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FEASIBILITY

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PACKAGING

REPORT

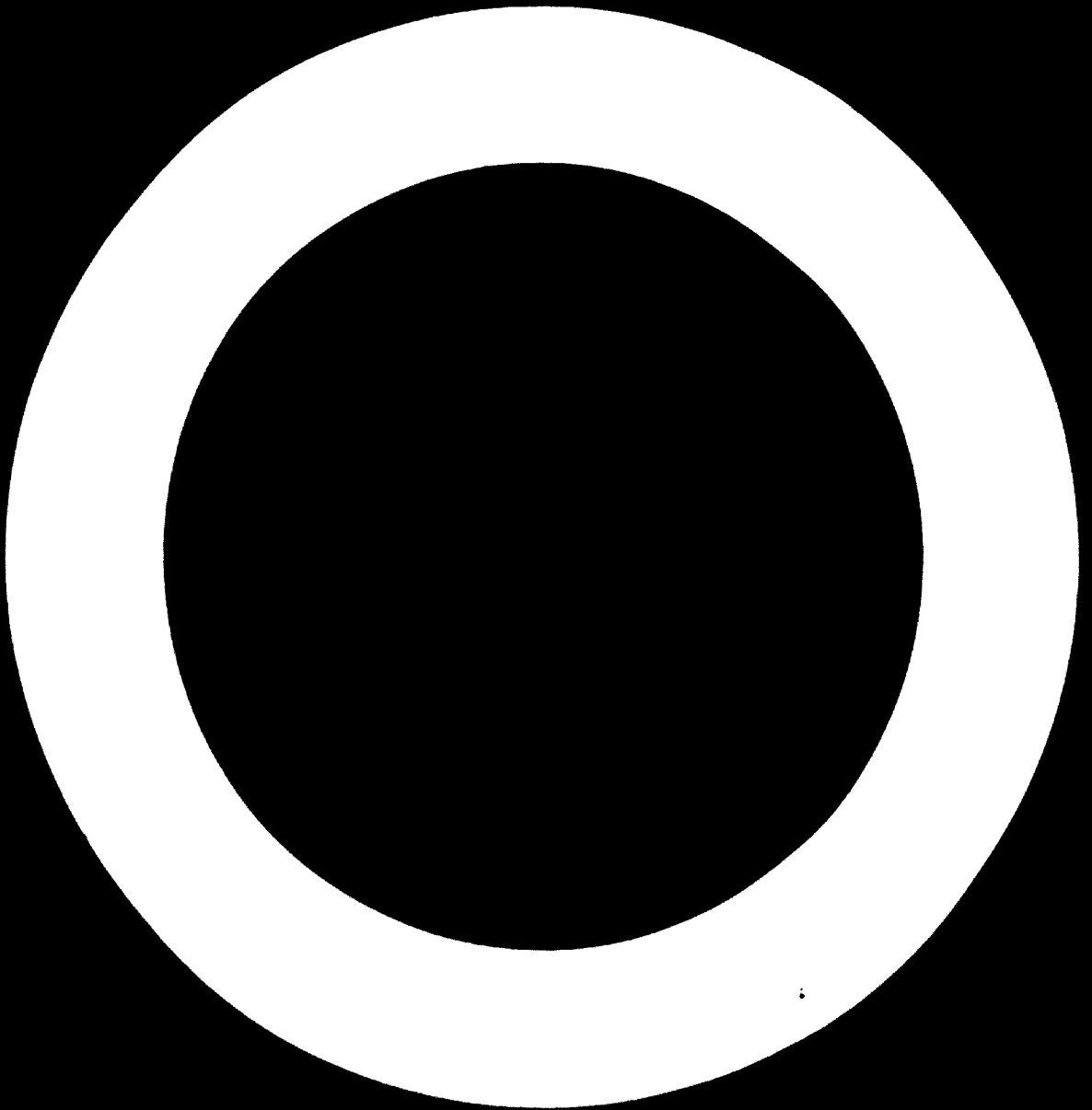
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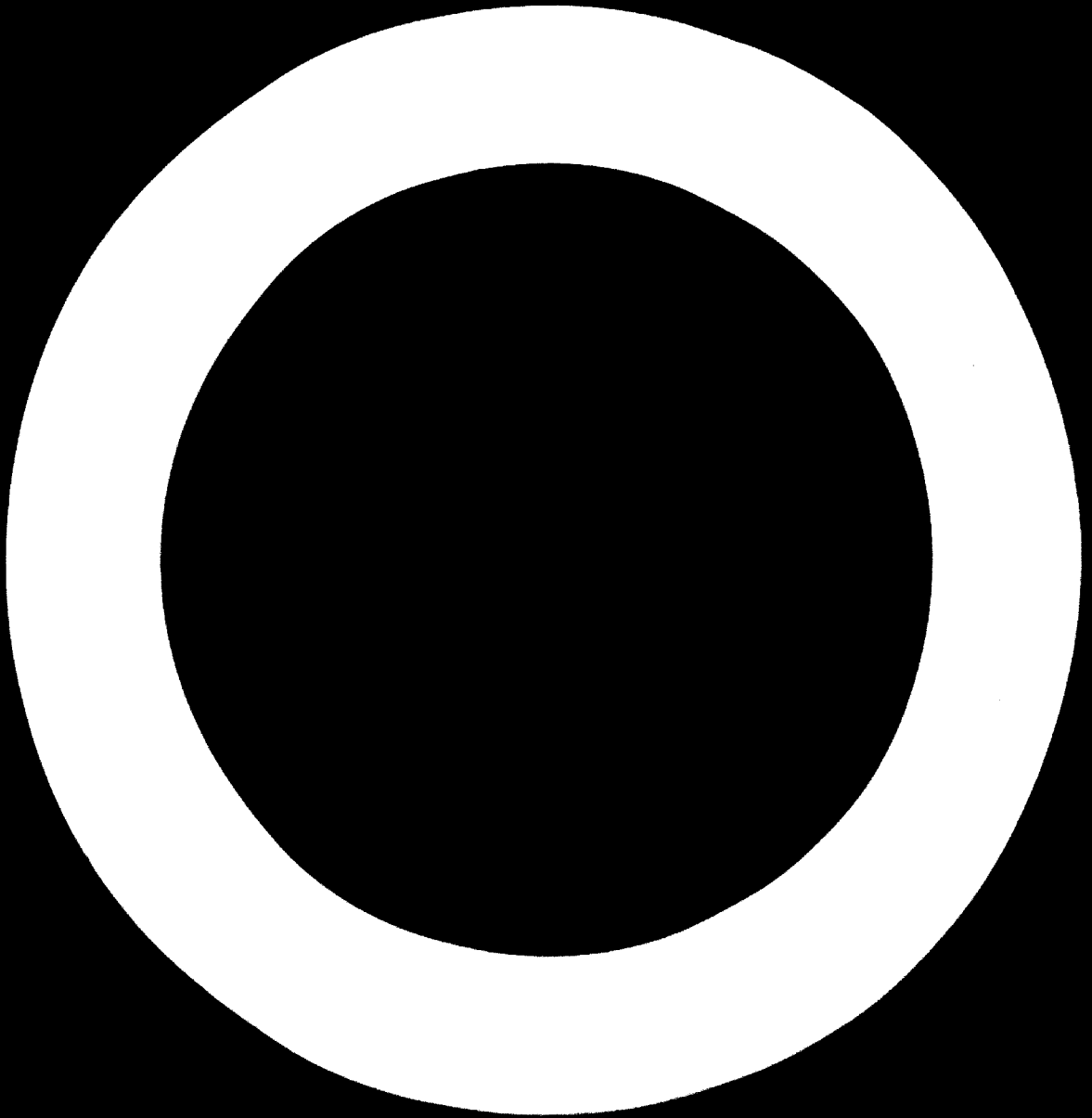
1964

