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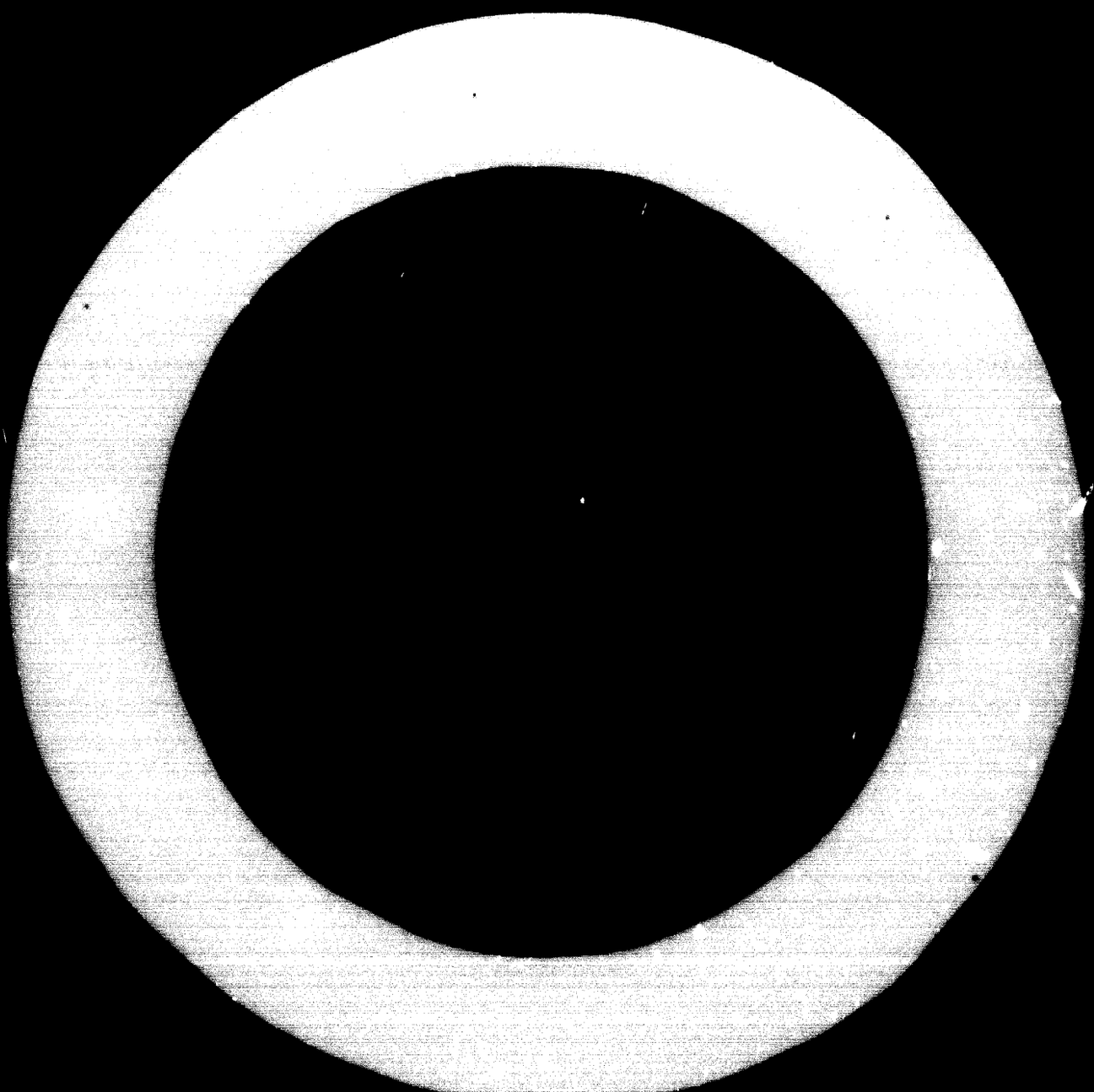
REPORT ON THE EVALUATION OF SELECTED ACTIVITIES OF UNIDO

ADDENDUM 3

EVALUATION REPORT: THAILAND

id./B-1677



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PREFATORY NOTE

1. This report has been prepared in accordance with the recommendations of the fifth session of the Industrial Development Board[1] and of the Special International Conference on UNIDO,[2] to the effect that UNIDO undertake jointly, with the Governments concerned, a regular evaluation of its activities in selected countries. The present report is based on a joint examination by the Government of Thailand and UNIDO of the technical co-operation activities carried out by UNIDO in Thailand from 1967 to 1971.

CHAPTER I: SUMMARY OF TECHNICAL CO-OPERATION BETWEEN UNIDO AND THE GOVERNMENT OF THAILAND

2. Although United Nations technical co-operation activities in the field of industry in Thailand date as far back as 1951, this report has been limited to those activities undertaken since January 1967, the year in which UNIDO was established and became one of the executing and participating agencies of UNDP. The technical co-operation activities in Thailand include the provision of expertise, fellowships, training and equipment; publications and information service; and participation in meetings, seminars and workshops.

3. The table below contains a summary of assistance rendered by UNIDO to Thailand since 1967.

4. The long-term UNIDO projects in Thailand since 1967 generally reflect the major industrial objectives of the Second Five-Year National Development Plan (for 1966-1970). To a large extent, even the short-term SIS projects requested and implemented during the course of the period under review can be said to have arisen out of the requirements imposed by the Plan. From this does not follow, however, that all the projects in Thailand were conceived and requested by the Government in the light of an over-all plan or pattern of technical assistance. While many of the projects could have been presented by the Government in an interrelated, if not integrated, manner, the organisational realities in the country may not have encouraged this.

5. The long-term projects (of one or more years' duration), with one or two exceptions, have had an institutional objective. Thus, the two UNDP/SF projects[3] are aimed at institution-building. Individual experts, under UNDP/TA or SIS, whose assignments were for a year or more were often called upon to lay the foundations of new institutions or to advise on strengthening those already existing.

1/ Official Records of the General Assembly, Twenty-fifth Session, Supplement No.16, document A/8416, para.271.

2/ Consensus resolution ID/SCU/Res.1, para.1(p), document A/8341/Rev.1.

3/ The Technological Research Institute and the Thailand Standards Institute.

ID/B/[illegible]/Add.1
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Table 2

Summary of [illegible] (1967 - [illegible])
(in thousands of US dollars)

	1967 m/m	1967 US$	1968 m/m	1968 US$	1969 m/m	1969 US$	[illegible] m/m	[illegible] US$	1971 a/ m/m	1971 a/ US$
UNDP/SF										
Expert	6/50	106.9	10/53	96.3	5/52	57.2	6/54	130.1	4/58	79.2
Fellowship		-		-		-		-	9/48	23.6
Other (Equipment)		43.8		30.2		-		-	misc.	7.0
UNDP/TA										
Expert	2/9	34.5	2/24	45.5	4/31	70.[illegible]		-	1/4	8.0
Fellowship	2/8	3.1	5/45	19.4		-	5/38	19.0	1/6	4.1
Other		-		-		-		-		-
Regular Programme										
Expert		-		-		-		-		-
Fellowship		-	1/3	1.7	4/27	29.9	4/30	18.9	5/28	17.7
Other		-		-		-		-		-
SIS										
Expert	1/3	5.5	1/9	13.[illegible]	4/5	10.5	9/40	106.6	8/36	66.0
Fellowship		-		-		-		-		-
Other		-		-		-		-	subcont.	27.0
Funds-in-Trust (Associate experts)										
Expert	1/42	37.8	4/48	50.0	3/25	31.5	2/18	27.9	2/16	32.0
Fellowship		-		-		-		-		-
Other		-		-		-		-		-
TOTALS										
Expert	13/104	184.7	17/154	204.8	16/113	169.2	17/112	264.6	15/114	185.2
Fellowship	2/8	3.1	6/48	21.1	4/27	29.9	9/68	37.9	15/82	45.4
Other		43.8		30.2		-		-		34.0

a/ Estimates only.

6. As to the fields of activities, a major portion of UNIDO's projects were concerned with the promotion of industry based on or related to agriculture. Thailand, known for its agricultural resources, has sought not only to increase its traditional exports but also to diversify and upgrade them to agro-industrial products by processing locally available or potentially available raw materials into semi-finished or finished products. As will be shown later, the major research programmes conducted in the Special Fund-assisted Technological Research Institute project and the various SIS projects show a preponderance of agro-related undertakings.

7. The government agencies with which UNIDO has co-operated in its technical assistance activities, in co-ordination with the Department of Technical and Economic Co-operation (DTEC), have been principally the Ministry of Industry and the Applied Scientific Research Corporation

of Thailand (ASRCT). Specific mention of the various departments and [illegible] Ministry of Industry and within ASRCT will be made in the review of [illegible]. UNIDO's assistance has also been requested by the Board of Investment and the National Economic Development Board. It may be pointed out, however, that Government [illegible] than those mentioned above have also made use of UNIDO experts by obtaining their opinions and advice. These agencies have also been helpful to the experts in providing [illegible] additional information and data on matters relating to their work.

3. The following review and evaluation of individual projects are presented on the basis of the government agency that requested the particular assistance concerned. This applies especially to the provision of expertise and equipment. Although reference will be made to fellowships awarded in connexion with the expertise provided, a separate chapter covers UNIDO's activities in the field of training.

