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UNIDO INDUSTRY SECTOR REVIEW MISSION TO MYANMAR

(12 - 29 June 1989)

Report*

prepared by the

Regional and Country Studies Branch
Industrial Policy and Perspectives Division

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I. INTRODUCTION

In the context of its forthcoming mid-term review of the Myanmar country programme UNDP has requested a UNIDO Mission to (a) provide an overall review of the country's industrial sector in terms of its policy and institutional framework, major development constraints and prospects in a medium-term perspective and (b) undertake a thorough review of the industrial sector pipeline projects in the light of the government's new economic policy approach. The Mission was further requested by UNDP to highlight those economic policy issues which are of particular relevance in pursuing the country programme.

This report presents the main findings, observations and recommendations of the UNIDO Mission which took place from 12-29 June 1989. In chapter II a brief outline is given of the overall structure of the country's economy as well as of the turn which the government's economic policy has recently taken. Chapter III provides a closer assessment of the development prospects and constraints of the country's main branches of industry including a look at the available resource basis and the main institutions involved in promoting industrial development. Chapter IV reviews recent economic policy changes in more detail before chapter V discusses the major implications for future technical assistance programming in a medium-term perspective.

Generally it is to be noted that the Mission has taken place at a time characterized by many uncertainties. Specifically, it has not been possible to ascertain in sufficient detail the economic and industrial policies which the country's authorities wish to adopt and pursue in the years to come. The Mission's findings and recommendations thus are based on the assumption that the stated overall objectives of an 'open door' policy, deregulation of the economy and emphasis on private sector encouragement and export promotion will be put into effect by the next Government to be formed after the elections in May 1990.

The Mission team consisted of Habib Khouadja (team leader) and Amanullah Zeweri, Least Developed Countries Branch, and Nils Ramm-Ericson and Wilfried Lütkenhorst, Regional and Country Studies Branch. The members of the Mission wish to express their thanks particularly to Mr. Katsuhide Kitatani, Resident Representative, UNDP, to Col. Aung Koe, Director General, Industrial Planning Department, Ministry of No. 1 Industry and to U Soe Thwin, Director General, Foreign Economic Relations Department, Ministry of Planning and Finance as well as to their staff for organizing and co-ordinating the Mission's work programme. Without their continuous support and co-operation the tasks foreseen could not have been accomplished in such short time, considering the complexity of the exercise.

II. OVERALL ECONOMIC FRAMEWORK

1. Structure of the economy

With a GDP per capita of below \$200 Myanmar belongs to the poorest developing countries in the world. Despite a relatively rich natural resource endowment and a relatively high literacy rate Myanmar has in 1987 been officially accorded the status of a Least Developed Country.

Data on the sectoral composition of GDP for most recent years are provided in Table 1. It shows that according to the provisional figures for 1988/89^{1/} slightly more than 40 per cent of GDP originated from agriculture and another 8.3 per cent from livestock & fishery. Processing & manufacturing activities accounted for 8.9 per cent of GDP, services for 16.0 per cent and trade activities for 22.5 per cent. In a longer-term perspective, looking at the past three decades,^{2/} the following observations on the changing structure of GDP can be made:

- As compared with most other developing countries the structure of GDP has remained remarkably static. No drastic changes have taken place, the most noticeable ones being a 10 per cent decline in the share of trade activities between 1961/62 and 1981/82 and a 3 per cent increase in the share of agriculture in the same period. In the first half of the eighties the structure of GDP has virtually remained unchanged.
- At a very high level of aggregation it can be said that the overall share of commodity producing sectors has slightly increased (from 49 per cent in 1961/62 to 53 per cent in 1985/86) whereas the share of all services and trade activities went down correspondingly.

With regard to industry it can be noted that - despite the fact that the industrial sector has been assigned a priority role in the country's economic transformation - there was no corresponding increase in its GDP share. Due to the sector's dismal average real growth performance (-7.9 per cent in 1986/87; -6.1 per cent in 1987/88),^{3/} the share of processing & manufacturing in GDP declined markedly to a record low of only 8.9 per cent in 1988/89. Hence, at least from a macro perspective, i.e. ignoring changing patterns of production within the sector, it has not been able to play the expected dynamic role as driving force of economic development.

Not surprisingly, when looking at the country's export performance, manufactures have as yet not emerged as a significant element. According to

1/ The fiscal year extends from 1 April - 31 March.

2/ Cf. UNIDO, Industrial Development Review Series: Burma, PPD.65, 16 December 1987, Table 1. (based on current prices).

3/ As compared with a decline of GDP of -1.1 per cent in 1986/87 and -4.2 per cent in 1987/88 (at 1985/86 constant producer's prices).

Table 1. GDP by sector (at 1985/86 constant producers' prices)

Economic sector	Value				Structure				Growth Rate		
	1985/86	1986/87	1987/88 _a /	1988/89 _a /	1985/86	1986/87	1987/88 _a /	1988/89 _a /	1986/87	1987/88 _a /	1988/89 _a /
	Kyat in million				P e r c e n t a g e						
Goods	3430 [^] .6	33977.0	32245.2	32715.9	61.3	61.3	60.8	61.5	(-) 0.9	(-) 5.1	1.5
Agriculture	22243.5	22343.3	20906.8	21365.7	39.7	40.3	39.4	40.2	0.4	(-) 6.4	2.2
Livestock & Fishery	3981.9	4056.8	4212.5	4388.0	7.1	7.3	7.9	8.3	1.9	3.8	4.2
Forestry	757.7	719.6	688.2	797.2	1.4	1.3	1.3	1.5	(-) 5.0	(-) 4.4	15.8
Mining	533.5	498.4	428.6	346.3	1.0	0.9	0.8	0.6	(-) 6.6	(-)14.0	(-)19.2
Processing & Manufacturing	5561.4	5123.3	4810.1	4737.9	9.9	9.3	9.1	8.9	(-) 7.9	(-) 6.1	(-) 1.5
Power	278.0	289.0	300.6	338.6	0.5	0.5	0.6	0.6	4.0	4.0	12.6
Construction	944.6	946.6	898.4	742.2	1.7	1.7	1.7	1.4	0.2	(-) 5.1	(-)17.4
Services	8300.0	8600.0	8869.3	8494.9	14.8	15.5	16.7	16.0	3.6	3.1	(-) 4.2
Transportation	2010.4	2004.1	2039.0	1781.0	3.6	3.6	3.8	3.4	(-) 0.3	1.7	(-)12.7
Communications	207.7	254.8	288.5	285.0	0.3	0.4	0.6	0.5	22.7	13.2	(-) 1.2
Financial Institutions	1332.3	1421.1	1498.6	1602.0	2.4	2.6	2.8	3.0	6.7	5.5	6.9
Social & Administrative Services	2567.8	2659.3	2746.9	2616.2	4.6	4.8	5.2	4.9	3.6	3.3	(-) 4.7
Rentals & other Services	2181.8	2260.7	2296.3	2210.0	3.9	4.1	4.3	4.2	3.6	1.6	(-) 3.8
Trade	13388.7	12819.8	11932.9	11944.8	23.9	23.2	22.5	22.5	(-) 4.2	(-) 6.9	0.1
GDP	55989.3	55396.8	53047.4	53155.6	100.0	100.0	100.0	100.0	(-) 1.1	(-) 4.2	0.2