Prepared for the

United States Government

Washington, D.C.





United Nations Development Programme

FEASIBILITY STUDY ON PACKAGING

IS/IND/73/011

BURMA

Project findings and recommendations

Prepared for the Government of Burma
by the United Nations Industrial Development Organisation,
executing agency for the United Nations Development Programme

Based on the work of Herbert Harnicks, expert in packaging

United Nations Industrial Development Organisation
Vienna, 1975

Explanatory notes

Reference to "tons" indicates metric tons.

A slash (/) between dates representing years indicates a crop year or financial year, e.g. 1971/72.

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SUMMARY

The project "Feasibility Study on Packaging" (IS/BUR/73/001) of the United Nations Development Programme (UNDP) was carried out, in response to a request from the Government of Burma, from 4 July 1974 to 9 August 1974 by the United Nations Industrial Development Organization (UNIDO) acting as executing agency for UNDP. The UNDP contribution to the project was \$5,150 to cover the costs of providing the services of an expert in packaging for six weeks and the services of a UNIDO staff member for one week.

This report describes the background and results of the survey mission undertaken by the expert, the objectives of which were to study the requirements of the country, to suggest ways of improving packaging production and of raising standards of quality, and to prepare specifications for a packaging pilot plant to supply small enterprises with appropriate packaging media.

The Packaging Materials and Container Corporation provided counterpart personnel, an interpreter, transportation and use of other facilities to ensure that the objectives of the programme would be met within the allowed time. At the beginning of the mission, the Minister of Trade pointed out that problems in packaging in Burma were enormous and that little more than a perfunctory survey could be carried out in the time available.

According to the work plan of the mission, the expert was to perform the following functions:

- Designating the complete information needs of the study
- Gathering all previous reports and available data sources
- Working out questionnaires for users and producers of packaging
- Conducting field visits to representative companies and institutions
- Analysing data obtained from available sources and completed questionnaires

It should be noted that the original job description, as given in annex I, did not meet the requirements of the Government; it was therefore altered to include a greater emphasis on training.

It was found that, despite honest endeavours by the various enterprises engaged in this field, the productivity of the packaging industry was low

and the quality of the staff was poor because of lack of knowledge and inadequate facilities. It is therefore recommended that a long-term strategy for development of both staff and facilities be immediately adopted.

In the short term, expert assistance is needed to cover immediate needs. In the long term, a national techno-economic centre for packaging should be established that would make specialist training, information services, and research and development facilities available to industrial enterprises.

Annex II lists the persons met and institutions visited during the mission.

INTRODUCTION

Background information

Industry in Burma is a mixture of handicrafts and small-scale production, which implies comparatively high manufacturing costs. To make matters worse, the packaging of the goods produced is inferior, for the standards in the packaging industry are very low. As a result, the Burmese economy has suffered a tremendous loss in both the export and the domestic market. Difficulties in marketing arise because of the poor presentation of the goods, and considerable losses occur because the packaging fails to preserve the goods it is supposed to.

Objectives of the programme

The objectives of the programme were changed from those outlined during the expert's briefing in Vienna at the request of the Government in light of an in-country review of the industry. The programme finally agreed upon by the Minister of Trade and the expert included the following tasks :

- (a) To study the requirements for packaging media and packaging containers for the most important products on the domestic market and for export;
- (b) To examine the feasibility of establishing a pilot packaging enterprise to supply small national producers with packaging media;
- (c) To make recommendations regarding specifications of a packaging pilot plant and to formulate a request for follow-up technical assistance if required;
- (d) To provide training on the job for the staff of the Packaging Materials and Containers Corporation in packaging for all types of market;
- (e) To survey packaging in Burma and identify problems;
- (f) To give advice and make recommendations for further development.

Work plan

To accomplish these objectives in the short time of six weeks allowed for this project called for a very efficient use of time and personnel. Therefore, the expert tried to make all officials understand how important the mission was for the development of the country. To obtain the needed information quickly, questionnaires for users and producers of packaging were prepared and circulated (see annexes III and IV). The Minister of Trade

and his officials gave all possible help. The counterpart for the project was U Khin OO, Managing Director, Packaging Materials and Container Corporation, who also acted as chairman of a Corporation committee formed to assist in making the survey.

The work carried out consisted of:

Gathering all available relevant reports and statistics from the Government, corporations and factories

Deciding what information was still needed for the study and gathering it through questionnaires and personal interviews

Analysing in conjunction with a UNIDO staff member the data and information for the final report

A UNIDO staff member attended as part of the project in order to bring together the information for inclusion in the country programme.

