement of project objectives/outputs, and examine/assess the latest modifications in project's implementation approach concerning market, technical and other factors;
- c) examine the application and utilization of the training programmes (individual fellowships and training seminars);
- d) examine the application and utilization of feasibility studies produced and planned by the project;
- f) examine the relationship of the feasibility studies with the IDWSSD;
- g) examine the feasibility of the agro-based route for plastic pellets;
- h) examine the availability of gas and selection of site for the gas-fired mini-cement plant (this item may be subject to amendment in the light of the latest consultancy on mini-cement plants);
- i) examine the likelihood of investment based on the feasibility study is now in hand;

III. COMPOSITION OF THE MISSION

1. The Mission will be composed as follows:

- a) Consultant to be appointed by UNDP; and
- b) Staff member of the Evaluation Staff of UNIDO.

The Government of the Socialist Republic of the Union of Burma is invited to associate itself with the Mission's work.

IV. TIME TABLE AND ITINERARY OF THE EVALUATION

1. It is envisaged that the Mission would complete its duties during a time frame from 5 - 18 December 1986.
2. The itinerary of the Evaluation Mission is proposed as follows:
 - 2.1 briefing at UNIDO Hqs. Vienna on Friday, 5 December 1986;
 - 2.2 arrival in Rangoon on Monday, 8 December 1986;
 - 2.3 the Mission members will assemble at the UNDP Office on Tuesday, 9 December and will receive special briefing from the Resident Representative, Rangoon, as well as all information on the project developments from the Chief Technical Adviser and the National Project Director;
 - 2.4 the Mission will remain in Rangoon for 9 working days and will be de-briefed at UNDP, Rangoon.

V. CONSULTATION IN THE FIELD

1. The Mission will maintain close liaison with the UNDP Resident Representative in the Socialist Republic of the Union of Burma, the authorities concerned of the Government, the counterpart staff assigned to the project as well as the SIDFA.
2. Although the Mission should feel free to discuss with the authorities concerned anything relevant to its assignment, it is not authorized to make any commitments on behalf of UNDP or UNIDO.

VI. REPORTING

1. The report should be prepared in draft in the field in accordance with the UNIDO Guidelines for Evaluation Reports. The report should be presented to the Government in draft form so that there is an opportunity to discuss it. The report should be submitted in final form to UNDP and to UNIDO. The UNDP will be responsible for formal discussion of the report to the Government.
2. The leader of the Evaluation Mission is responsible for reflecting any comments on the draft report in the final version, and for seeing that sufficient copies are forwarded to UNDP for formal distribution and to UNIDO.

ANNEX II

List of persons met by the Mission

GOVERNMENT

Ministry of No. 1 Industry

1. U Aye Kyin, Director General, IPD
2. U Ban Yi, Director (Planning), Pharmaceutical Industries Corporation
3. U. Zau Myat Win, Head of Division (Project Planning Department), IPD
4. U. Myint Swe, Deputy Assistant Director (Planning) Metal Industrial Corporation
5. U Htun Myint, Planning Engineer, Ceramic Industries Corporation

Ministry of Planning and Finance

6. U Hla Thaug, Deputy Director, FERD

Ministry of Agriculture and Forests

7. U Myint Maung, Director-General, Agriculture Mechanization Department
8. U Ngwe San, Director, Planning Division, Agricultural Mechanization Department

PROJECT

National Personnel

9. U Chit Wai, National Project Director
10. Daw Swe Swe Ha, Project Manager (Plastic Pellets)
11. U Than Myint, Project Manager (Plastic Pipes)
12. U Myint Swe, Senior Industrial Investment Project Officer (Cement)

International Personnel

13. Mr. Tadeusz K. Murawski, Chief Technical Adviser
14. Mr. Ivan Teodorovic, Team Leader, Seminar on Project Preparation and Evaluation
15. Mr. Roberto Benvenuti, Team Leader, Baldo and Co.
16. Mr. Stefano de Bernardi, Plastics Processing Specialist, Baldo and Co.
17. Mr. Georg Kell, UNIDO Expert

OTHERS

18. H.E. Walther Baron von Marschall, Ambassador, Embassy of the Federal Republic of Germany in Rangoon
19. Mr. Zha Juanrong, Economic Counsellor, Embassy of the People's Republic of China in Rangoon
20. Mr. John Bright, Second Secretary, Embassy of Australia in Rangoon
21. Mr. Ba Hli, Ex-Director, Applied Research Institute
22. Mr. D. Eadie, Senior Expert, ILO