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.
a/ Provisional.

the Mission's estimates, manufactures account for less than 5 per cent of total export and consist mostly of textile products, leather, cement, some pharmaceutical products (e.g. crude glycerine, alcohol), several petrochemical products and animal feed products. In overall terms, exports account for only a marginal share in GDP (down from 4.7 per cent in 1985/86 to 2.5 per cent in 1987/88) and have experienced a drastic fall in most recent years, partly due to declining prices for major export products.^{1/} As can be seen from Table 2, total exports (in current prices) went down by 5 per cent in 1986/87 and precipitated by 33 per cent in 1987/88 to reach 1.679 million kyat.^{2/} In terms of the commodity composition, forest products (mostly teak) have taken over the first ranking position from agricultural products (mostly rice) the former now accounting for 45 per cent, the latter for 27 per cent of total exports.

Table 2. Export value by type of commodity, 1985/86 - 1987/88
(in million kyat)

Type of commodity	Export value		
	1985/86	1986/87	1987/88 ^{a/}
Exports	2566.1	2418.5	1655.2
Agricultural products	1131.0	800.5	453.5
Animal & marine products	99.8	124.5	76.3
Forest products	1051.0	1084.1	754.3
Minerals & gems	205.9	253.9	225.0
Others	78.4	125.5	146.1
Re-exports	87.8	95.4	24.2
TOTAL	2653.9	2513.9	1679.4

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Throughout the eighties Myanmar has recorded substantial current account deficits which have mostly ranged around 4 per cent of GDP (3.6 per cent in 1987/88). Debt service payments almost doubled between 1982/83 and 1986/87 to reach some 70 per cent of current receipts. In the same period the country's gross international reserves went down from SDR 73 million to SDR 36 million

1/ The terms of trade deteriorated by 44 per cent between 1982/83 and 1986/87.

2/ At constant 1985/86 producer prices exports decreased by 19 per cent in 1987/88.

which was equivalent to less than one month of import requirements.^{1/}

The increasingly precarious foreign exchange situation has led to serious bottlenecks and constraints in the country's economy, especially with regard to essential import requirements of the manufacturing sector. A closer look at the commodity structure of imports shows indeed that they are heavily dominated by industrial input needs. Whereas consumer goods are responsible for only 5 per cent of all recorded imports, the combined share of industrial raw materials & spare parts, construction materials, machinery & equipment and transport equipment amounts to no less than 92 per cent of total imports (see Annex-Table A-1).

Apart from the foreign exchange gap and the concomitant debt service crisis the economy has suffered from the inability of the state to mobilize sufficient domestic capital for investment. Investment expenditures went down by 10 per cent in real terms both in 1987/88 and 1988/89 (provisional figures) which has brought down the investment ratio (share of investment in GDP) to 12.6 per cent. While the key role in promoting economic growth is assigned to the public sector the GDP share of public revenues has decreased continuously to reach a level of slightly below 10 per cent in 1988/89. Given that the manufacturing sector has traditionally been the recipient of the largest allocation of state capital expenditures,^{2/} the negative impact of a decreasing overall capital formation capability on its performance has been significant.

The economic realities outlined above - depletion of foreign exchange resources, lack of crucial production inputs not available domestically; inability to generate sufficient domestic investment capital - culminated in 1988 and prompted the new Government to undertake a wide-ranging revision of the country's economic strategy and policies.

2. New policy approach

The economic policy approach adopted in Myanmar in the early sixties was based on comprehensive central planning and state ownership of all important means of production. Public sector investment was to be the main driving force of economic development. The overall economic strategy was geared towards strictly self-reliant development with priority being assigned to the fulfillment of basic domestic needs within the framework of a virtually closed economy.

Gradual changes occurred during the formulation of the Twenty Year Long Term Plan (1971/72-1990/91) which acknowledged the difficulties encountered in generating the resources required for self-sustained growth within the autarkic strategy pursued in the sixties. Consequently, without however

^{1/} A detailed account of the balance of payments situation is given in :IMF, Burma. Recent Economic Developments, 16 June 1988.

^{2/} For details see Annex-Table A-2. Only in 1988/89 transport & communications was first ranking reflecting the government's priority to improve infrastructural facilities.

allowing significant system changes to take place, the need was recognized to rely to a greater degree on foreign trade and to provide incentives for private economic activities. Notwithstanding some marginal changes, the country's economy continued, however, to be largely sealed off from the world market. During the seventies and eighties - when many other Asian developing countries achieved unprecedented economic growth rates and material progress - Myanmar was persistently falling behind in economic terms. The country's industry - effectively shielded off from international competition - remained at extremely low productivity levels and hence was not only unable to tap export markets and generate foreign exchange earnings but also to cater to the needs of the growing population.