I. SECTORAL SURVEYS OF THE PACKAGING INDUSTRY

Wooden boxes

To establish priorities by identifying problems and evaluating areas within the packaging industry, the expert surveyed the industry by sectors.

A small workshop in Okyin produces manually about 200 boxes made of pine and Kanyin wood per day. The workers work only one shift, since they fear the machines will break down and have to be repaired during the night hours. The circular saws used are not powerful enough; they are too old and in very bad condition. At least 7-10 new circular sawing machines of 15-20 hp are needed. A saw of this kind (including spare parts) costs between \$1,500 and \$2,000. The estimated requirements for wooden boxes by government departments and corporations are :

<u>1975</u>	<u>1975/76</u>	<u>1976/77</u>	<u>1977/78</u>
155,000	161,000	167,000	183,000

An investment of about \$20,000 should be sought as soon as possible. If this investment is made, adequate supplies of wood should be assured.

Glass factory

A glass factory situated at Syriam, about 40 miles from Rangoon across the Irrawaddy River, started production in 1969. It now has an output of about 25 tons/day. Table 1 gives production targets for 1974-1975.

With this production the factory can meet only about 20 per cent of the demand.

Beer bottles are packed in gunny bags and transported with straw between the layers. Damage during transport is high. The expert estimated it at about 10-20 per cent, but it was not possible to quantify the actual data.

Tumblers and small medicine bottles are packed in wooden boxes with strips of locally made paper in between. Losses in transport from the factory alone are said to be between 2 and 6 per cent. Other medicine bottles are packed and transported in gunny bags. The damage in the pharmaceutical industry is about 20 per cent during transport from Syriam to Burma Pharmaceutical Industry (BPI), another 2-3 per cent damage in the packaging process and 1-2 per cent during transport to the customers.

Table 1. Production targets of Syrian glass factory, 1974-1975

Serial No.	Commodity	Quantity (thousand pieces)
1.	Beer bottles, 24 oz	3,000
2.	Round medicine bottles, 4 oz	1,400
3.	Medicine powder bottles, 4 oz	900
4.	Round medicine bottles, 12 litre	600
5.	Medicine powder bottles, 1 oz	3,000
6.	Balm bottles, 1 oz	1,300
7.	Whiskey bottles, 24 oz	1,750
8.	Cold drink bottles, 9 oz	1,000
9.	Medicine powder, 12 oz	800
10.	Ink bottles, 2 oz	1,200
11.	Ink bottles, 8 oz	500
12.	Others	2,000
	Total	18,250

It should be noted that NPI can only work on a 1.5 shift basis because of insufficient delivery of packages, especially glassware. By using specially constructed pallets for transport from Syrian to NPI and during storage, damage could easily be reduced to about 2-5 per cent.

Tins

Tins are used at the fruit-canning plant in Hama and for special fish products in Raqqos. The cost of production of these goods is so high that they are distributed only in home markets, mainly because the high cost of the tins.

Since there is no domestic production, all tin sheet and semi-finished tins are imported. In the opinion of the expert, more selective buying could reduce the price by 20-30 per cent. The quality of the sheet could also be reduced to 75 per cent of the present standard. The production target for tins in 1974/75 was about 1 million pieces.

However, because imported sheet tin is extremely expensive, it will be difficult to establish an export market for tinned products until local production of sheet becomes a reality, which is unlikely in less than five years.

Gunny bags

Jute bags, locally called gunny bags, are the general-purpose packaging medium used for almost all types of goods. Most of the gunny bags are produced in Burma, the remainder imported.

The estimated requirements for gunny bags for government departments and corporations are as follows (million bags):

<u>1974/75</u>	<u>1975/76</u>	<u>1976/77</u>	<u>1977/78</u>
58	60	61	64

The gunny bag sector of the industry is a very important one. Because of their availability, gunny bags are used for purposes for which they are totally unsuitable. In the present state of the packaging industry, there is almost no alternative to this practice; therefore, it is imperative that development of more suitable packaging media be undertaken immediately.

Paper and paper board

It was not feasible to obtain from any reliable source statistical data that would permit analysis of supply and demand for paper and paper board. However, it is estimated that since the domestic production of paper suitable for packaging is only about 900 t/a, in all probability some 20,000-30,000 tons of these materials are imported annually.

The major reason for lack of statistics is the multiplicity of purchasing centres for packaging materials, a situation that results in inefficient trading. To enable larger orders to be placed with a price advantage, to utilize optimum materials for the type of packing specified, and to ensure control of foreign currency expenditure, consideration should be given to centralising purchasing within the Packaging Corporation. Table 2 gives data on production of packaging and packaging materials and imports in 1973 and expected annual demand.

Table 2. Production and consumption of packaging

Type of packages and/or materials	Production and imports, 1973	Expected annual demand (government and private)
Plastic (tons)	1,500	7,000
Tins (tons)	4,000	13,000
Glass (pieces)	18,000	90,000
Paper and paper board (tons)		
Home production	900	
Imports	20,000-30,000	20,000-30,000
Gunny bags and gunny twine (pieces)	70,000	100,000
Wooden boxes (pieces)	45,000	160,000

II. CONCLUSIONS

1. The packaging industry in Burma is inadequate in terms of both quality and quantity for serving the domestic and export markets.

2. There is an excessive reliance upon imported packaging materials, although these materials could be produced domestically, which would reduce the outflow of large amounts of currency.

3. Imported packaging materials cost more than necessary owing to the absence of a centralized buying system.

4. Production methods for packaging are, by and large, primitive; where comparatively modern production lines exist, they are inefficient.

5. Losses of some packages (e.g. glass bottles) during delivery to users are high owing to ineffective packaging and transport systems. Types of packaging and means of transport must both be improved.

6. A considerable effort should be made to increase the supply of materials, to improve manufacturing methods, and to increase greatly the number and size of units manufacturing packaging materials to meet the needs of industry.