CHAPTER II: EVALUATION OF TECHNICAL ASSISTANCE PROJECTS

ASSISTANCE TO THE MINISTRY OF INDUSTRY

Assistance to the sugar industry (SIS/67/62/Rev.1; SIS/68/468; SIS/[illegible])

9. The initial discussions on possible assistance to the sugar industry were held towards the end of 1965, at which time a proposal was made for a preliminary survey of the industry. Subsequent correspondence revealed, however, that in 1964 the Asian Productivity Organization had already provided an expert for a period of four months to carry out a general survey. Among the important findings of this expert was that the industry was experiencing, inter alia, engineering problems that had resulted in high production costs and poor quality sugar. The yield of crystallized sugar per acre of planted cane was very low. In 1963/1964 the Rockefeller Foundation had also provided an expert to conduct a survey of diseases affecting sugar-cane in Thailand.

10. The parameters of the industry having been established and its problems fully identified by these two missions, the Government through the Ministry of Industry decided that the next step would be the creation of an organization in the form of a sugar institute, which would give advice on and assistance in the long-term solution of the industry's recurrent problems. The institute would also be empowered to establish the necessary economic measures for stabilizing the production of cane and sugar and enabling the appropriate amount of sugar to be exported. The problems being complex, the Ministry felt that external assistance was necessary. In June 1966, the Government urgently requested the United Nations to provide a short-term expert whom they specifically nominated. Funding was immediately approved under the United Nations Regular Programme, but unfortunately the Government's nominee was not available before January 1967. Although the Government was willing to wait, an attempt was made to recruit another expert, also a nominee of the Government, before the end of 1966. Recruitment arrangements could not be completed and the funds lapsed. Eventually the expert was recruited under the SIS programme. He arrived in Thailand in March 1967 to undertake a three-months' [illegible] work.

11. The expert's main objective was to advise on the rationalization and modernization of Thailand's sugar industry. Specifically, he was requested to advise on the establishment of the proposed sugar institute and on the organization and promotion of the sugar industry. He was also required to prepare a further request to the United Nations for long-term technical assistance, if necessary.

12. The expected growth of sugar production from more than 100,000 metric tons in 1964 to around 400,000 tons within ten years made technical guidance imperative. In his final report, the expert considered the establishment of the sugar institute as a necessity and identified the problem areas to which the institute was to address itself during the coming years. The future of the industry would depend a great deal on the institute, backed by appropriate legislation, organization and work programmes. He therefore suggested the establishment of a sugar control board. Owing to the brevity of his assignment, the expert could not reply fully to the substantive queries regarding indications on the appropriate size for a factory to enable it to produce quality sugar and repay investment production costs, a definite viewpoint as to the profile of the future sugar industry, and specific recommendations on standards of processing techniques, equipment etc. in the future reconstructed sugar factory. Since sugar-cane is a poor crop for an individual farmer, UNIDO also suggested that consideration might be given to adopting highly mechanized methods for cane growing, harvesting, and transporting from large agro-industrial complexes, managed by the factory itself, in which the farmer would really be an industrial worker. While the expert accepted this suggestion in principle, he felt that the transformation of the existing pattern into an agro-industrial complex might prove too much to bear for the growers, who owned the land, and added that it was not absolutely essential to make the transformation at that stage. However, in the future development of new sugar producing areas in Thailand, he accepted that it might be advantageous to inject the agro-industrial complex design into the programme.

13. Four months after the expert had left Thailand, UNIDO was advised by the UNDP Office in Bangkok that the Ministry of Industry had carefully studied the expert's report and had approved it. Many of the recommendations were incorporated into the Sugar Act, including in particular the establishment within the Ministry of Industry of the Sugar Institute, to provide technical and financial assistance to cane farmers and sugar millers, and the Sugar Advisory Board to stabilize the production and price of cane and sugar. A sugar experimental station and a sugar-cane breeding plant were also established, as recommended.

14. In December 1968, the Government requested further assistance in consolidating the efforts of the Ministry of Industry. This request was approved by UNDP in February 1969. The accepted candidate could not report for duty until 31 January 1970. He was assigned for seven and a half months under SIS. During his mission, he laid emphasis on the fact that the sugar industry was a typical industry in which the quality of raw materials, organized supply to the plants, industrial processing and refining as well as the utilization of by-products were so interrelated that only combined efforts to improve the whole sector could give positive economic results. His final report was comprehensive and cogent, covering all aspects of the industry. The Government's special attention was drawn to the following aspects:

(a) While the number of cane growers was decreasing, the cane area was increasing and there was already a shortage of labour. [illegible] and the fact that non-mechanical harvesting costs were approaching the costs of mechanical harvesting were adequate pointers for the kind of action to be taken in the near future.

(b) The sugar factories should take the initiative to make regular maturity tests, to advise on the best harvesting time, to supervise the delivery scheduled for growers etc.

(c) Although the equipment in most factories was modern and in good condition, there was room for further improvement, such as the proper treatment of bagasse used for boiler heating, shortening juice evaporation time etc.

(d) A refined sugar plant should be established.

(e) A research programme on bagasse utilization should be initiated.

15. The advice and assistance of the two UNIDO experts have undoubtedly contributed to the dynamic changes in the sugar industry. The active co-operation given to them by the Government in the form of high-level counterparts has, of course, added to the impact of the project. The Sugar Institute and the Sugar Advisory Board have been established and are believed to be functioning properly.

16. Many aspects of the industry are still in need of further critical studies, but some of them lie outside UNIDO's terms of reference. In the meantime, the Government requested in November 1970 a six-month fellowship under TA in sugar processing techniques, which was recommended by the UNIDO experts. This is now being implemented. Also to be implemented soon is a recommendation for expert assistance in plant modification of the Bupnbari Sugar Mill to enable it to manufacture refined sugar directly from sugar-cane. This two-month assignment was requested in February 1971 and approved in April 1971. The Government had accepted a candidate who was expected to report before the end of 1971 but unfortunately could not do so. New candidates have been submitted for consideration by the Government.

Industrial estates pre-investment survey (SIS/66/35)

17. Under this project a feasibility study was undertaken for the establishment of an industrial estate for small- and medium-scale industries in the Bangkok-Thonburi area. The study included economic analyses and projection of industrial growth in the area, the need for relocation of existing enterprises and the provision of accommodation for new enterprises; an economic, physical and engineering evaluation of some four alternative sites for the location of the industrial estate; selection of sites and preparation of a master plan including physical layout; estimate of costs and recommendations on phased development; and advice on management and financing of the estate, including zoning legislation.

18. Although the request was made in October 1966, the project could be implemented only during 1968/1969, primarily because of the time taken in selecting a suitable candidate. The original request was for a team of two experts (an industrial economist and a physical planner/engineer). The Government did not accept any of the candidates submitted for the post of industrial economist and arrangements had to be made at a late stage for the part-time services of an economist on loan from the Asian Institute for Economic Development and Planning, Bangkok.

It does not appear, however, that the delay of one and a half years in implementation of the project request had a significant bearing on the outcome of the project, since the principal bottle-necks in establishing industrial estates in Thailand were at that time, and still are, the high cost of land, the lack of domestic financial resources (allocated by the Government or made available through financial institutions for the establishment of industrial estates) and the lack of an organization to establish and operate industrial estates.

19. Counterpart support for the project was not entirely satisfactory. The expert was a qualified physical planner and civil engineer and the technical details of the work were satisfactory. However, as the economist was available only part time, the engineer expert himself had to carry out economic studies also. The main outcome of the expert's work was the identification and description of a number of alternative sites for industrial estates, with no established priorities for their implementation. In fact, the expert thought that all projects, without exception, should be implemented at a total cost of $30.7 million. In the absence of an indication of the available financial resources to establish the industrial estate, the plans originally presented by the expert appeared to be grandiose and unrealistic and beyond the capacity of the Government to follow up and implement. During his debriefing in Vienna, the expert, in co-operation with the UNIDO secretariat, revised his conclusions. He suggested the alternatives of a maximum development programme including three industrial estates and nine industrial areas and a minimum programme including one industrial estate and three industrial areas. Specific sites were proposed for priority development under each alternative.

20. Soon after this assignment was completed, the agency responsible in the Government for the establishment of industrial estates was changed from the Department of Industrial Promotion to the Department of Industrial Works. In 1970, the latter Department commissioned another study from the Overseas Technical Co-operation Agency in Japan.

21. On the basis of both these reports, the Government started establishing the first industrial estate in Bang Chan. Further development of industrial estates has been held up due to lack of funds.

22. In September 1970, an International Bank for Reconstruction and Development (IBRD) mission assisted in preparing the industrial estates development programme for the third five-year plan. This programme has been approved by the National Economic Development Board. It has been recommended that the programme should be implemented by an autonomous government agency functioning as a corporation. The present group in the Department of Industrial Works would be absorbed into the autonomous corporation. It is envisaged that a total investment of $14 million would be required for industrial estates; out of this, long-term loans to the extent of $6 to 7 million are proposed to be negotiated from the international institutions. UNDP/UNIDO assistance is being envisaged: (a) to assist in the organization of the corporation; (b) to train counterparts; and (c) to assist in the preparation of feasibility studies suitable as documents for loan appraisal.