While a policy reform took place already in September 1987 with the abandoning of price controls for rice and other basic commodities, it was only in September 1988 - following a severe economic crisis and widespread political unrest - that dramatic economic policy changes came to be announced. The new State Law and Order Restoration Council (SLORC) has officially discarded the centrally planned approach in favour of a more market-oriented and open economic policy framework. While - as mentioned above - the specific policy changes to be implemented, the degree of the planned 'opening up' of the economy and the precise role to be played by market mechanisms are still unknown, the Government is endeavouring, with a view to promote a rapid transformation from a low-productivity agricultural to a high-productivity agro-based industrial economy:

- to encourage and enlarge the scope for international industrial co-operation, specifically in the form of foreign direct investment;
- to infuse modern technology into the country's industry in order to increase its productivity and competitiveness and to achieve a diversification towards production and export of non-traditional manufactured products;
- to partially deregulate the economy by (a) granting more autonomy to private, co-operative and state enterprises; in areas such as trading activities and entering into joint ventures; (b) privatizing and/or commercializing of state economic enterprises ; and (c) adjusting and increasing the flexibility of the price structure.

The related economic policy measures will be dealt with more specifically in chapter IV of this report.

III. THE INDUSTRIAL SECTOR: PROSPECTS AND CONSTRAINTS

1. The resource basis

Unlike in many other least developed countries a lack of natural resources is not among the major constraints for industrial development in Myanmar. The country is richly endowed with agricultural, fishing, forest, mineral and energy resources which have so far not been fully explored let alone exploited. Below a brief survey is given of the availability of major natural resources which provide the basis for a broad range of industrial processing activities.^{1/}

Agricultural and fishery resources

Agricultural land resources are still substantial in Myanmar. Unlike in some other countries in Southeast Asia, the pressure of population on land has not been very severe and there is still considerable scope for expansion of the cultivated area. The total net cultivated area amounted to 20.3 million acres, and it is estimated that an additional 21.1 million acres represent "cultivable waste land" which could be brought under cultivation. Bringing this potential new land under cultivation, however, is likely to incur high capital outlays (i.e. due to irrigation requirements) and hence no major projects have been launched in recent years to expand acreage under cultivation. Instead, the emphasis has been on making better utilization of existing agricultural land through irrigation, flood protection and reclamation. Currently, only 12.5 per cent of cultivated area is irrigated and about 15 per cent of irrigated land is double cropped.

While irrigation and proper water control are important for double cropping and raising land and labour productivity, the provision of other inputs for crop intensification is more directly related to industry support to agriculture. For example, the success of the Whole Township Programme (WTP) was based largely upon the application of fertilizers and plant protection chemicals. It is also observed that the quickest return to investment in Myanmar's agriculture would be to make more fertilizer available to farmers. Although fertilizer use doubled from about 113,000 tons in 1976/77 to about 227,000 tons in 1988/89, the rate of utilization is still very low. Over 80 per cent of the fertilizer used was applied to paddy; other crops received little.

The agricultural diversification programme into 19 non-paddy crops will besides fertilizers require substantial amounts of other agricultural inputs. Production of these inputs by local industry provides one important way by which the manufacturing sector can make a significant contribution towards agricultural development.

The most recent data on production and export of the country's major agricultural crops are presented in Table 3. The dominant position of paddy production is obvious. In the past decade yields have nearly doubled in the case of paddy and increased even more in the case of other grains and pulses yet they continue to be low by international standards.

^{1/} A more detailed survey is given in UNIDO, Industrial Development Review Series: Burma, PPD.65, 16 December 1987.

Table 3. Production and exports of major crops, 1988/89
(in thousand tons)

Crops	1988/89 ^{a/}	
	Production	Exports
Paddy	13,552.8	198.0
Wheat	229.8	-
Maize ^{b/}	259.3	6.0
Pulses	581.9	18.7
Groundnuts	564.5	-
Sesamum	177.8	0.02
Chillies	37.9	-
Onion	161.2	-
Garlic	40.9	-
Potatoes	116.3	-
Balad jute	25.4	-
Ginned cotton	20.7	0.9
Sugar cane	2,321.7	-
Rubber	14.7	2.1
Burmese tobacco	56.1	-
Virginia tobacco	1.0	-

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

b/ Maize cob and maize sheet.

With regard to fishery resources, Myanmar has the natural advantage of a 1,800 miles long coastal line ideal for developing marine resources as well as the 1,250 miles long river Irrawaddy and many smaller rivers well suited for an inland-water fishing industry.

The industrial processing of these resources thus is an area of great potential; it can serve both as a valuable domestic source of protein and contribute to the generation of export earnings (for recent figures on fish and livestock production see Annex-Table A-3). Catching, storage and processing facilities have in recent years been expanded under foreign assistance arrangements. Most recently, in December 1988, a memorandum of understanding was signed between the Government of Myanmar and companies from Japan, Thailand, Malaysia, Hong Kong, Singapore and the Republic of Korea giving fishing rights to firms from these countries and covering the payment of royalties to Myanmar.

Forestry resources

Forestry resources are substantial with the area under forest covering about 50 per cent of total land area. At present, Myanmar provides about 90 per cent of the world's supply of teak and has about 75 per cent of total

world reserves of this timber. The forests also yield several other hardwoods with good export prospects. As mentioned above, forest-based exports accounted for 45 per cent of the country's total exports in 1987/88.

Aside from earning foreign exchange the forestry sector is an important source of raw materials for the local construction industry to which it supplies about 300,000 tonnes of sawn timber annually. The rural sector is also dependent on the forests for energy needs (in the form of firewood and charcoal) as well as materials for housing construction such as bamboo.

The Myanmar Timber Enterprise, the state enterprise in the forestry sector, has been responsible for extracting all teak logs and half of the total output of other hardwood logs. It operates wood processing industries including all teak sawmills and about 40 per cent of the hardwood mills, and markets wood products both within and outside the country.

Sawmilling of teak is reserved for the Myanmar Timber Enterprise and only custom resawing is permitted for the private sector. The Government has 18 sawmills, and as in the case of rice mills most of them were established before independence. It is estimated that about 60 per cent of their capacity is now over 40 years old. The mills are inefficient and due to outdated technology the recovery rate is low and a high percentage of wood is wasted.

Unlike teak, sawmilling of other hardwoods is not a government monopoly and 60 per cent of the 185 hardwood sawmills in the country are privately owned and operated. They are usually small mills with simple technology and low efficiency. Their output is sold mostly on the local market with only about 5 per cent being exported.

A forestry resource survey is currently underway with FAO assistance and systematic planning for the sector must await the results of the survey. But recent concerns with the annual allowable cut particularly in view of differences in the accessibility of forest areas have intensified efforts to improve extraction and sawmilling operations and to develop downstream activities. Gains that could result from these efforts through better management and a modernization programme seem substantial. For example, log losses during the teak drying period between felling and marketing have been estimated to amount to as much as 10 per cent of production.