7. Planning should commence immediately for additional units to fulfill the requirements of national growth targets.

III. DERIVATION OF PLAN FOR FURTHER ACTION

Subsequent to the arrival of the UNIDO staff member and his discussion with the UNDP resident representative on the progress made with the survey and its effect on the country programme review then under way, a strategy was derived for the development of the packaging industry in conjunction with the pulp and paper industries and incorporating the findings of the information that had been elucidated during the previous four weeks.

This strategy was discussed with the Manager of the Packaging Corporation and subsequently with Nem Thet San, Head of the Central Research Organization; U Mai Aung; and John Whitney, Project Manager, UNIDO Applied Polymer Research Laboratory, and other members of the staff. At this meeting it was suggested that since it was estimated that 70 per cent of the packaging requirements of Burma could be met through use of paper products (see annex V), the development of the pulp and paper project and the packaging project to be proposed in the country programme should be complementary and phased in harmony. After some discussion, a procedure was agreed upon.

The proposal was later discussed with the Minister of Trade, who concurred with the ideas put forward, particularly since the strategy could be expanded to include a current FAO project for the development and expansion of forestry. Thus the Burmese Government could be presented with the possibility of an integrated development of related and complementary industries. The strategy in its final form is given in annex VI.

IV. RECOMMENDATIONS

1. A firm strategy for the complementary development of the Forestry, pulp and paper, and packaging industries on the general lines set out in annex VI should be developed. Linkages between these industries are so strong that they are generally interdependent.

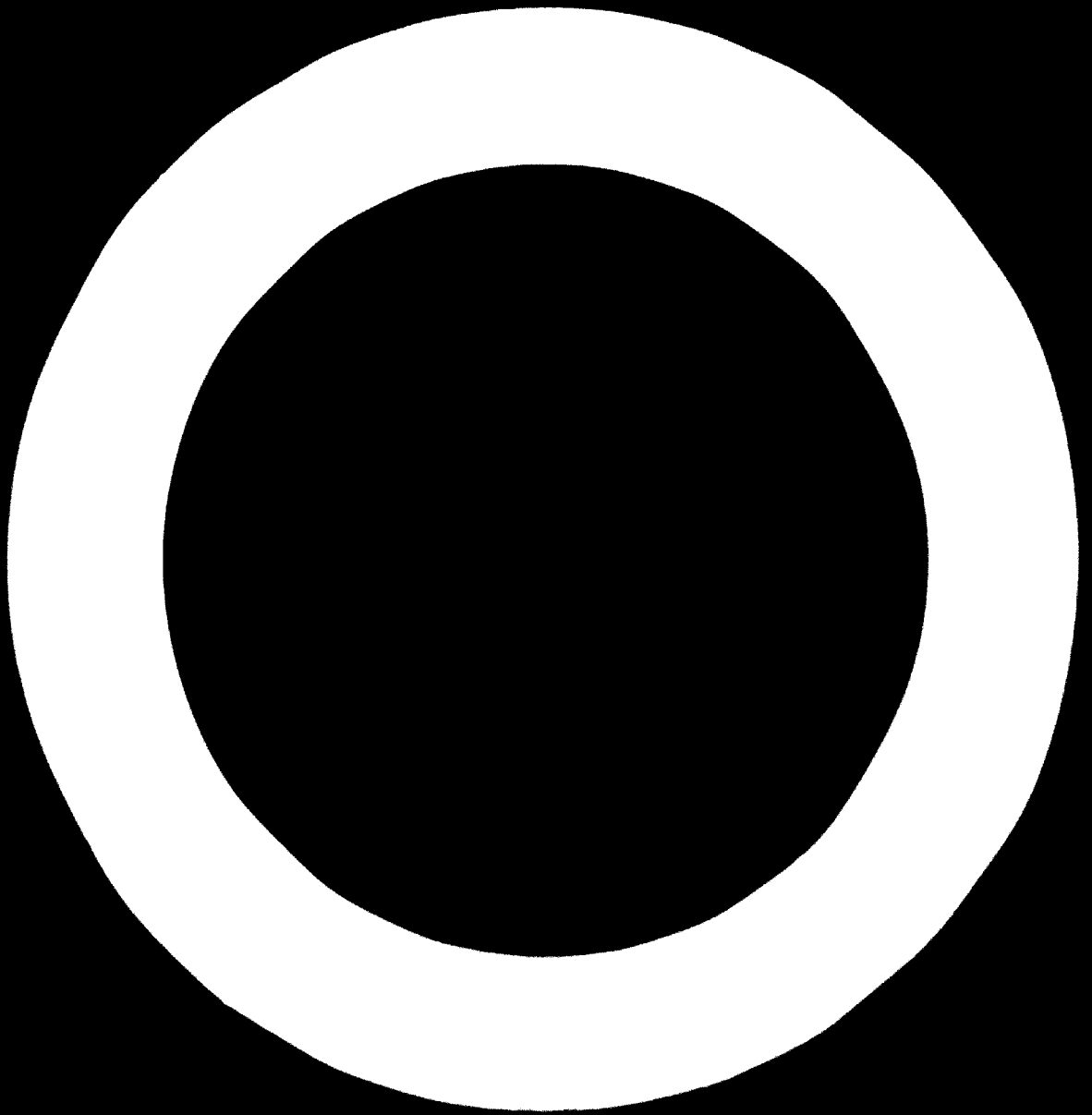
2. As a first and immediate step in tackling some of the urgent and obvious problems noted in the survey, a national techno-economic development centre for packaging, as set out in annex VI, should be established. In view of the great wastage of produced goods owing to inadequate packaging, the establishment of this centre should be given the highest priority.

3. Responsibility for the specification and purchase of packaging materials for all industrial and trade enterprises should be centred immediately in the Packaging Materials and Container Corporation.

4. In view of the time involved in establishing the recommended centre, three experts, one each in food packaging, paper packages and transport packages, should be immediately recruited to serve for a period of at least six months. One of the three should be designated Chief Technical Adviser to the Packaging Corporation and would have the additional duty of working out the details of the multidisciplinary strategy.

5. Training fellowships in food packaging, paper packages and transport packages should be granted to three appropriate staff members of the Packaging Materials and Container Corporation.