23. To sum up, it can be stated that even though the initial UNIDO technical assistance in 1968/1969 did not immediately result in follow-up action, it has over a period of three years contributed to more rational and realistic thinking and more systematic planning with a view to the establishment of industrial estates in Thailand.

Adviser on marketing organization for small-scale industry and handicraft products (SIS/0/301)

24. Under this project the expert studied the problem of marketing - both national and international - of products of small-scale industries and handicrafts in Thailand and prepared comprehensive recommendations for the establishment within the Department of Industrial Promotion of a marketing organization, which would undertake market surveys and research, dissemination of information, improvement of product design, quality control and standardization and market promotion. The request was received in May 1968 and the expert was at his post in February 1970. The delay was due largely to endeavours to recruit a specific candidate who ultimately was not available and to problems of finding an alternative candidate acceptable to the Government.

25. Adequate counterpart support was provided for the expert. His final report was thorough and comprehensive. However, after discussion with the government officials concerned, the expert took a much broader view of his task than was envisaged in his original terms of reference. Instead of confining his report to small-scale industries and handicrafts, he conceived a marketing organization for the entire industrial sector in Thailand. The organization recommended consisted of three components: a Handicrafts Promotion Organization, an Industrial Trade Centre and an Industrial Product Design Centre.

26. The major recommendation related to the eventual establishment of an industrial trade centre as an autonomous organization consisting of a product information division, a promotion division and a marketing research and development division. Assistance in establishing the Industrial Trade Centre was proposed in the form of a UNDP/SF project for a duration of five years and costing UNDP more than $525,000. The establishment of the Industrial Trade Centre involved a considerable counterpart financial commitment from the Government. Co-operation between the Government and the Association of Thai Manufacturers was contemplated. From the side of the United Nations system, the establishment of this project would involve not only UNIDO, but also the UNCTAD/GATT International Trade Centre. The proposal is still under study by the Government.

27. The expert's recommendations for assistance to the Handicraft Promotion Organization, through expert services in industrial design and exports of small-scale industry and factory craft products, were accepted by the Government and a request was sent to UNIDO in March 1971. The project consists of one expert in each of the above-mentioned fields for a duration of 12 man/months each. The experts are under recruitment.

28. In general, it may be stated that the work of the expert on the marketing of small-scale industry and handicraft products has had immediate impact and resulted in further specific assistance in the field of design and exports. It is as yet early to judge the total result of the recommendations of the expert on setting up a comprehensive marketing organization. The expert's recommendations and proposals have certainly stimulated the Government towards streamlining the existing organizational arrangements and seeking the co-operation of the Association of Thai Manufacturers.

[illegible] industrial products. Prior to the passage of this Act the Government prepared several integrated national plans designed to accomplish the purposes of the Act, one of which was the plan for the above-mentioned Institute. On the basis of this plan, a request was made for UNDP/SF assistance in establishing such an Institute. UNDP approved this project in January 1970 and the expert helped during the initial stages.

30. During the expert's tenure, eighteen fellows were given training abroad in standardisation and quality control. They now constitute the nucleus of the staff operating the Institute. The expert also assisted in forming a Standards Council to govern TISI.

Industrial classification expert (SIS/68/38; THA/68/6)

31. Funds were requested by the Government in August 1967 to allow an ILO industrial classification expert to continue his work under UNIDO. While UNIDO supported the request in principle, certain inter-agency jurisdictional claims in the area of statistics had to be settled before the project was approved by UNDP more than a year later. Another expert was assigned in September 1969, to assist the Ministry of Industry, the Department of Labour and the National Statistical Office in the preparation of a detailed Standard National Industrial Classification System, which was a necessary counterpart to the Standard National Classification of Occupations prepared with ILO assistance.

32. The expert elaborated a five-digit industrial classification system, which was approved by the Government. Furthermore, he advised the Government on the steps to be taken to improve industrial statistics and on the prerequisites for utilizing the data available in the Ministry of Industry for planning purposes. His analysis and recommendations in this respect were particularly useful for the Industrial Advisory Mission to the Industrial Economics and Planning Division in September 1970 (see SIS project 70/868, paras. 65-67 below). By visits to establishments, the expert was able to test the applicability of the five-digit industrial classification. He also advised the various agencies dealing with industrial statistics on the possibilities for improving their information systems.

Rice processing industry survey (SIS/68/386)

33. In January 1968, the Government addressed to both FAO and UNIDO an inquiry concerning possible assistance for a survey mission in connexion with the rice processing industry. Problems of financing and inter-agency jurisdiction delayed further action on this request. It was officially submitted to UNIDO in August 1968 and approved by UNIDO in the same month. UNDP referred the proposal to FAO, which suggested that a mechanical engineer be assigned by UNIDO and a rice processing expert by FAO. After further discussion it was agreed that the industrial

[illegible] covered by the two UNIDO experts, [illegible] that FAO would provide [illegible] country in Bangkok or [illegible] UNIDO in February 1969.

[illegible] of the Government's wish to have the team in the field as early as possible, UNIDO decided in April 1969 to utilize the services of a consulting firm to undertake the [illegible]. UNIDO felt that the project was of fundamental importance in defining the course of [illegible] for the rice processing industry in general and must therefore be undertaken by persons with a complete and thorough knowledge of the most modern systems. Since these systems were only recently developed, it would be difficult to obtain people with this expertise through normal recruitment channels. The Government agreed to this approach but did not approve until 25 November 1969 the list of consulting firms submitted to them on 9 May 1969. The Government had requested some background information before clearing the firms and also wanted an additional clause included in the terms of reference to provide for recommendations for appropriate measures to improve the efficiency of existing rice mills. Contractual arrangements were completed in March 1970 and the selected firm sent its team to Bangkok in August. The gap of five months was due to the consultants' reluctance to report in the field before November because according to them the mills would be idle before then. The Government insisted, however, on an earlier reporting date. The consultants submitted their draft final report entitled "Survey study for the establishment of a modern rice processing mill in Thailand and comparative study between existing and modern rice mills" in March 1971. The report was not considered satisfactory by UNIDO and a subsequent redraft on which UNIDO still had reservations was submitted to the Government in January 1972.

35. The long delay in getting this project off the ground may have reduced its value and its impact on the rice processing industry of the country. The survey character of the original request was modified in favour of a more stringent technical and economic feasibility study for the establishment of a modern rice processing mill in Thailand. Moreover, the consultant did not produce a report in accordance with the contract and a completely new report had to be made, thus contributing to the delay.

36. It must be admitted, however, that although the contractor's performance was disappointing, his task was a difficult one because of the social, economic, and political problems connected with the rice processing industry in Thailand, the fact that the international market has changed from a seller's market to a buyer's market, and the present situation of oversupply and low prices in the rice trade.

Feasibility study for industries based on kenaf (SIS/68/416)

37. Requested simultaneously with the survey mission of the rice processing industry, this study underwent during the initial stages similar problems of financing and jurisdictional responsibility. The growing of kenaf or "Thai jute" was developing rapidly and in 1966 it had become Thailand's third largest export earner. In order to stabilize and further develop the industry, and especially to encourage the increased conversion of the fibre within Thailand,

(c) To forecast export possibilities for kenaf-based products, including gunny sacks, during the next twenty years;

(d) To consider possible alternative uses for kenaf fibre.

38. Both UNIDO and FAO were requested in January 1968 by the UNDP Regional Representative to look into the possibility of carrying out the project. It was decided in July 1968 that SIS funds be utilized for the UNIDO component of the joint venture. UNIDO proposed sending a three-man team composed of a textile technologist (UNIDO), a marketing expert (UNIDO) and a commodities expert (to be filled and financed by FAO). It was further suggested that an agriculturist already stationed in Bangkok be deputed by FAO to work with the team. FAO did not have the funds and, therefore, UNIDO executed the project alone, with FAO involvement limited to an invitation to comment on the draft report of the mission. UNIDO requested UNDP approval on 22 October 1968. UNDP's insistence on active FAO involvement in the project led to further negotiations. The project was finally approved on 5 February 1969. The job descriptions were circulated on 25 March. Difficulties were experienced in forming the team because of the availability of the individual experts on different dates. The textile technologist was posted two months earlier than the marketing specialist (team leader) and the commodities expert, both of whom arrived in Bangkok in January 1970. The team stayed in Thailand until the end of March. The draft final report was reviewed by UNIDO in July and a final version printed and submitted to the Government in early September 1970. Among the major recommendations of the mission were as follows:

(a) Setting up of a Kenaf Commission;

(b) Guaranteed minimum price;

(c) Ascertaining of the reasons for differences in fibre fineness occurring in different areas of Thailand;

(d) Setting up of certain controls over activities of baling plants to improve over-all standards of grading;

(e) Securing expert assistance in the preparation and grading of fibre;

(f) Establishing regulated markets for kenaf;

(g) Obtaining expert services to survey the efficiency of certain mills with a view to possible reorganization.