Table 4 provides details about recent trends in the extraction, distribution and export of timber. It clearly shows that log exports of both timber and hardwood have greatly increased whereas exports of sawn teakwood have fallen to about one third of their 1985/86 level. A reversal of this trend by way of increased domestic processing of timber should be given high priority in the future. In the present situation of urgent short-term foreign exchange requirements the Government has granted wide-ranging logging concessions to 40 foreign companies (14 from Thailand).

Table 4. Extraction, distribution and export of timber
1985/86 and 1988/89
 (in cubic tons)

	1985/86	1988/89 ^{a/}
<u>Teak (logs)</u>		
Production	358.3	354.0
Distribution	351.5	320.7
- to saw mills	242.8	166.7
- export	104.2	149.0
<u>Hardwood (logs)</u>		
Production	504.3	589.0
Distribution	525.0	507.0
- to saw mills	441.3	228.0
- export	39.4	229.0
<u>Teak (sawn timber)</u>		
Production	96.1	66.7
Distribution	113.5	33.4
- to saw mills	47.8	15.4
- export	65.7	20.0
<u>Hardwood (sawn timber)</u>		
Production	236.1	118.5
Distribution	229.2	118.5
- to saw mills	228.6	118.1
- export	0.6	0.4

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Note: Differences between production and distribution are accounted for by stock adjustments. As regards distribution, local sales are not included in the table.

Mineral and energy resources

The mineral sector was an important source of foreign exchange in the 1940s when it contributed 35 per cent of total export receipts. In the early 1980s its share in exports had fallen to about 8 per cent. Currently, the value added by the sector accounts for less than 1 per cent of GDP and it is estimated to employ 85,000 workers. Petroleum, tin and natural gas are the main products although tungsten, zinc, lead, copper and silver are also produced. The mineral sector has remained depressed and its output at present is about 10 per cent of the pre-war level (for details see Annex-Table A-4).

All official production of minerals is vested in three state mining corporations. These are the No.(1) Mining Enterprise responsible for non-ferrous metals, namely lead, zinc, copper and silver; the No.(2) Mining Enterprise responsible for tin and tungsten; and the No.(3) Mining Enterprise responsible for coal and industrial minerals such as baryte, gypsum, limestone, iron ore, graphite, etc. In addition, the Myanma Gems Enterprise is responsible for the production and marketing of jade, rubies, pearls and other gems. Most of the minerals produced by Nos. (1) and (2) Mining Enterprises are exported while the output of No. (3) Mining Enterprise caters to the local market.

By most accounts the country is considered to have a varied and favourable mineral endowment but large tracts of potentially mineral rich areas have not been geologically surveyed or prospected in detail. Although the Department of Geological Survey and Mineral Exploration of the Ministry of Mines has undertaken some survey work and technical assistance has been provided in this area both by bilateral and multilateral donors, only a small part of the country has been prospected systematically by modern methods.

With regard to petroleum resources crude oil production increased steadily from 6.2 million barrels per year in 1970/71 to reach a peak of 11 million barrels in 1979/80. Since then output has remained between 10 and 11 million barrels until 1985/86 but has drastically decreased since then (to a level of 4.6 million barrels in 1988/89).

The petroleum sector is under the new Ministry of Energy and the responsibility for production and marketing are divided among three corporations. Exploration and production for oil and gas are undertaken by the Myanma Oil and Gas Enterprise. Refining of crude oil and operation of petrochemical and natural gas based industries are the responsibility of the Petroleum Industries Enterprise. The Myanma Petroleum Products Enterprise then undertakes the marketing and distribution of the products.

There are three petroleum refineries in the country. The Syrian refinery located near Rangoon is an old refinery with a capacity of 16,000 b/d which has been expanded to 23,330 b/d with assistance from Japan. Another old refinery with 6,100 b/d capacity is located at Chauk in central Myanmar near the oil fields. The third refinery situated at Mann in central Myanmar was completed recently with a \$140 million loan from Japan and has a capacity of 30,000 b/d. As the peak production of crude oil attained in 1979/80 and again in 1984/85 reached 30,000 b/d, the existing refining capacity is more than adequate to meet the needs of the current production level.

Currently, all crude oil output comes from on-shore wells. Exploration for offshore oil was conducted by four groups of major oil companies on a product-sharing basis in the 1970s but without success. After this, other more promising offshore areas were offered for exploration again on a product-sharing basis, but so far these remain unexplored.

Nevertheless, exploration undertaken with Japan National Oil Company in the Gulf of Martaban has led to the discovery in 1983 of large reserves of natural gas estimated at between 3 to 8 trillion cu.ft. A \$1 billion investment was being envisaged to develop this natural gas field and to establish some downstream industries aimed primarily at the export market. The project has been shelved, however, for financial reasons.

Generally, both foreign and government estimates agree that the country's energy reserves are substantial. Production lags however far behind demand rendering the long-term energy supply situation rather bleak.

2. Structure of the manufacturing sector

Myanmar's manufacturing sector accounts for less than 10 per cent of the country's GDP (8.9 per cent in 1988/89) and employs less than 9 per cent of its labour force. The principal manufacturing activities are related to the processing of natural, mostly agricultural resources and petroleum refining, with food and beverages production generating more than three quarters of gross manufacturing output and about 40 per cent of manufacturing value added. Private industries - though significantly contributing to industrial production - have in the past been confined to small-scale activities; with a heavy emphasis on agro-processing. The internal structure of the manufacturing sector has remained virtually unchanged during the past two decades. Diversification into entirely new areas has not taken place to a significant extent. Since 1982/83 (with the exception of 1984/85) real manufacturing value added declined every year; it fell by -7.8 per cent in 1986/87 and again by -6.1 per cent in 1987/88 as production became increasingly constrained by shortages of fuel and essential imported inputs due to the increasing foreign exchange scarcity.

After the preceding paragraph's summary view of the country's manufacturing sector as a whole a closer look is now taken at its branch composition, ownership patterns and capacity utilization rates.

Table 5 reviews the long term trends in the branch composition of gross manufacturing output. It emerges that the dominant position of food and beverages in total output has further increased in the course of time to reach 77 per cent in 1988/89. The only other industrial branches contributing more than 3 per cent to total output are mineral and petroleum products (5.2 per cent, with a declining trend), industrial raw materials (4.6 per cent) and clothing and wearing apparel (3.6 per cent).