6. An adequate scheme for maintenance and repair should be put into effect without delay. Obsolescent machinery, particularly in workshops manufacturing wooden crates, should be systematically replaced.



Annex I

JOB DESCRIPTION

IS/BTR/73/011

POST TITLE	Adviser on Packaging
DURATION	Six weeks
DATE REQUIRED	As soon as possible
DUTY STATION	Rangoon, with trav. within the country
PURPOSE OF PROJECT	To study the requirements of the country in packaging production and to prepare specifications for a packaging pilot plant to supply small enterprises with appropriate packaging media
DUTIES	<p>The expert will serve as adviser to the Government and will be expected to:</p> <ol style="list-style-type: none">1. Study the requirements for packaging media and packaging containers for the most important products on the domestic market and for export;2. Examine the feasibility of establishing a pilot packaging enterprise to supply small national producers with packaging media;3. Make recommendations regarding specifications of a packaging pilot plant and together with a UNIDO staff member formulate a request for follow-up technical assistance, if required;4. Discuss with national experts and a UNIDO staff member the possibility of setting up a pilot enterprise for pewter container production and make recommendations regarding its specifications and United Nations technical assistance for the realization of the project.
QUALIFICATIONS	Economist with extensive experience in the field of packaging
LANGUAGE	English
BACKGROUND INFORMATION	<p>The growing role of packaging, particularly in improving the marketing of locally produced goods at home and abroad, has been recognized and appreciated by the Government. It is felt that fruit, fish, meat and milk processing industries might strongly increase sales of their products through the use of appropriate packaging systems and application of modern containers for preserving and dispatching the goods.</p> <p>It therefore would be useful to obtain United Nations technical assistance with a view to establishing a packaging pilot plant for manufacturing containers to supply the fruit, fish, meat and milk processing industries in the country.</p>

Annex II

PERSONS MET AND INSTITUTIONS VISITED DURING FIELD WORK

U Khin Win	Packaging Corporation
U Myint Aung	Packaging Corporation
U Win Naing	Packaging Corporation
U Aung Hla Htoo	Planning Manager, Packaging Corporation
U Thaung Kyi	Budget Manager, Packaging Corporation
U Soe Myint	Workshop Manager, Packaging Corporation
U Kay Dun	General Manager Corporation No. 17 (Mineral Products)
U Kyaw Nyunt	Deputy General Manager Corporation No. 3 (Animal and Animal Products)
U Shan Htatt Pe	Manager Pearl and Fishery
U Tun Tin	Director Foodstuff Industry
U Hnang Shein	General Manager Corporation No. 2 (Marine Products)
U Aung Thein	General Manager Corporation No. 3 (Animal and Animal Products)
U Kay Dun	General Manager Corporation No. 17 (Mineral Products)
U Ko Ko Gyi	General Manager Corporation No. 19 (Gems and Jewellery)
U Myant Tin	Manager Scott Market
U Myint Lwin	Manager Nee Nee Press

Daw Tin Myint Htay	Sales Manager
U San Win	Minister of Trade
Kann Thet Zan	General Manager Union of Burma Applied Research Institute
J.E.S. Whitney	Project Manager Establishment of Applied Polymer Research Lab
U Hla Pe	Manager Rangoon Dairy Farm
U Bar Bar	Sales Manager Corporation No. 14 (Electrical Corporation)
U Tin Aung	Production Manager Foodstuff Industry
U K. Ba Thaung	Managing Director Pearl and Fishery
U Hla Thaung	Director Burma Pharmaceutical Industry
U Ba Thaung	Manager Syrian Glass Factory
U Ba Thi	Owner Private silverware manufacturer
Daw Yi Yi Non	Owner Private strawberry toffee factory

Meeting at Pagan Hotel

Present at the meeting were:

U Nyo Nyoit	Mandalay Divisional Trade Manager
U Ba Naw	Manager Pagan Township
U Hla Hnang	Assistant Manager Pagan Township

U Saw Hla Thain **Manager**
Pakokku Township

U Mya Kyaing **Manager**
Mergwe Township

Visit to Government Lacquer-ware Training School

U Aung Myint **Principal**
Government Lacquer-ware Training School

Lecture on marketing for export given by the expert at
the Central Trade Training School

Present at the meeting were:

U San Win **Minister of Trade**

U Han Thein **Director**

U Ba Aye **Executive Committee member**

U Thain Naung **Executive Committee**

U Thi Han **Executive Committee**

U Win Mya **Executive Committee**

U San Lwin **Deputy Director**

U Naung Naung Tun **Deputy Director**

U Than Pe **Deputy Director**

U Thaf Noe **Deputy Director**

U Aung Kyi **Deputy Director**

U Naung Naung **Deputy Director**

U Tun Hla Aung **Assistant Director**

U Hla Saung **Assistant Director**

U Win Kyi **Assistant Director**

Visit to Central Research Organisation

Annex III

CHECK-LIST FOR USERS OF PACKAGING

1. All statistical material available concerning the goods chosen for analysis
 - 1.1 Production (tons or pieces or value)
 - 1.2 Exports (tons or pieces or value)
 - 1.3 Unpacked imports (tons or pieces or value)
 - 1.4 Ideas on how these goods could develop in the future (as far ahead as possible)
 - 1.4.1 Production (tons or pieces or value)
 - 1.4.2 Export (tons or pieces or value)
 - 1.4.3 Unpacked imports (tons or pieces or value)
2. All available papers written on packaging marketing, or techniques or problems concerning packaging
3. Packaging manufacturing factories
 - Name
 - Station
 - Manufacturing programme (as detailed as possible)
 - Output in tons or 1,000 pieces and value
 - Capacity
 - Manpower requirements
 - Planned progresses of capacity
4. Packaging raw materials
 - 4.1 Types of raw materials
 - 4.1.1 Produced in Burma (volume in tons or 1,000 pieces and value in kyats)
 - 4.1.1.1 At present
 - 4.1.1.2 In the future
 - 4.1.2 Imports
 - 4.1.2.1 At present
 - 4.1.2.2 In the future
 - 4.2 Types of packaging media
 - 4.2.1 - 4.2.2.2 - See 4.1