39. Additional recommendations were given for the improvement of cultivation methods, irrigation, ribboning, credit facilities for farmers, new uses for kenaf, and future prospects for kenaf fibre. On the two latter points, the mission was generally not very optimistic about new uses in view of the heavy encroachment of synthetic fibres on the traditional markets. There

...re possibilities, although difficult to assess at the time of ..., of ... of pulp for paper by using kenaf fibre and the woody stems. The ... ported to follow the general pattern of demand for jute where the ... varied between a minimum of 5 per cent and a maximum of 11 per cent. However, ... of recent years and the high prices prevailing for jute and kenaf ... threat to jute by synthetics such as polypropylene. Kenaf was also in competition with jute, especially in the manufacture of sacks, although the demand for kenaf for the manufacture of lighter fabrics might increase.

40. As a direct follow-up to this mission, an expert will be assigned shortly to the Technological Research Institute to assist in the preparatory engineering design and and plant layout work for the bleached chemical pulp mill using kenaf and other indigenous raw materials. He will also assist in making a techno-economic assessment of the plant so designed.

Ceramic technology expert (THA/68/63)

41. This three-month mission, approved and implemented in 1969, was requested by the Department of Science, Ministry of Industry, to advise on organizing its Ceramic Research and Training Centre. During the brief assignment the expert investigated raw materials in Thailand and recommended measures for improvements in ceramic bodies and glazes. Methods of practical research work were shown. Kiln corrections were made and proper construction methods demonstrated, especially for rural ceramic industries. The knowledge and techniques available in the Centre called for upgrading and the expert therefore recommended measures for more intensive training.

42. The Government requested the expert's services under another aid programme for a longer period to continue the work he had begun. Further UNIDO assistance, however, is still required and the Government has requested the services of two experts, one in ceramic white ware products and the other in kilns and refractories, to assist the Department of Science for one year in research and development work on ceramics.

Maintenance and repair (SIS/70/783)

43. In order to obtain a clearer background to a request submitted by the Government on 18 November 1969 for two experts to advise on the improvement of maintenance and repair facilities, UNIDO suggested sending an exploratory mission of one month's duration. A consulting-firm was hired for this purpose in August 1970. The efforts of the consultant were directed to maintenance and repair problems in government-owned concerns. Despite the short duration of the mission, the consultant produced a comprehensive report covering as it did a good cross-section of government industries.

44. The survey revealed that the existing maintenance and repair facilities, while generally adequate, were in need of more effective management. Major maintenance problems had also resulted from wrong purchases due to lack of expertise during the initial stages of plant design and equipment specification. Moreover, few supplier companies had effective local representation to assist not only in purchasing but also in meeting maintenance needs. There was a need for encouraging private maintenance contracting firms and for increased emphasis on standardizing plant and machinery to cut maintenance costs and minimize maintenance problems. The opportunity

[illegible] Among

(a) A plant capacity, plant modification study of certain Government plants so as to provide the basis for sound maintenance policies;

(b) Specification of the most effective systems of maintenance reporting and control within individual plants after the development of maintenance/plant modification policy;

(c) The organization and conducting of an annual maintenance forum, making this a regular show-case for advance maintenance management;

(d) Preparation of a revised practical maintenance course for maintenance management and maintenance engineers.

The short-term programme would be conducted only after an analysis had been made of the viability of individual plants. As to the long-term recommendations, these concern, inter alia:

(a) The development of standards and more effective government regulations in respect of plant and equipment selection;

(b) Building up of maintenance specialists as future contractors;

(c) Improved statistics to enable business enterprises to assess the scope for local manufacture of spare parts;

(d) Maintenance training on a systematized basis;

(e) Research and development work on corrosion.

46. These recommendations, particularly in regard to the demonstration of preventive maintenance methods in one of several government plants, are being put into effect by the Government.

Leather industry promotion (SIS/70/719)

47. Originally intended as a short exploratory mission to look into the local leather and footwear industry and to appraise possibilities of improvement, the project requirements as submitted by the Government in November 1969 necessitated at least a two-month mission. UNIDO supported the request, to which UNDP agreed on 15 January 1970. Candidates were submitted to the Government in April 1970 and a selection was made in June. The expert assumed his duties in August and was assigned to the Department of Industrial Promotion, Ministry of Industry.

48. To appraise the whole situation of the leather industry and to propose a programme for its development, the expert had to investigate the following areas:

(a) The supply of raw materials for the industry;

(b) Methods of processing hides and skins into finished leather;

(c) Utilization of available local materials in the manufacturing processes to replace imported materials (i.e. tanning agents);

(d) Standards for tanned leather and for [illegible] ;

(e) Establishment of a training [illegible] ;

(f) Import substitution;

(g) Locally added value by further [illegible] (i.e. chrome-tanned kid and skins in the "wet blue" or crust state).

49. The expert completed his assignment in September 1970 and submitted a report that contained valuable information on leather and allied industries in Thailand, and presented constructive recommendations for the improvement of the industry. The hides and skins industry was in need of quality improvement in respect of flaying and preservation methods etc., resulting in considerable losses due to poor processing. As to the quality of leather produced in local tanneries, it varied from poor-mediocre in small plants to fair-good in medium-sized plants. On the whole, there was considerable need for improvement, especially regarding buffing and finishing of upper leathers. The footwear industry was still not up to normal standards and a considerable quantity of footwear was imported. The bulk of real leather goods articles was also imported, and there appeared to be no traditional background in local manufacture of these goods. The local manufacture was done in very small units, with the quality of articles generally low.

50. Among the expert's recommendations was the establishment of a small leather laboratory in Bangkok to serve the leather and leather products industries. This laboratory, with appropriate support from the Government and backing by the industry, could well become the future leather institute. The Government has considered the expert's report and is expected to include in its country programme long-term assistance to the industry in the form of expertise and fellowships.

Product design index and certification system (TH/70/958)

51. The main objective of this project, submitted on 29 May 1970, was to plan a product design index and a certification system for the country, patterned after the United Kingdom Design Centre, as part of the Industrial Product Design Centre. On 30 June 1970, UNDP approved its financing in principle. The Government requested the services of a specific expert who reported for this four-month assignment in February 1971.

52. The expert's initial finding was that there were not enough Thai-made consumer durable goods in current production on a quantity basis and with a high enough design content to enable an index to be fully established and a design centre to function. Nor was it easy to predict when conditions would be favourable enough for a permanent yet constantly changing design exhibition centre to open. But the expert recommended that even now a design index should be started and occasional small exhibitions held, as part of a general scheme for design education. The Industrial Product Design Centre, established in 1963, would have to be reorganized into an executive instrument of the future Thai National Design Council. The expert prepared a detailed programme of reorganization, for which UNIDO might be required to provide some assistance. In addition, he suggested such measures as appointment of a design index committee, selection of technical assessors who would clear the product for acceptance in the design index, a design selection service, registration of designs and a designers' society.

[illegible] felt [illegible] established [illegible] and study [illegible]

[illegible]

An exploratory mission was requested by the Government in November 1969 to assist in ascertaining the current and future needs of Thailand's manufacturing industry for promotional and protective packaging design services for consumer products, and in examining the packaging industry with a view to recommending measures for improvement and expansion. A consultant and a UNIDO staff member visited the country for a period of two weeks in December 1969. While the mission noted that packaging was still in its infancy, both in quality and quantity, especially in the case of firms with no foreign background, the fast changing patterns of production, transportation and distribution plus the particular attention being paid by the Government to the development of industry with export potential, called for immediate steps to prevent a serious gap between supply and demand of packaging materials, packages, packaging machines and know-how. The mission recommended a detailed study on Thailand's future needs in this field and the establishment of an information centre for packaging matters. In addition, it felt there should be a central place where instrumental and personnel facilities would be available for the day-to-day problems of the packaging using and producing industries. It also recommended that the greatest possible support be given to the Packaging Association for Thailand.

As a follow-up of the mission's recommendations, the Government requested on 2? May 1970 the services for two months of an expert to give advice on the establishment of a packaging design centre. If found feasible, he would be expected to assist the Department of Industrial Promotion in formulating its structure and functions. After certain clarifications were received from the Government on the scope and intent of the mission, UNIDO submitted the request to UNDP on 24 August. UNDP's approval was given on 16 September. Candidates were submitted to the Government in January 1971 and the decision was received in March. The selected candidate reported to the field in August.

After a thorough examination of the packaging industry in Thailand, the expert concluded that there was a strong basis for a packaging centre that would include in its functions packaging information, training, promotional and technical advice, and testing service. Regarding the question of where to locate the future centre, the expert suggested that it would be best for it to develop out of the Packaging Division of the Small Industries Services Institute, becoming a separate but parallel organization with the Department of Industrial Development. It is hoped in this manner that the new body will be able to work exclusively for packaging and thereby have the chance to gain the confidence of the industry. The final report will be submitted to the Government subject to the receipt of minor amendments from the expert.

Industrial effluents and trade wastes (SIS/70/859)

57. On 6 January 1970, the UNDP [illegible] Ministry of Industry for SIS/70/859 [illegible]:

(a) Examining the problem of industrial effluents and trade waste disposal in the Bangkok and Thonburi area, and identifying sources of water pollution;

(b) Establishing standards for industrial effluents and trade waste discharges;

(c) Drafting the industrial effluents code and control regulations;

(d) Determining the necessary means for enforcing the regulations.