UNDP

23. Mr. K. Kitatani, Resident Representative, UNDP Rangoon
24. Mr. Kevin McGrath, Deputy Resident Representative
25. Mr. Cornelis Klein, Deputy Resident Representative
26. Mr. Jerzy G. Gorski, Senior Industrial Development Field Adviser

ANNEX III

List of attendants at the Wrap-up Meeting of 19 December 1986

1. U Soe Thwin, Director General, Foreign Economic Relations Department
2. U Khin Maung Win, Director, Foreign Economic Relations Department
3. U Myint Aung, Director, Foreign Economic Relations Department
4. U Nyunt Swe, Assistant Director, Foreign Economic Department
5. Daw Than Than Lin, Chief of Section, Foreign Economic Relations Department
6. U Than Swe, Deputy Director, Planning Department
7. U Ngwe Sann, Director, Agricultural Mechanization Department
8. U Tun Win Ba Tu, Deputy Director, Agricultural Mechanization Department
9. U Nyunt Hlaing, Director, Industrial Planning Department
10. U Tun Aung Kyaw, Director, Industrial Planning Department
11. U Chit Wai, National Project Director, Industrial Planning Department
12. Mr. Cornelis Klein, Deputy Resident Representative, UNDP Rangoon
13. Mr. Jerzy B. Gorski, Senior Industrial Development Field Adviser, UNIDO, Rangoon
14. Mr. Tadeusz K. Murawski, Chief Technical Adviser, DP/BUR/80/015
15. Mr. Seong-Jae Yu, UNDP Evaluator
16. Mr. Oscar Gonzalez-Hernandez, UNIDO Evaluator

ANNEX IV

List of Outputs (Work Plans, Reports, Fellowships and
Terms-of-Reference) by plant

<u>Outputs</u>	<u>Prepared by</u>	<u>Date</u>
(a) <u>Plastic Pipes and Appliances</u>		
1. Detailed work plan	U Than Myint	18 January 1985
2. Terms of reference for four plastic appliances extrusion plants	Mr. E.D. Chard	April 1985
3. Preliminary conclusions and recommendations on DP/BUR/80/015	Mr. J.A. Kopytowski	25 November 1985
4. Market Support Study - Part I: Technological aspects relative to production and market	Mr. R.W. King	April 1986
5. Market Support Study - Part II: The Market	Mr. R.H. Irvine	May 1986
6. Report and terms of reference on Plastics Testing Laboratory	Mr. J. Brzezinski	28 November 1986
7. Fellowship report in the field of plastic technology and polymer engineering	U Than Myint	18 July 1986
(b) <u>Welded Steel Pipe</u>		
1. Detailed work plan for welded steel pipe plant	U Nyunt Hlaing	18 January 1985
2. Terms of reference for welded steel	Mr. C. Griffiths	26 March 1985
3. Feasibility study report on welded steel pipe plant	Eisenbau Essen GmbH, West Germany	09 October 1986
4. Fellowship report in the field of iron and steel technology	U Nyunt Hlaing	31 July 1986
(c) <u>Cement</u>		
1. Detailed work plan (Mini-cement Project)	U Myint Swe	18 January 1985
2. Terms of reference (Rice Husk Ash Cement)	Mr. G. Gouda	18 March 1985
3. Terms of reference (Portland Cement)	Mr. A. Grisar	03 November 1985
4. Fellowship report in the field of cement production	U Myint Swe	14 May 1986

ANNEX IV cont'd

	<u>Outputs</u>	<u>Prepared by</u>	<u>Date</u>
(d)	<u>Plastic Pellets</u>		
1.	Detailed work plan	Daw Swe Swe Hla	January 1985
2.	Terms of reference for feasibility study on plastic pellets plant	Mr. E.D. Chard	April 1985
3.	Reports of assignment for elaboration of terms of reference for feasibility study on plastic pellets plant project	Mr. E.D. Chard	April 1985
4.	Support Study - Technological aspects of polymer production from agricultural origin raw materials for DP/BUR/80/015	Mr. J.A. Kopytowski	September 1985
5.	Preliminary conclusions and recommendations on DP/BUR/80/015 project	Mr. J.A. Kopytowski	December 1985
6.	Market Support Study - Report No.1 Technological aspects relative to the production and market	Mr. R.W. King	April 1986
7.	Fellowships report on the training in the field of thermoplastics polymer production in Brazil	Daw Swe Swe Hla	April 1986
8.	Market Support Study - Report No. 2: The Market	Mr. R.H. Irvine	May 1986