5. Transportation system
 - 5.1 Types of transportation systems
 - 5.2 Relation between transportation system and types of packaging used
 - 5.2.2 During monsoon time
 - 5.2.3 During the rest of the year
 - 5.3 Duration of transportation
 - 5.3.1 Between the users and the packaging factory
 - 5.3.2 Packed goods to the consumers
6. General knowledge of the Burmese climate
7. How does the low standard of packaging media in Burma affect:
 - 7.1 The standard of living in Burma
 - 7.2 Supplying of various areas with consumer goods
 - 7.2.1 Which areas
 - 7.2.2 Which products
 - 7.3 The damage to products
 - 7.3.1 Home market
 - 7.3.1.1 Which main products
 - 7.3.1.2 In which way
 - 7.3.1.3 Relative damage in terms of weight, quantity and value
 - 7.3.2 Exports (see 7.3.1.1 - 7.3.1.3)
8. Costs
 - 8.1 Transportation of packaging media
 - 8.2 Raw materials
 - 8.3 Packages

ANNEX IV

QUESTIONNAIRE FOR PRODUCERS OF PACKAGING

Note: Please give the answers on a separate sheet of paper.

1. Branch (fruits, juices, radios, etc.)

Station

Manufacturing programme

Output in tons or pieces (1,000)

Planned progress of capacity 1975/76-1980

2. Types of packaging media used

2.1 Branch at present Type Cost

2.2 Branch in future Type Cost

3. Distance in miles between packaging manufacturer and consumer goods producers

Branch	Types of packaging media	Miles
--------	--------------------------	-------

4. Is there a relation between the season of the year and the type of packaging media used?

If there is, could you please tell us which relations:

Branch	Season	Type of packaging	Relation
--------	--------	-------------------	----------

5. Did you ever have:

5.1 To stop production? If so, how many times (days) a year?

5.2 To store the product because you have been short of packaging media? If so, which types?

6. Of all types of packaging media, including those unobtainable at present, which type would you prefer to use? Why?

7. Is there any relation between losses or damage to your products and:

7.1 The packaging media used

7.2 The transportation system used

7.3 The season (if there is any relation please tell us for which products which packaging media was used and the percentage of losses)

8. Duration of transportation

- 8.1 Between producers of consumer goods and the packaging factory
- 8.2 Between consumer goods producers and their clients (for example, corporations, shops, consumers)

Annex V

TYPES OF PACKAGING USED IN BURMA

(Packaging used at present for different goods is indicated by an asterisk (*). Paper or paper board packaging that could be used alternatively for these goods is shown by the symbol x.)

No.	Factory or industry	Drum	Gunny	Tin sheets	Paper	Plastic	Wooden	Glass
1	Rice mills		*		x	x		
2	Oil mills	*		*		x		
3	Rice-bran oil mills	*		*		x		x
4	Vegetable oil mills	*		*	x	x	*	*
5	Fish paste	*		*	x	*	*	x
6	Fish meal				x	*	*	
7	Dairy products			x	x	x	*	*
8	Alcohol distillery				x		*	*
9	Biscuits			*	x	*	*	
10	Cigarettes			*	*	x	*	
11	Confectionery			*	*	*	*	
12	Coffee and tea			*	*	*	*	
13	Textiles		*	*	*	*		x
14	Synthetic yarn		x		x	*	*	
15	Tarpaulin		*	x	x	x		
16	Blankets		*		*	x	*	
17	Garments		*				*	
18	Label machine		*		*	x	*	
19	Umbrellas				*	x	*	
20	Soap				*	x	*	
21	Pharmaceuticals			x	*	*	*	*
22	Toiletries			*	*	*	*	*
23	Plastics				*	*	*	
24	Matches				*		*	
25	Toilet paper				*	x	*	
26	Paints		x	*	*	x	*	

No.	Factory or industry	Drum	Gunny	Tin sheets	Paper	Plastic	Wooden	Glass
27	Electrical household appliances				•	x	•	
28	Radio and electrical appliances				•	x	•	
29	Cutlery and razor blades				•	x	•	
30	Dry-cell batteries				•	x	•	
31	Buff and car polish			•	•	x	•	
32	Printing press				•			
33	Wrapping paper				•	x		
34	Noodle and Chinese vermicelli				•	x	•	
35	Canned goods			•	x		•	
36	Brewery and distillery	•		x	x	x	•	•
37	Alcohol distillery (spirits)	•					•	•
38	Pipe tobacco			•	•		•	
39	Salt		•		x	x		x
40	Cottonseed oil	•		•	x	x	•	x
41	Beans and rice flour		•		x	x		
42	Silk		•		•	x	•	
43	Footwear				•	x	•	
44	Cement				•	x		
45	Candles				•		•	
46	Pottery				•		•	
47	Glass		•		•	x	•	
48	Virginia tobacco curing			x	•		•	
49	Cotton ginning		•					

Annex VI

**A STRATEGY FOR THE INTEGRATED DEVELOPMENT OF THE
PACKAGING AND PAPER AND PULP INDUSTRIES**

The analysis of the data gathered on the packaging industry during the UNIDO feasibility study showed that on first estimates, approximately 70 per cent of future requirements for packaging materials could be advantageously covered by paper products. Since the Background Paper for the Revision of the Burma Country Programme 1974-1978 already places emphasis on the development of the paper and dissolving pulp industries, it is considered that a parallel and integrated approach between these industries and the packaging industry would be advantageous.

For the packaging industry, the establishment of a Techno-Economic Development Centre that would provide a focal point for packaging know-how within the country is proposed. This centre would preferably be created as a new division of the Packaging Corporation of the Ministry of Trade and would have the task of advising production units under its own control as well as those of other ministries on various aspects of the industry - technological, economic, standardization, design, training and information. It should not be responsible for production except on a pilot scale.

The facilities and services provided by the centre should be related to the state of industry within the country at any given time, and a three-stage development of the centre over 12 years is envisaged. In the initial stage it would be a comparatively simple facility, but would provide a sound base for progression to a fully developed, sophisticated centre (see appendix 1).