58. The duration of the assignment was considered inadequate, and a six-month project was suggested by UNIDO and approved by UNDP in April 1970. Further examination of the project requirements led to the decision to have it undertaken by a consulting firm. The consultants arrived in Bangkok in November 1970.

59. The team worked principally with the Ministry of Industry and the Ministry of Public Health. They examined the existing data and enhanced them with information collected during their visits to factories and laboratories and similar on-the-spot investigations. Discussions were also held with the Ministry of Industry and other representatives, and chemical analyses of waste water samples were carried out by the team. The findings of the study have materialized in the drafting of standards for industrial effluents discharge relating to the most problematical branches of industry, and in recommendations on analysis practice. Regulations on industrial effluent discharge and its control have been designed on the basis of the survey and in conjunction with the team's own experience. However, further progress will need: (a) a very clear understanding of the distinctive features that need to be installed and enforced to achieve effective control of the major source of pollution; (b) training of industrial waste and pollution inspectors in the appropriate government department; and (c) further training of laboratory personnel in analytical techniques and sampling procedures needed for checking and controlling pollution.

60. The final report was submitted to the Government on 18 May 1971, and follow-up of the mission's recommendations for further assistance is expected.

Soybean project (SIS/70/860)

61. Although the request was originally addressed to UNIDO in April 1970, the project was assigned to FAO with UNIDO's participation limited to deputing a process engineer to the five-man team composed of a technologist, production economist, agronomist, marketing consultant and process engineer. The mission arrived in the field in May 1971 and left Bangkok in June 1971.

62. Although the mission concluded that there was insufficient raw material base for a soybean processing industry, the UNIDO expert expressed the view that the insufficiency might be partly due to the emphasis being given to the production of soybeans primarily as a raw material for vegetable oil. Soybeans are presently considered in Thailand as "oil-seed" and therefore

have to compete with other oil-seeds (ground-nuts, kapok etc.) in the country's oil industry. It seems that soya oil is not very much favoured by the population, whose preference is for ground-nut oil, palm-oil, kapok etc. The backward linkage to the raw material is, therefore, weak because of the lack of demand and the consequent influence on the quantitative and qualitative production. On the other hand, the protein cake or extracted meal is treated as a by-product of the vegetable oil industry and, according to the expert, its special value as a protein feed or food component is insufficiently recognized by the processing industry in Thailand. He has therefore recommended that the approach be changed and that local authorities, research institutes and other competent institutions take it upon themselves to convince the processing industry and the consumers of the protein value of soybeans. It is the protein meal (feed and food) which must become the main product produced by the soybean processing industry, with the soybean oil only of secondary importance. The protein value of soybeans, however, cannot be proved by education only; it will be necessary to produce high value soy products and introduce them to the population in order to promote marketing. The processing industry will act immediately if a profitable market becomes visible; and the processing industry will, without doubt, also stimulate agricultural production.

63. With the progress going on at Kasetsart University in the introduction of new non-conventional soy protein food and the growing demand for soya milk ("Vitamilk" produced by "Green Spot" manufacturers), UNIDO sees encouraging signs in the domestic market for new quality products based on soybean if greater efforts are expended.

64. At the time of writing, the report has not yet been submitted by FAO to the Government, and it is therefore premature to make an assessment.

Industrial advisory mission (SIS/70/868)

65. Approved in July 1970, the project was intended to advise and train the staff of the Industrial Economics and Planning Division (IEPD) of the Ministry of Industry in the latest techniques and procedures for industrial planning and project programming. The scope of the mission was subsequently modified. The training component was dropped because of the urgency of assisting in the preparation of the industrial component of the 1971-1976 National Development Plan. The team reported for duty in September 1970.

66. The mission accomplished the following:

(a) It evaluated and commented on the preceding planning activities and target figures;

(b) It formulated its views on the industrial strategy and policies to be applied by the Ministry;

(c) It formulated guidelines for the future planning work;

(d) It explained to various agencies involved the implications of establishing a data bank for industrial planning purposes as part of a proposed centre for industrial studies and data service;

(e) It prepared an outline of technical assistance for

(i) carrying out the future planning work;

(ii) improving the data base for planning and policy purposes.

... The objectives of the recommendations was discussed ... with professionals of the relevant departments and agencies. ... industrial strategy and policy were accepted by the counterpart Ministry.

... Proposals for follow-up technical assistance in the preparation of ... guidelines of the mission were followed up by the Government immediately; the post THA-121-A was opened and an expert recruited. The proposal for assistance in improving the data base of the Ministry of Industry met with some delay; the data bank approach as proposed by the mission and discussed with several agencies required formal endorsement by those agencies, and this apparently caused the delay. However, the establishment of the proposed centre is included in the new Development Plan and the assistance required is being considered for inclusion in the UNDP Country Programme. An expert under SIS is now under recruitment who will assist in finalizing the proposal, taking into account the latest developments in the Ministry of Industry, the Board of Investment and other major development agencies in the country concerned with the information system for industrial planning.

69. The experts involved in the mission were well qualified to carry out the task expected of them. The composition (three outside experts, two UNIDO staff members) guaranteed an adequate follow-up by UNIDO. They adapted very well to the sudden and urgent change in the nature and objectives of the mission. Much is due, of course, to the supporting services given by the Government. Since it was a short-term mission, the team did not work permanently with counterparts. However, the Director of the Industrial Economics and Planning Division and his staff actively co-operated in the project, which helped to ensure its success.

Adviser on industrial development programming, THA-121-A (SIS/70/1122)

70. Requested and approved in November 1970, a highly qualified expert was appointed by UNIDO in May 1971. The expert had particular competence in quantitative economic analysis. Owing to the scarcity of data for planning exercises, however, this special qualification does not seem to have been fully utilized.

71. The expert received full co-operation at the Industrial Economics and Planning Division where his principal job was to advise on and assist in the preparation of the industrial component of the 1971-1976 National Development Plan. Several counterparts were assigned to work with the expert. He attempted to complete an analysis of several groups of industries, which is to be published as part of the Plan. However, the time was limited, and a return visit has therefore been requested to finalize the analysis. The analysis will contain specific recommendations for policy measures to remove obstacles to the progress of industrial development in the sectors analysed. In order to give industry a closer examination, the expert proposed an in-depth survey of the industrial sector to be undertaken on a recurrent basis covering the plan period considered. The formal decision of the Government was awaited, but this recommendation confirmed the urgent need for implementing the proposed centre for industrial studies and data service.

Textile industry adviser (SIS/71/1252; SIS/71/1440)

72. This assignment is a continuation of a project in the textile field initially undertaken by ILO through a UNDP/SF project for small-scale industries. In requesting this assignment, the

[illegible] Annex.

[illegible] and consultant [illegible] undertaken by [illegible] fibres such as [illegible] textile institute. A [illegible] to the idea and recommended [illegible] Meanwhile, the Government [illegible] UNDP and approved [illegible] expert and the provision of two fellowships.

73. The textile industry adviser, in addition to his job of advising and assisting in the planning, organization and development of the textile institute, continues to render assistance to the industry by consultancy work, training and extension programmes.

Financial adviser (small-scale industries) (TA/TH/52)

74. The request for an expert in the financing of small-scale industry was included by the Government of Thailand in the UNDP/TA programme for 1971. The expert has been recruited and arrived at the duty station in the third week of September 1971.

75. The project, which is for a duration of one year, involves assistance to the Small Industry Finance Office of the Department of Industrial Promotion in improving policies, procedures and measures for the financing of small-scale industries. Since the expert has just commenced work in Thailand, it is too early to evaluate the project.

Special Fund assistance in the establishment of the Thai Industrial Standards Institute (TISI) (THA-37)

76. The project, which aims to consolidate and enlarge the preliminary work started by the UNIDO adviser on industrial standards, was presented to the UNDP Governing Council in January 1970 for approval. Specifically, the purpose of the project is to assist in establishing the Thai Industrial Standards Institute (TISI) as the official, effective and central government body for the preparation and publishing of standards and for the certification of standardized products in order to facilitate further improvement in the quality of commodities, both locally produced and imported, and to cope with the ever-increasing requirements of industrialization. The Plan of Operation was signed on 14 October 1971 and the project declared operational by UNDP on 19 October 1971.

77. The project was assisted during the first six months by the UNIDO industrial standards adviser while recruitment was going on for the post of project manager. The latter was appointed in January 1971, and so far he is the only expert appointed to the project. The two other experts could not be sent earlier as their appointments have to coincide, more or less, with the return of their counterparts from fellowships abroad. The project is encountering considerable difficulties in moving towards the achievement of its objectives, for a variety of reasons.

78. Serious difficulties are being experienced, for example, in recruiting qualified staff for the Thai Industrial Standards Institute. Efforts on the part of the Government are required to solve this problem if TISI is to become the institution it is intended to be. The granting of fellowships, in particular for degree studies, is one answer to the problem, provided these studies are directly related to the candidate's future work in TISI.

ASSISTANCE TO THE APPLIED SCIENTIFIC RESEARCH CORPORATION OF THAILAND (ASRCT)

Technological Research Institute, Phase I (THA-16)

79. United Nations assistance in the form of a Special Fund project was requested in 1963 to assist in the establishment and initial operation of the Technological Research Institute (TRI) as the first of the specialized research organizations within ASRCT set up earlier in the same year. The request was approved by the UNDP Governing Council in January 1964. The Plan of Operation was signed and the project declared operational on 19 November 1964. The project was initially approved for five years, but was then extended to October 1970.