A different picture emerges when looking at the composition of manufacturing value added (see Annex-Table A-5; figures available only up to 1984/85). Again, the structure did not undergo major changes yet the concentration on food and beverages is of course far less pronounced with a contribution of 39 per cent followed by industrial raw materials with 11 per cent and construction materials with 10 per cent.

Table 5. Composition of gross manufacturing output, 1975/76-1988/89
(percentage)
(in current prices)

	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88a	1988/89a/
Food and beverages	69.8	66.7	67.4	68.7	67.4	65.8	65.4	64.7	65.6	70.1	72.0	74.0	76.6	76.8
Clothing and wearing apparel	7.8	9.2	9.6	8.3	8.6	8.7	8.2	8.6	7.5	7.1	6.4	5.1	4.3	3.6
Construction materials	3.2	3.3	3.2	3.3	4.4	4.5	4.2	4.1	4.4	3.5	3.5	3.7	3.2	2.6
Personal goods	3.2	3.5	2.8	2.4	2.2	2.7	3.0	2.8	2.2	1.8	1.8	1.5	1.0	0.9
Household goods	0.3	0.4	0.4	0.4	0.4	0.6	0.6	0.7	0.6	0.6	0.5	0.7	0.6	0.6
Printing and publishing	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	0.8	1.0	0.8	0.8
Industrial raw materials	3.8	4.4	5.2	5.3	5.4	6.1	6.3	6.5	6.7	6.1	5.5	5.3	4.8	4.6
Mineral and petroleum products	6.5	6.8	6.1	5.5	5.4	5.2	5.1	5.7	5.8	4.4	3.9	3.3	3.3	5.2
Agricultural equipment	0.3	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.3	0.3	0.4	0.3	0.3
Machinery and equipment	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.2
Transport vehicles	1.1	1.4	1.6	1.9	1.9	1.8	2.0	2.1	2.2	1.8	2.0	1.9	1.5	1.8
Electrical goods	0.6	0.7	0.5	0.5	0.5	0.7	0.8	0.7	1.0	0.7	0.9	0.8	0.6	0.6
Miscellaneous	2.2	2.1	1.7	2.2	2.3	2.2	2.8	2.5	2.2	2.6	2.3	2.1	2.9	2.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Report to the Pyithu Hluttaw, various issues.

a/ Provisional.

Table 6 and 7 present data on the structure of ownership in the country's industrial sector. As far as the number of establishments is concerned, it can be seen that private factories and establishments account for the overwhelming majority of all industrial units (93.9 per cent) leaving 4.4 per cent for state-owned enterprises and 1.7 per cent for co-operative societies. The share of private establishments is particularly high in light industries producing simple consumer goods whereas state enterprises account for 60 per cent of all units in the case of agricultural equipment and for 70 per cent in the case of machinery & equipment. In general it must be noted, however, that all industrial activity of any significant size is concentrated in state-owned enterprises. Out of a total of almost 40,000 private establishment there are just 13 employing more than 50 workers and not a single co-operative is to be found in this size segment.

The picture is somewhat different when the corresponding shares of industrial production value are measured (see Annex-Table A-7). Here private industries contribute as much as 55 per cent (figure for 1986/87), state-owned industries account for 39 per cent and co-operative societies for another 6 per cent of the total.

Table 6. Ownership structure of industrial establishments by sector, 1988/89^{a/}
(percentage shares)

Sector	Operating factories and establishments		
	State-owned	co-operative	private
Food & beverages	1.8	2.6	96.0
Clothing & wearing apparel	0.7	1.8	97.7
Construction materials	7.3	5.8	85.7
Personal goods	0.3	0.2	99.5
Household goods	1.1	1.5	97.2
Printing & publishing	20.0	5.0	75.0
Industrial raw materials	37.6	0.3	62.0
Mineral & petroleum products	0.7	0.3	99.0
Agricultural equipment	60.0	-	40.0
Machinery & equipment	70.0	-	30.0
Transport vehicles	1.9	3.1	95.0
Workshops & dockyards	100	-	-
Miscellaneous	0.2	0.6	99.2
TOTAL	4.4	1.7	93.9

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Table 7. Ownership structure of industrial establishments by size, 1988/89

Size	State-owned	co-operatives	private	TOTAL
Below 10 workers	981	409	37,965	39,355
10-50 workers	297	308	1,824	2,429
51-100 workers	150	-	9	159
Over 100 workers	426	-	4	430
TOTAL	1,854	717	39,802	42,373

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

The situation with regard to capacity utilization rates has become very bleak. While capacity utilization rates have always tended to be rather low in the past they have now precipitated to levels ranging between 10-30 per cent in various branches (Table 8; figures for state-owned industries only). In 5 out of 8 manufacturing branches covered by Ministry of No. 1 Industry, the utilization of installed capacity has fallen below 30 per cent: this applies to textile industries, pharmaceutical industries, metal industries, general industries and jute industries. This may be partly attributable to factors such as inferior technology and weaknesses in organization and management yet the major determinant has been the acute shortage of foreign exchange to finance essential production-related imports.

Table 8. Capacity utilization rates of state-owned industries by industrial branches, 1985/86 and 1988/89

Industrial branch	1985/86	1988/89
<u>Industries under Ministry of No. 1 Industry</u>		
Myanma Textile Industries	57.1	29.1
Myanma Foodstuff Industries	51.4	48.8 ^{a/}
Myanma Pharmaceutical Industries	65.6	28.3
Myanma Metal Industries	63.0	12.9
Myanma Ceramic Industries	70.2	51.8
Myanma General Industries	65.4	20.5
Myanma Paper & Chemical Industries	57.0	45.6
Myanma Jute Industries	26.5	24.4
<u>Industries under Ministry of No. 2 Industry</u>		
	60.7	48.6 ^{a/}
Average	57.4	34.4

Source: Government data provided to the Mission.

a/ 1987/88.