While the centre is being established, a pilot plant should be set up simultaneously for the manufacture of packages from card, board, and corrugated materials suitable for packaging. This unit should also be under the authority of the Packaging Corporation, since the products can then be easily moved, evaluated and controlled for quality and suitability by the proposed centre, all of which would be more difficult if the unit were situated in another ministry.

Estimates show that initially UNDP should provide \$500,000 for the centre and \$400,000 for the pilot plant with corresponding counterpart contributions from the country. The present premises of the Packaging Corporation are large enough for the initial stage of the centre, but they would need improvements to ensure safety and adequate protection of the instrumentation and test equipment that are to be specified. Development through the subsequent stages will involve further expenditure on experts, fellowships and equipment amounting to perhaps \$100,000 in 1978 and \$150,000 in 1980.

This progressive development of the centre is shown in appendix 2. The parallel development of the complementary pulp industry is described below. It will be noted that establishment of appropriate factories and plants is proposed during the period 1978-1982. It is not possible at present to make firm proposals regarding type and size of these plants, since type and size will depend upon the progress made in development by the two industries. It is therefore suggested that progress should be reviewed in 1977 to elaborate a development plan and to decide the amount and source of investment capital that will be necessary.

The parallel development of the pulp industry should remain in the hands of the Central Research Organization. It will consist of a pilot plant for production of pulp with a UNDP input of \$650,000 to supply the existing paper mill, which is being extended but which requires additional but unplanned facilities for the manufacture of some types of paper products needed for packaging. The installation of these facilities would cost approximately \$300,000. The two further pilot plants, one for the manufacture of films and the other for fibres, that are embodied in on-going project BUR/78/007 are other essential components of the multidisciplinary development.

Although the time scale may appear to be rather large in the initial stages, it is believed to be realistic. The complementary development of both industries should permit the maximum economic viability of each to be attained.

The short-term objectives of the centre are to provide assistance in the immediate improvement in packaging of goods for the domestic market and particularly in packaging of exports.

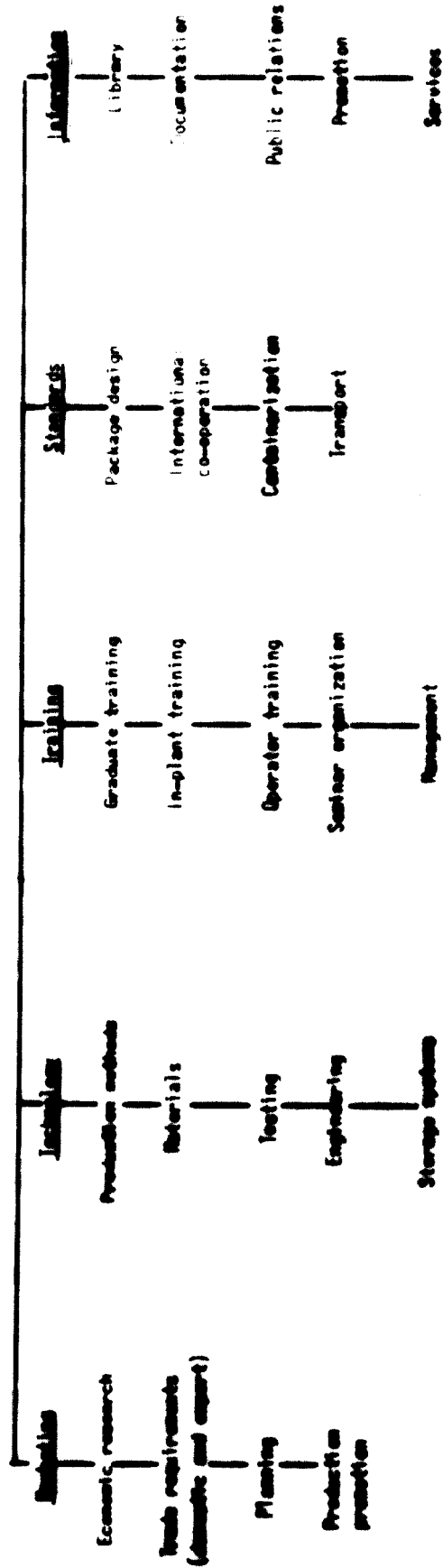
The long-range objectives of the centre are to develop an integrated, strategically planned packaging industry relevant to the amount and future requirements of the Economic Plan of Burma.