80. The project was primarily concerned with developing a Technological Research Institute as the first of the specialized research organizations within ASRCT, and with the development of ASRCT itself. The new body was seen as a mechanism for transferring technology, functioning so as to define development opportunities through surveys and pre-investment studies, providing technical know-how through overseas contacts and literature, reducing this to local practice through adaptive research, developing solutions to local problems through applied research, and carrying the whole process through to the stage of industrial practice by providing consultative engineering services, trouble-shooting assistance and similar techniques. Simultaneously it rendered assistance to ASRCT in the formulation of policies, the establishment of administrative procedures and the development of auxiliary units, which provided a scientific infrastructure for the development of industrial research. The project was based on the proposition that an active, competent indigenous scientific group was essential for the application of science to national development. Accordingly, the assistance rendered was aimed at helping the Institute to provide the scientific and technical basis for the improvement and expansion of existing industries and the development of new industries in Thailand. The Institute would therefore undertake research on technological utilization of natural resources, particularly materials suitable for industrial development, and would solve technological problems presented to it by industry, both in the introduction of new technology and in the utilization of local raw materials. It was expected that research results would accrue during the course of the project and that these would provide data for use in national planning and the expansion and modification of existing policies, and further that they would be applied to the task of stimulating and facilitating industrial development.

81. During the period of assistance, all the major research groups were headed by international experts until the local experts were ready to assume control over the various research programmes. The Plan of Operation provided financing for 23 man-years of international expertise, supplemented by 16 man-years under the United Nations Associate Expert Scheme. They were as follows: chief adviser (74 m/m); organic chemist (24 m/m); chemical technologist (69 m/m); chemical engineer (38 m/m); non-metallic minerals expert (12 m/m); industrial economist (12 m/m); specialist in construction materials (36 m/m); and short-term consultants (0.5 m/m). Associate experts were assigned in the fields of construction materials, organic chemistry and metallurgy. Fellowships were awarded in the following fields: industrial chemistry (2/48 m/m); construction materials (1/24 m/m); and textiles (1/24 m/m).

[illegible]. All the experts performed good work (some of them have remained to undertake the Phase II activities) in the assigned fields, presenting sound and constructive recommendations regarding measures to be undertaken as well as further United Nations technical assistance needed to develop appropriate sectors.

83. The major problem throughout the project has been to find suitably qualified and experienced research personnel for TRI's current and long-term programmes. The number of persons qualified for independent research was small, and with such a small manpower pool, the chance of finding people with specific specialized training was greatly reduced. The comparatively high salary scales offered at ASRCT helped to some extent but the pressure on recruitment persisted as a result of more attractive offers coming from private firms, on the one hand, and the security and fringe benefits provided under the civil service, on the other. These problems also affected the implementation of the fellowship component, to which US$40,000 was allotted for eight nationals to have a full year of training abroad. The limited number of local staff qualified for the various fellowships and the reluctance of those qualified to leave their present jobs without the assurance of receiving higher degrees abroad led to a reduction in the number of fellowships to four. However, the consequent increase in the man/months provided per fellowship gave the recipients sufficient time not only to develop their research skills but also to acquire higher university degrees. In addition to those fellowships, scholarships were provided under bilateral schemes. On-the-job training and regular seminars were also part of the activities of all groups and units in the Institute.

84. UNDP assigned a total of US$257,000 to the project for equipment and supplies, including books and periodicals. The Government, in addition to providing the main building and 1.3 hectares of land at Bangkhen, has built a laboratory building of three floors, each 1,000 square metres, and a semi-basement for the Institute. A larger-type building of 1,000 square metres was also constructed to provide workshop space and a large-scale experimental area. The Government also undertook to provide over a period of five years a sum of US$2,158,930 to enable ASRCT to employ staff for the project and for operating expenses, including the purchase of equipment, supplies and services, and for the construction of new buildings. In addition it agreed to provide US$68,100 towards United Nations local operating costs.

85. The primary objective in establishing the Institute is considered to have been achieved within the five-year period of assistance. The Institute has become a viable research and development organization with considerable national competence in certain fields of technology. During the period of assistance, applied research undertaken by TRI covered a variety of fields, from problem identification through investigational studies to industrial application of research results.

86. A good number of sectoral studies were undertaken as the background to other work and to help in assigning priorities in research strategies. These were often supplemented by visits to specific industrial establishments to examine particular difficulties. Problem solving was usually followed up by literature searches, and use was made of various specialized sources of information in related organizations and elsewhere. In most cases laboratory work was required, either to discover the cause of the trouble or to adapt an existing process to new circumstances or different raw materials.

89. More than forty major projects were initiated in the Industrial Research Institute of ASRCT, relating to the development of industries, particularly those based on agricultural products and local raw materials, food processing industries, ceramics and refractories industries, vegetable oil technology, industrial microbiology, metalworking and mineral-working, and mineral-based industries, as well as the building materials industry. More than half of these projects were satisfactorily completed; others were suspended because of temporary unavailability of specialized scientific staff, and still others were in progress. A number of projects had resulted in industrial application, some of which have had, or are about to have, investment follow-up.

90. Gratifying results were obtained in industrial consultancy services involving both economic and technological considerations. Advice given to industries has been applied, new enterprises are starting and new products are being prepared for manufacture.

91. Regarding co-operation with other government agencies, ASRCT and particularly TRI have been working with the Board of Investment in industrial surveys and pre-investment studies. The TRI has also co-operated in similar studies with the Industrial Finance Corporation of Thailand, a State corporation with the task of financing the establishment of private industrial operations. Priorities for ASRCT work in this field are now determined by the interests of the Board of Investment and the Industrial Finance Corporation of Thailand. Such studies have included association with a United Kingdom consulting firm in examining the potential for export-oriented industries.

92. The importance of adapting technology to local needs has been intensified recently by changes in Thailand's balance of trade and an expected decline in overseas reserves. The Government is now stressing the need for local production in order to reduce dependence on imports and the desirability of industries that can upgrade local raw materials at present exported in crude form.

93. More sophisticated industries are now creating a demand for technical services, which are being increasingly requested from ASRCT. Of particular significance are the demand for help with instrumentation and the demand for calibration services, for scientific and technical documentation and for research services.

94. The help given to specific industries and particular firms has been valuable in overcoming problems encountered and in influencing decisions to engage in new undertakings. Apart from the obvious advantages that have accrued from these endeavours, other intangible but important results must not be overlooked. When the project started, little scientific research was in progress in Thailand. There is no doubt that the rapid build-up of research in ASRCT has stimulated research in other agencies, often as a direct result of ASRCT intervention. This helps set the scene for industrial development. Experience in other countries has demonstrated the importance of the existence of local scientific competence in giving entrepreneurs the necessary confidence to embark on enterprises of technical complexity. The fact that the entrepreneurs know they can obtain appropriate technical advice locally is often of critical importance.

95. It is already clear that the field of chemical process industries offers a major area for potential industrial development in Thailand based on local effort. Thailand already [illegible]

[illegible] Asia.

[illegible] now appear [illegible] for development. [illegible] agricultural raw materials. [illegible] promotion. ASPAC [illegible] programmes of work [illegible] for their expansion.

84. To sum up, the Technological Research Institute, started in 1965, has come of age. It has become the nucleus of applied industrial research in the country. During the short period of its existence the Institute seems to have achieved three major results. Firstly, it has laid a sound foundation for applied industrial research by successfully initiating a number of programmes. Secondly, it has created a substantial team of applied researchers; and, finally, it has been successful in improving the quality of several local raw materials for industrial processing. Owing to the high standards created, the Institute is often consulted by the Government in important industrial matters.

Technological Research Institute, Phase II (THA-71)

85. In order to follow up the initial impact created by the project, particularly in those research programmes which showed clear promise of industrial application, strong support was given by UNIDO to the request of the Government for further assistance to TRI for a period of two and a half years. The second phase project is now under implementation and it is too early to evaluate its performance.

Chemical industries adviser (GIS/70/71)

86. The project was requested in December 1970 and approved by UNDP in February 1971. During his six-month assignment (March-September 1971) in Thailand, the expert worked with ASRCT. Much of his time was devoted to the study of fertilizer production, especially on the Mae Mo plant. He has also carried out an investigation of basic chemical industries.

87. Mae Mo Fertilizer Plant. The principal conclusion of the expert's report was that the lignite-based nitrogen plant at Mae Mo could not operate profitably, regardless of improvements made in the efficiency and output of the plant. In the expert's final report, which was formally submitted to the Government in October 1971, he recommended that a suitable consultant team be engaged to study viable alternative uses for the Mae Mo site and the existing manufacturing facilities. It is still too early to expect any specific action to have been taken on the recommendations.