3. Institutional framework for industrial development

Overall policy responsibilities to direct and promote industrial investment and production in Myanmar is shared between the Ministry of No. 1 Industry (MI 1) and the Ministry of No. 2 Industry (MI 2). The former supervises industrial enterprises basically producing consumer products and other light products. The state economic enterprises (SEE) covered by MI 1 generate about 75 per cent of the total production value under the two ministries of industry. MI 2 accordingly accounts for the remaining 25 per cent which are made up by heavy industries, including machinery and transportation equipment.

Rice milling - a major industrial activity - comes under the Agriculture and Farm Produce Trade Corporation (under the Ministry of Trade). Similarly, wood-processing as another important industrial activity is under the control of the Ministry of Agriculture and Forest. Hence, state enterprises engaged in industrial production are not confined to those under MI 1 and MI 2.

The Ministry of No. 1 Industry has two overall service departments and operates industries in eight different branches of manufacturing (figure 1):

- Industrial Planning Department
- Directorate of Regional Industrial Coordination and Industrial Inspection
- Myanmar Textile Industries
- Myanmar Foodstuff Industries
- Myanmar Pharmaceutical Industries
- Myanmar Metal Industries
- Myanmar Ceramic Industries
- Myanmar General Industries
- Myanmar Paper & Chemical Industries
- Myanmar Jute Industries

The Industrial Planning Department is concerned with all matters pertaining to the planning and implementation of new projects, achievement of production targets, procurement of industrial new materials, capacity utilization, quality improvements and financial management.

The Directorate of Regional Industrial Coordination and Industrial Inspection is in charge of the registration and supervision of private industries, the procurement of imported raw materials to the registered private industries and the technical inspection of all factories under MI 1. In view of the government's new policy to encourage more private industrial investment the functions of the Department are currently being reviewed and will presumably be redefined and expanded.

Details on the factories under the various Myanmar Industries as well as on the major products are provided in figure 1 and Annex-Table A-8. Table 9 provides aggregate data on the number of factories, employment and production value under the various Myanmar Industries. Not surprisingly, textile and foodstuff industries occupy a prominent position accounting between them for 51 per cent of all factories, 51 per cent of total employment and 46 per cent of total production value.

Figure 1. Organizational chart of Ministry of No. 1 Industry

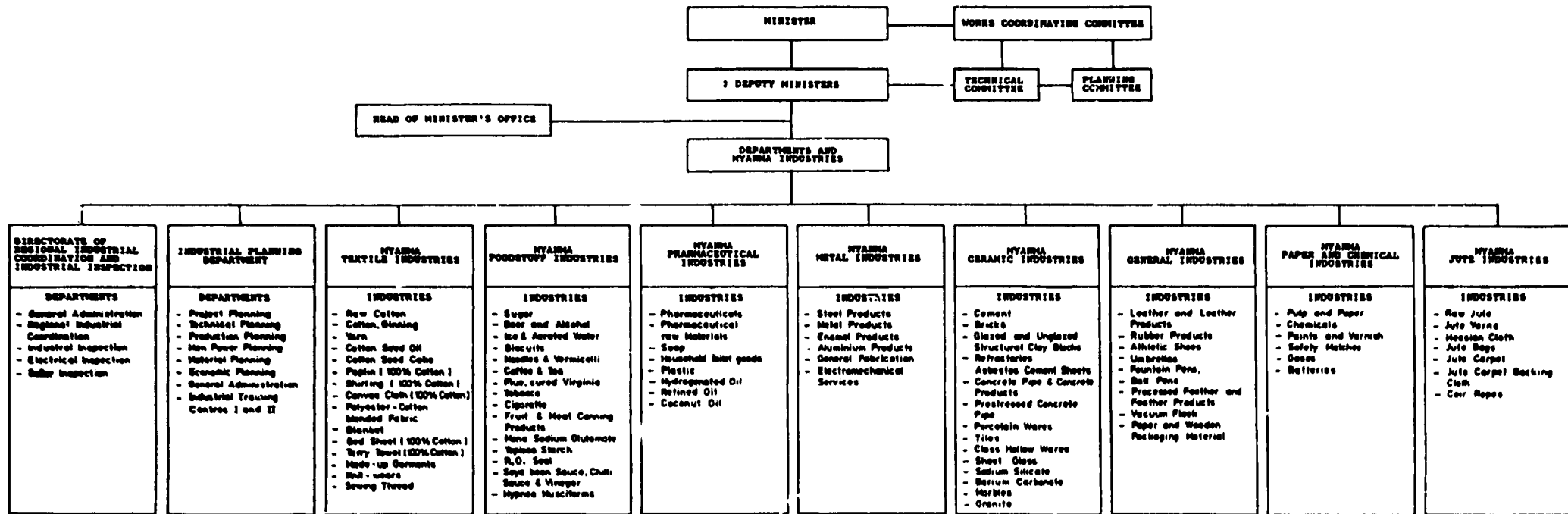


Table 9. Myanmar Industries under MI 1: Number of factories, employment and production value, 1988/89

Industries	No. of factories	Employment	Production value (kyat million)
Myanmar Textile Industries	34	19,813	374
Myanmar Foodstuff Industries	37	9,397	675
Myanmar Pharmaceutical Industries	12	4,410	272
Myanmar Metal Industries	5	2,608	303
Myanmar Ceramic Industries	16	5,945	216
Myanmar General Industries	14	2,438	91
Myanmar & Chemical Industries	9	4,644	167
Myanmar Jute Industries	13	8,222	192
TOTAL	140	57,477	2,290