Annexure I

Indian Economic Development Centre for Pakistan

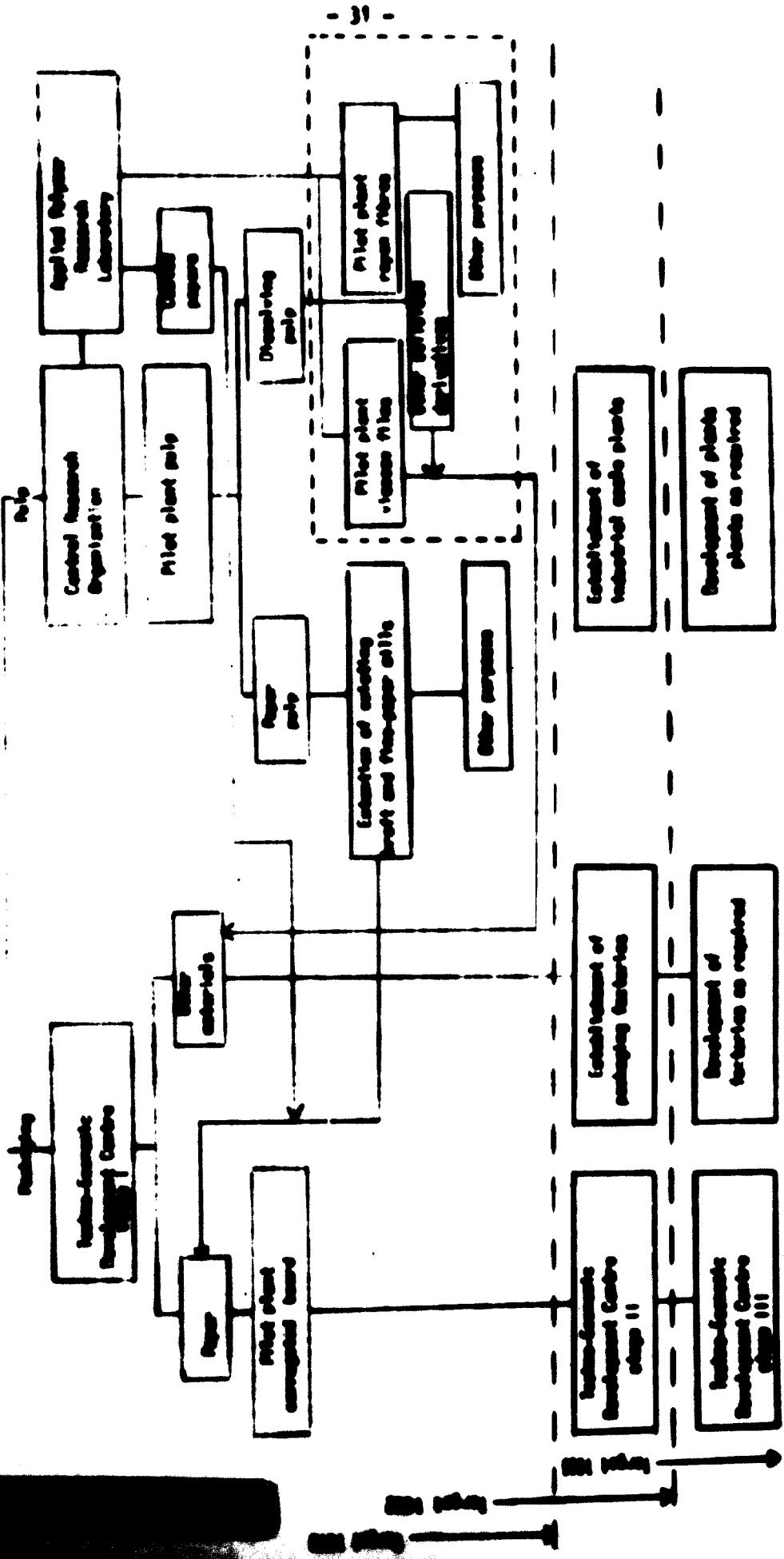
Charges

Department of Administration

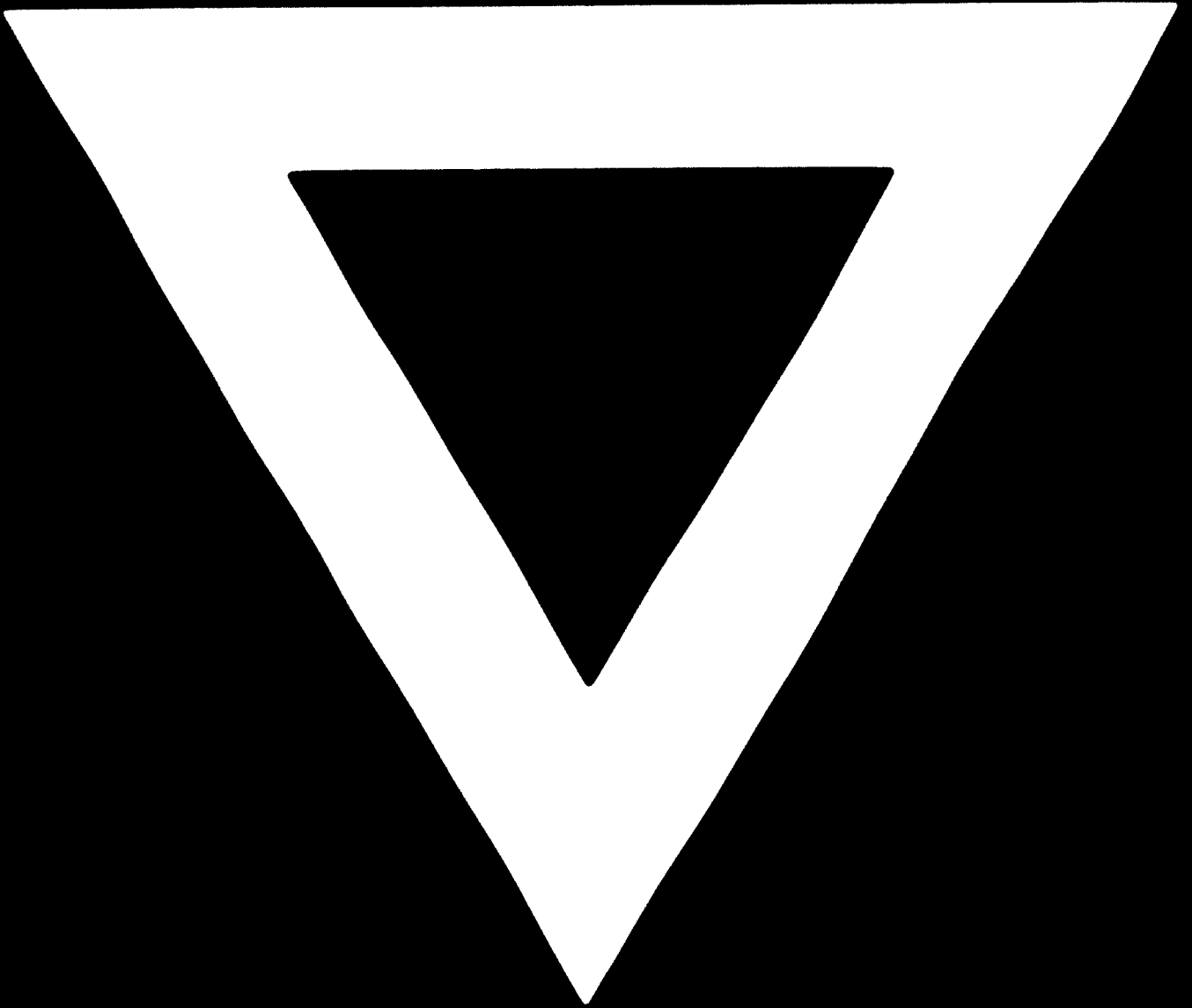


Annex 2

System for Industrial Development of the
Industrial Zone of Job Industries



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