88. Basic chemical industries. The expert reviewed the general situation of the basic chemical industries of Thailand and their possibilities for future development. Although further exploration would be required, the expert has done his part in presenting the existing situation and the various problems that need to be studied and solved in future development. For the promotion of the development of basic chemical industries, some measures have been recommended by the expert such as allowing the producers of basic chemicals to import the essential primary raw materials free of duty, giving them a minimum of protection for a limited initial period etc. It may be too early to predict the impact resulting from the present project, but it is hoped that it may lead to further development of the basic chemical industries.

Assistance in examining projects for the manufacture of radio and television parts (SIS/70/340)

99. Requested in April 1970, the project was implemented a year later because the expert selected for the three-month assignment was not available immediately.

100. The expert, an electronics consultant, performed a study on the electronics industry in Thailand and its future potential. On the basis of this study, he suggested steps to be taken to promote the development and expansion of the Thai electronics industry.

101. The expert produced a thorough study of the local situation and potential of this industry including a projection of the increasing demand for electronic products during the next five years. This demand is estimated to double within this time period, providing a unique opportunity for the development of a more sophisticated electronics industry in the country. Problems hampering the growth of that industry have been identified. The suggestions made in the expert's final report, which was submitted to the Government in November 1971, should provide a basis for future government plans and policies to promote and achieve the proposed development of the Thai electronics industry. The expert worked with both ASRCT and the Board of Investment.

Manufacture of farm and artisan hand tools (SIS/71/1162, THA-26)

102. Requested on 25 August 1970 and approved by UNDP on 22 February 1971, this project is being implemented by a consulting team. This team will evaluate the need for local manufacture of farm and artisan hand tools. This evaluation will consider supply (local and imported) and demand (present and projected), the local facilities needed to meet demand and suggestions for plant layout, together with the equipment required to produce a competitive product.

Manufacture of small internal combustion engines (SIS/71/1163, THA-27)

103. Requested and approved simultaneously with the preceding project, this project will be implemented by a team of consultants. Bids for the contract have been received. The consulting team will evaluate the desirability and feasibility of manufacturing small (up to 5 HP) internal combustion engines within Thailand, primarily for use in agriculture but also for other applications such as river transport. Since the project has yet to be implemented, an assessment cannot be made at this time.

Feasibility study for the establishment of an integrated iron and steel industry in Thailand

104. The UNIDO Senior Interregional Adviser on the Iron and Steel Industry visited Thailand in July 1970 for a two-week exploratory mission on the feasibility of establishing an integrated iron and steel industry in the country. One outcome of this mission was the Government's request in April 1971 for SIS assistance in preparing a detailed project report for the establishment of an integrated iron and steel plant in Thailand, preferably at a deep-water coastal site. While the request was being studied, UNIDO was informed that the Government had decided to grant promotional privileges to a private party to undertake the establishment of an iron and steel plant in Thailand, thus removing the need for the project study requested. The UNDP Regional Representative informed UNIDO in August that this request was to be considered as effectively withdrawn. However, it is understood that the need for pre-investment studies to formulate detailed policies for promoting this industry still exists, and a reformulated request is expected from the Government.

Assistance in quality control for the production of hot-dipped tin plate (SIS/71/1416)

105. UNIDO is recruiting an expert to assist ASRCT in solving problems associated with the production of hot-dipped tin plate. While a number of these have been overcome, assistance is required in consolidating the improvements already achieved and in improving further the quality control procedures. The project was approved by UNDP on 20 August 1971. No assessment can be made at this time.

ASSISTANCE TO THE BOARD OF INVESTMENT

Rubber products industries adviser (SIS/69/594)

106. This project is part of a series of expert studies of individual industries in Thailand requested by the Board of Investment, which has been given primary responsibility for promoting the country's industrialization. Thailand is a significant producer of rubber but has a limited rubber products industry. The expert was expected to advise the Board of Investment on investment opportunity identification, project promotion and evaluation. The request for a two-month mission was forwarded to UNIDO on 12 May 1969. UNDP, in considering the request, suggested that the project could be carried out as part of the Special Fund rubber development project for which FAO is the executing agency. The preference of the Government for using UNIDO's services and the fact that the purpose of the mission clearly went beyond the scope of the Special Fund project, finally led UNDP to approve it on 26 September 1969. Candidates were submitted around three months later. Selection was made by the Government on 20 March 1970. The selected candidate reported for duty in mid-June.

107. The production in 1970 of crude rubber was estimated at more than 300,000 tons of which only 7,000 tons was used within the country. Approximately 40 per cent of the crude rubber was exported to Japan, and the expert therefore recommended that an extensive market survey for crude rubber be made on the Japanese market. This survey would make it possible to define plans for the development of crude rubber processing and to build up the marketing organization required.

108. There was a general lack of technological know-how in a field where rapid progress was taking place. The expert suggested that the leading technicians of local firms engaged in rubber production undergo a technical course combining lectures and actual regular work in the factories. He also felt that, on a long-range basis, Thailand must become independent in crude rubber processing and rubber technology in general. To that end, the possibility of establishing a research laboratory combined with a well-equipped processing unit should be investigated.

109. The best production opportunities were probably to be found in the automotive industry. There also appeared to be possibilities in the production of foam rubber, rubberized coir, latex dipping goods, and sundry products. The expert stressed, however, that production opportunities could not be regarded separately; they could be considered only in connexion with know-how, marketing channels and managerial initiative. The final report was forwarded to Bangkok on 17 November 1970.

110. ASRCT is requesting a six-month short-term consultant on rubber goods production as a direct follow-up of the expert's recommendations.

Food processing industry adviser (SIS/71/1149)

111. The request was made in December 1970 for assistance to the Board of Investment in evaluating existing food industries in terms of product range and capacity and in identifying new opportunities for investment. It was approved by UNDP in February 1971 and candidates were submitted to the Government in June. Selection was made the following month and the Government's nominee reported for a three-month assignment towards the end of September. The expert assigned had wide experience in the food processing industry, which enabled him in a short mission to obtain a thorough knowledge of the country's situation in this field and to give specific proposals aimed at overcoming the problems affecting the industry and opening up new avenues for its development. The more urgent measures that he recommended were to reorganize the industry and to rationalize the governmental services supporting it. The final report was submitted to the Government in January 1972.

Garment industry adviser (SIS/71/1149)

112. Requested and approved simultaneously with the post of food processing industry adviser, the post covers similar ground, being concerned with evaluation and identification of investment opportunities in the garment industry. The expert was assigned in September and carried out his assignment fully in accordance with his job description. In addition he arranged for in-plant training in the United States of America for Thai nationals and assisted local manufacturers in the purchase of equipment. His long experience and wide contacts in the garment industry were very valuable assets, the results of which were fully appreciated by the Government.

CHAPTER III: EVALUATION OF FELLOWSHIPS AND TRAINING ACTIVITIES

113. In view of the large number of participants in UNIDO training activities and recipients of fellowships during the period under review, and in order to facilitate the evaluation work, a separate section on this subject seems justified.

114. According to the guidelines for evaluation of fellowships and training activities, the following points should be considered:

(a) Qualifications of fellows nominated by Government in relation to training requested;

(b) Adequacy of training programmes arranged by UNIDO;

(c) Use made of training acquired by fellows on return to home country.

115. Guide line (a) may be said to be primarily concerned with individual training programmes in the form of fellowships. Thirteen[4/] fellowships have been awared over the period 1967-1971. Guideline (b), while applicable to fellowship holders as well, is more closely related to the training programmes, seminars and workshops arranged by UNIDO in which some 41[4/] Thai nationals participated. In order to abide by guideline (c), UNIDO has recently established a follow-up system consisting of questionnaires sent to ex-participants after they have returned home and arrangements to keep some form of contact with them. The latter activities have just begun and their results at this stage cannot be measured. The following initial conclusions can be drawn

4/ Provisional figures.

[illegible] Asia.
[illegible]

[illegible] three for males), [illegible] training, [illegible] training work-[illegible]. [illegible] administrative [illegible] could be eval-[illegible]; [illegible] work needs to be undertaken to complete the whole, [illegible] on indus-[illegible] training.

Individual training programmes (fellowships)

[illegible]. The gap between official request and actual implementation of the programme was rather long, in some cases up to three years and usually one or two years. The difficulty is primarily centred around the right placement of the candidates.

117. Some of the programmes have been satisfactory, others less so. Where the training was satisfactory, the training sought conformed with the actual programme. In some cases, however, the programme did not correspond to the request, and in one case the training was not relevant at all.

118. All of the candidates satisfy the educational requirements and already hold important positions; some are senior personnel, others are in middle management positions. The selection of the candidates is in general good. Language seems not to be an obstacle to training; some received their university education in the United States of America, others in European countries.

119. All the candidates were eager to apply their acquired knowledge and skills upon their return home. In some cases, although the subjects studied were not quite the same as in their home country, they can make good use of the relevant aspects of these subjects.

120. In one case, an accident resulted in the candidate's having to postpone his programme after recovery. Because of this postponement, part of the training programme did not work out according to the revised schedule. Some adjustments had to be made by the participant himself. There are no cases where the participants went home earlier than anticipated; all followed the required programme. Many of the wishes of the candidates to study in certain countries could not be fulfilled because of placement difficulties, for instance in the United States of America.

121. The training is sometimes given in the form of study tours; the purpose of such training is a comparative study of experiences in several countries. This kind of comparative study seems to meet the wishes of the candidates. Such studies are useful for the exchange of experience and knowledge and for comparing systems.