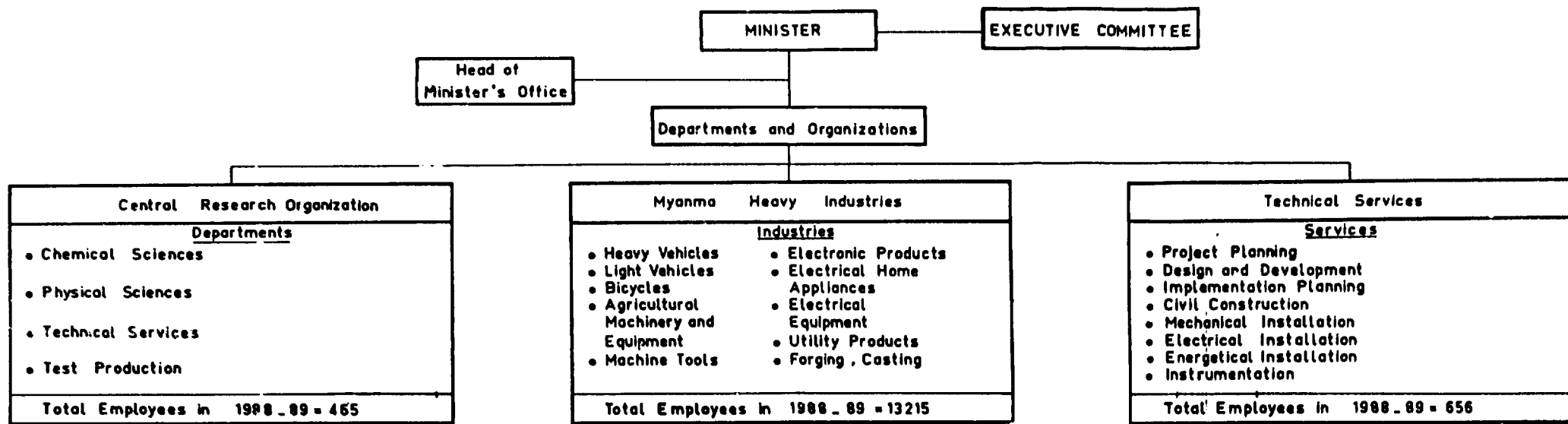
Source: Data provided to the Mission.

The Ministry of No. 2 Industry supervises the country's heavy industries (such as heavy vehicles, agricultural machineries and machine tools) including Myanmar's first joint venture with an overseas partner, the Myanmar Fritz Werner Corporation which produces machine tools and metal fabrication equipment. Employment in these industries stood at 13,215 in 1988/89 which is tantamount to 19 per cent of total employment under MI 1 and MI 2. In addition, MI 2 has two general service department, the Central Research Organization (CRO) and the Technical Services (see figure 2).

The Central Research Organization is the country's only industry-oriented research and development institute. Its main functions are:

- provision of scientific and technological information from national and international sources to industry and concerned government agencies;
- research on appropriate technologies on a laboratory or semi-technical scale;
- trouble-shooting services for problems encountered in various industries;
- establishment of standards and specifications;
- repair and calibration of industrial instruments as well as testing services and general technological advice.

Figure 2. Organizational chart of Ministry of No. 2 Industry



CRO is a multi-disciplinary research organization with 10 technical departments^{1/} and 6 supporting departments^{2/} employing a total technical staff of about 500 people. Emphasis is being placed on developing appropriate industrial processes responding to the needs of the country's various industries. Production processes have already been developed or improved in fields such as battery-grade manganese dioxide, potassium di-chromate, graphite and antimony concentrate, fruit juices, paper products, glues and adhesives etc. Some of the processes involved are presently under pilot operation at the CRO.

The Technical Services provide industrial consultancy services such as project planning, feasibility studies, process engineering and plant design as well as services concerning the transfer of technology of domestic as well as foreign origin.

The banking system in Myanmar is only poorly developed. It consists of the Union of Myanmar Bank which is both the country's Central Bank and a department within the Ministry of Planning and Finance,^{3/} and three specialized banks: the Myanmar Foreign Trade Bank (MFTB), the Myanmar Agricultural Bank (MAB) and the Myanmar Economic Bank (MEB).

The Myanmar Economic Bank is the country's only commercial bank with some 260 branches in all parts of the country. It used to be the primary collector of deposits and the primary lender to state economic enterprises for both working capital and investment expenditures. In the wake of the government's new private sector encouraging policy, MEB is now mandated to undertake lending to co-operative societies and private industries while state enterprises are to meet their financial requirements from the United Consolidated Fund.

A new project promotion section is planned to be established within MEB with staff being trained by the Asian Development Bank. Moreover, the establishment of a new Investment and Commercial Bank is envisaged which would cater for the financial needs of foreign investors and joint ventures.

As regards foreign direct investment, a new Foreign Investment Commission has been set up (composed of concerned ministers) with the functions to review and evaluate all incoming foreign investment applications (see also section IV.2 of this report).

Finally, it should be mentioned that the country's Chamber of Commerce and Industry (originally established in 1919) was rejuvenated in January 1989. Membership is at present rapidly increasing. In June 1989 some 200 members, mainly engaged in trading activities, were registered.

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- 1/ Applied chemistry, atomic energy, ceramics, technology, food technology, metallurgy, pharmaceutical, physics and engineering, pilot plant, polymer technology and pulp and paper technology.
 - 2/ Analytical chemistry, fine mechanics workshop, maintenance and fabrication workshop, standards and specification, technical information, general administration.
 - 3/ MFTB handles all transactions involving foreign exchange.

4. Observations and issues in selected manufacturing branches

In this section only branch-specific issues are discussed. Some important cross-sectoral issues, such as human resource development, export promotion and the role of supporting industries are taken up in chapter V in the framework of new concepts for future technical assistance activities.

Textile industries

The textile industry (including manufacture of garments) is among the most important industrial branches in the country accounting for approximately 10 per cent of total manufacturing value added and providing employment to more than half a million people. Following the nationalization of textile factories in 1968 and 1972, textile production of any significant size is now confined to state enterprises. Some small textile mills are operated by co-operatives; private sector activities concentrate on garment manufacture by handlooms which, however, accounts for some 90 per cent of the country's total production of garments.

Myanmar Textile Industries operates a total of 35 state-owned enterprises comprising, *inter alia*, 12 textile mills, 5 spinning & weaving factories, 2 textile finishing plants and 4 garment factories. Capacity utilization rates (see Table 10) at present are very low (28 per cent on average), in particular in the finishing sub-sector (15 per cent). This is due to a wide range of constraints including in particular lack of proper repair and maintenance; non-availability of necessary spare parts and accessories and erratic supply of raw materials.

Table 10. Myanmar textile industries: capacity utilization rates, 1988/89

Production area	Unit ('000)	Rated capacity	Actual production	Capacity utilization work
Spinning	Lb	25,503	8,452	33.1
Weaving	Yd	52,781	13,606	25.8
Finishing	Yd	58,387	8,765	15.0
Knitting	Yd	5,494	1,292	23.5
Garments	Doz	248	118	47.5
Miscellaneous (1)	Yd	16,468	5,330	32.4
Miscellaneous (2)	Nos	26,961	9,528	35.3
Cotton	Bales	110	23	20.9
TOTAL	Kg	1,347,520.8	373,795	27.7

Source: Data provided to the Mission.