122. Difficulties were experienced in combining studies in institutions with practical studies elsewhere; the situation should be improved so that the participants can become acquainted with the practical aspects besides receiving training in educational institutions, at universities or at other training centres.

[illegible]. In conclusion, one may say that the total resources utilized for training well-qualified personnel from [illegible] are rather small, but the expenditure is justified. The number of in-[illegible] [illegible] should be substantially increased.

In-plant group training programmes

124. Whereas in the period 1966-1972 UNIDO has offered Thailand the opportunity to participate in about 40 in-plant training programmes, the country has so far sent only fourteen candidates. Only fourteen candidates have been accepted for the various courses. The candidates participated in training programmes organized in Sweden on maintenance and pulp and paper; in the United States of America on pesticides; in Austria on plastics technology; in the Union of Soviet Socialist Republics on iron and steel; and in Japan on the mechanical engineering industry. Thailand has the required industrial base, and many sectors of industry are well developed; it should therefore be able to send more personnel (technological as well as managerial) for training under the programmes offered by UNIDO. Besides, Thailand should be in a position to send qualified candidates because there are sufficient graduate engineers and technically qualified personnel who are in need of training in industrialized countries to upgrade their knowledge and skills.

125. Thailand could well make more use of the opportunities offered by UNIDO of in-plant training in various fields of activities.

Seminars and training workshops

126. The same opinion relates to participation in seminars and training workshops that are offered by UNIDO. Thailand participated mainly in regional seminars for the ECAFE region or interregional seminars. In general, it may be stated that seminars and training workshops offered by UNIDO to the developing countries are not utilized as fully as they might be by Thailand.

Follow-up activities

127. It is too premature at this stage to evaluate follow-up activities. Questionnaires are sent to former recipients of individual fellowships and former participants in in-plant training programmes. The participants are encouraged to state their opinions on the effectiveness of their training in relation to the following aspects: whether the participant's employment is unchanged or has undergone some change; promotion or transfer; present position and future outlook after training; impact of training upon his company, environment or himself; applicability of what he has learned to his occupation; whether his acquired knowledge is transferable, if so, how this knowledge can be transferred continuously; what the position of his family was while he was away; and whether the employer kept his position open. As the responses to the questionnaires are not yet in, it is impossible to evaluate the reactions of the participants.

CHAPTER IV: SUMMARY AND CONCLUSIONS

128. Although no attempt has been made to compare the size and volume of UNIDO's technical co-operation programme with that of other organizations of the United Nations system or with that of the over-all external assistance received from bilateral and multilateral sources during the last five years, it can be safely said that UNIDO has been fairly active in Thailand. On the average UNIDO has provided 16/116 man/months of expert service each [illegible] since 1961. A yearly average of twelve Thai nationals have taken the opportunity of further training through

overseas fellowships or through participation in workshops, seminars and in-plant training programmes. The average yearly costs of providing expert services, fellowships and equipment has been US$.771,000.

129. From the review of the individual projects it is evident that the Government has laid emphasis on building up its capacity for industrial development, i.e. the necessary infrastructure in the form of institutions designed to offer selected kinds of services to industry. The impact of UNIDO's assistance in this field is not easy to assess in precise terms principally because institution-building is of a long-term nature, the effects of which may not be immediately visible. What is certain, however, is that expert service and assistance have paved the way for, and at times accelerated, certain national decisions to strengthen existing institutions or to lay the foundation for new ones.

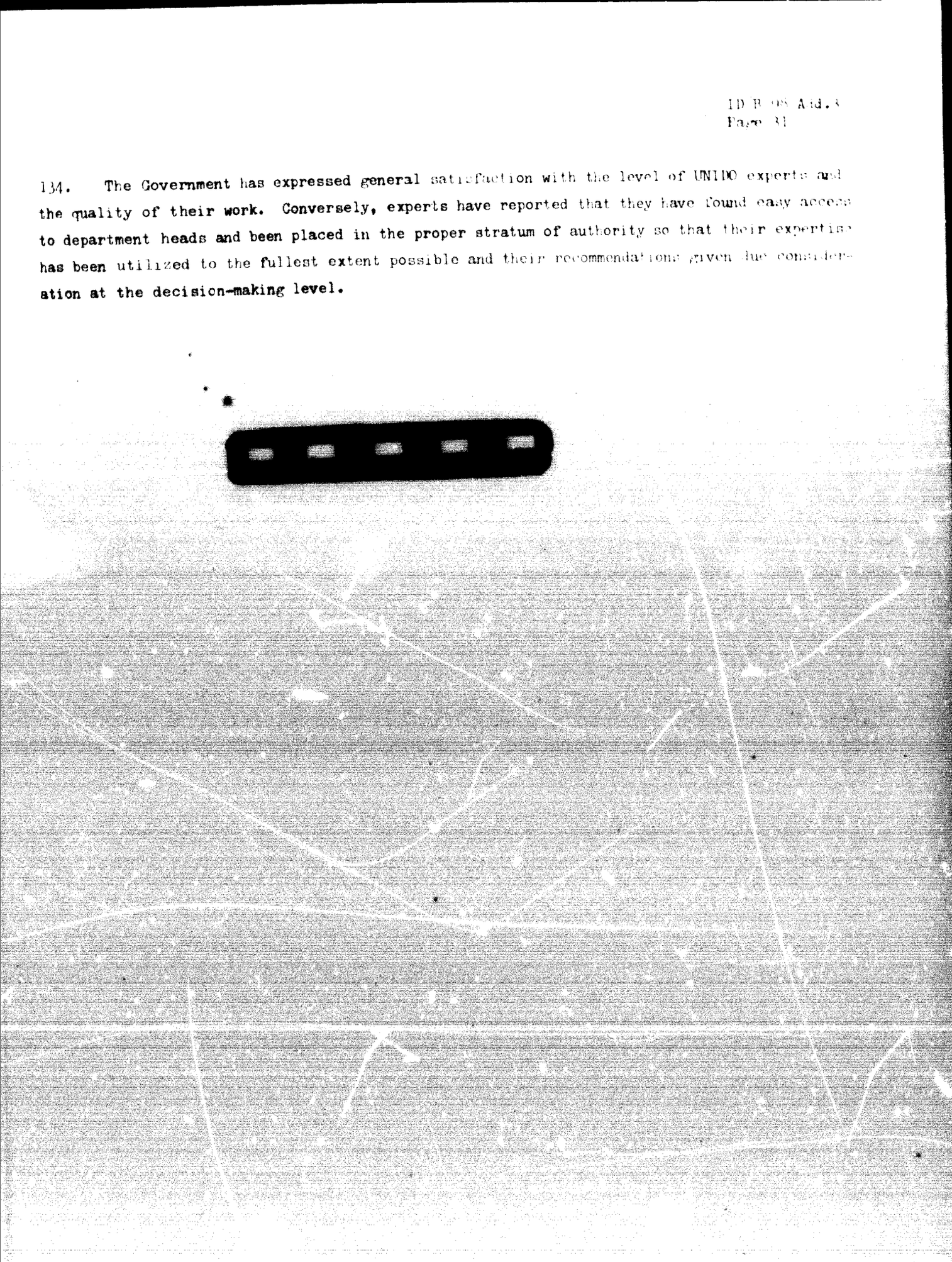
130. Future UNIDO assistance is expected to continue along the lines of institution-building, for which a sizable number of experts and fellowships, and some equipment, will be required. In addition to the large-scale projects already operational, i.e. the Technological Research Institute (Phase II) and the Thai Industrial Standards Institute, UNIDO has been called upon to assist in strengthening the Industrial Services Institute and is expected to help in establishing a textile institute, a packaging design centre, an industrial estate organization, an industrial information and studies centre etc.

131. The preponderance of assistance projects in food and agro-related industries necessarily calls for greater harmonization and co-ordination of efforts between UNIDO and FAO. There are a number of projects where delays of implementation are partly attributable to problems of inter-agency jurisdiction.

132. Similar problems are bound to arise in the area of export promotion and marketing, which will receive special emphasis during the third development plan. UNIDO and UNCTAD will have to co-ordinate their approach to the Government's requests for international assistance in its efforts to reorient industrial development from import substitution to export production.

133. Some difficulties have been encountered in providing adequate personnel capable of continuing the work initiated through UNIDO assistance. This is especially true in top-level positions for which stringent local requirements are imposed, such as the holding of higher university degrees. Because foreign degrees tend to assure better placement opportunities, UNIDO fellowships, despite their inherent limitations of time, budget and objectives, have, more often than not, been utilized by Thai nationals with a view to obtaining higher academic degrees. Conversely, fellowships tended to be used less than they should be because of the lack of assurance that a higher academic degree could be obtained thereby. The pressure of higher salary prospects in the private sector also adds to the difficulty of recruiting qualified and well-trained personnel to man the institutions that have been established. More attractive incentives will have to be offered by the Government if these institutions are to function properly.

134. The Government has expressed general satisfaction with the level of UNIDO experts and the quality of their work. Conversely, experts have reported that they have found easy access to department heads and been placed in the proper stratum of authority so that their expertise has been utilized to the fullest extent possible and their recommendations given due consideration at the decision-making level.



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