A new textile finishing plant is under construction with World Bank assistance and is to be completed by the end of 1989. It will have a printing

and dying capacity of 17 million yards and is intended to be partly used for export production. At present, the country's total textile exports reach 9.3 million kyat (1988/89) of which almost 90 per cent are accounted for by garments exports alone. It is to be noted, however, that this figure reflects net exports, i.e. on a CMP basis as explained below.

The garments exports largely originate from co-operation with foreign partners under the so-called Mutually Beneficial Economic Cooperation Scheme. Four export-oriented garment factories have been established with partners from Singapore, the Republic of Korea and Hong Kong (2 factories).^{1/} They are operated either on a buy-back basis or on a consignment basis.

- In the case of a buy back arrangement the foreign company brings in the required machinery, components and raw materials whereas Myanma Textile Industries provide the land, buildings and labour force. Once production has started, the foreign partner pays so-called CMP charges (cut, make & pack) out of which he receives payment for the cost of machinery (normally over a repayment period of 2-3 years).
- In the case of a consignment arrangement the foreign partner provides the required raw materials to already existing factories and pays so-called stitching charges for processing activities.

Many of the country's textile factories are seriously hampered in their operations by a lack of essential spare parts which, due to the foreign exchange shortage, cannot be imported in sufficient quantities. A potential appears to exist to produce some of the required spare parts domestically, including certain types of wooden shuttles. Technical assistance would, however, be needed to build up efficient domestic production capabilities in this field.^{2/}

Food industries

Food (including beverages) industries are the dominant industrial branch in Myanmar accounting for approximately three quarters of gross manufacturing output and approximately two fifths of manufacturing value added. It was also emphasized above that this branch is clearly a domain of private and co-operative producers which together provide approximately three quarters of the country's food products. With the most important state activity in the food branch, viz. rice milling, coming under the Ministry of Trade it is further to be observed that the food production under Myanma Foodstuff Industries accounts for less than 3 per cent of total production in this branch (plantation white sugar being by far the most important single item).

Some products of Myanma Foodstuff Industries are being exported in minor quantities, including sugar, coffee seeds, black tea and tobacco. In general, however, food exports are seriously constrained by a lack of price

^{1/} In addition one export-oriented knitting factory was established in co-operation with a company from Japan. A major motive for this co-operation is the unutilized quota of the country under the Multi-Fibre Agreement.

^{2/} See section V.2. of this report for further details.

competitiveness (largely due to the overvalued exchange rate; see section V.1.) as well as by the high costs of packaging. While higher prices can be fetched on world markets for canned products (e.g. fruit and vegetables), tin cans so far need to be completely imported at very high prices. (The issue of packaging is discussed in more detail in section V.2.)

Although rice milling assumes major importance among the country's food industries, inadequate storage facilities and poor milling standards have reduced the quality of rice so that it sells at a price on the world market which is 20 to 25 per cent below other major exporters such as Thailand. Low quality further restricts markets to poor neighbouring countries and to African consumers. Currently, neighbouring countries are becoming more self-sufficient in rice and most African countries are facing financial difficulties and are reducing imports. These facts point to the need to increase the competitive strength in the quality market for rice through reorienting production and procurement prices towards varieties that are attractive on the world market as well as improving quality standards through better storage, milling and handling practices. Increasing storage capacity and updating milling machinery and equipment have received much emphasis in recent years. Thus, IDA and ADB have granted loans amounting to \$23 million and \$16 million, respectively, to build new permanent storage facilities, rehabilitate old facilities, provide better pest control and improve handling and transport services. Similarly, ADB has been active in the rice milling area and has extended a credit of \$17 million to establish new facilities and to renovate old mills. Twenty medium-sized mills of 6 tonnes per hour capacity are reported to be under construction of which several have already been completed.

Myanmar's rice milling capacity is estimated at about 2,000 tonnes per hour. Of this, the Myanma Agricultural Produce Trading (MAPT) owns only 5 per cent and reliance has to be placed on contractual arrangements with private millers to process government procured paddy. Eighty-five per cent of available milling capacity is estimated to consist of mills that depend on husk-fired steam boilers with half of them over 50 years old. Consequently, there is growing concern with regard to the lack of renovation and maintenance of these old mills. Under present circumstances the private sector is not in a position to redress the situation. It represents one area in acute need of government assistance and support. Of the 900 mills contracted by AFPTC, tentatively 180 mills have been identified as possible candidates for rehabilitation. It appears that in the absence of rehabilitation millers would lack the technical capacity and incentives to mill paddy at higher grades.

Metalworking industries

The country's metalworking industries are almost exclusively operated by the state, apart from minor small-scale activities undertaken in some private and co-operative establishments.^{1/} They are covered both by MI 1 and MI 2 as explained below.

^{1/} As for example in the case of the Sein Ban Industrial Cooperative in Mandalay which was formed in 1983 by some 60 individually owned cottage-type workshops. The Cooperative owns one central workshop. It produces spare part for army trucks, machinery parts for coal mining as well as expellers for old oil mills of which approximately 1,000 exist in the Mandalay Division. Orders are received both from government departments and from private customers.

Myanma Metal Industries (under MI 1) runs one steel mill, one works & maintenance factory, one aluminium ware factory, two enamel ware factories and one metal scrapping factory with total employment amounting to some 4,000 persons. The metal scrapping factory has a capacity of 17,000 tons of scrap (mainly from ship breaking) per year. In 1988/89 the factory generated export earnings of 1.2 million kyat by exporting 10,000 tons of scrap to Singapore and Malaysia. Capacity utilization of all factories under Myanma Metal Industries has decreased drastically from 63 per cent (1985/86) to 13 per cent (1988/89), again due to a lack of essential spare parts and raw materials.

Under Myanma Metal Industries, there is also one woodworking plant (established in 1972 with an ADB loan, as unit of the works and maintenance factory) producing teak parquet, door and window frames and some other wood-based products for both the local and foreign markets. A further joint venture with NC Woodwork from Singapore is currently being established in the same field under the name of Myanma CNC Woodwork Company. Production of this joint venture is mostly planned to be exported to Singapore.

As indicated above, heavy metalworking industries are covered by MI 2, including, inter alia, heavy vehicles, agricultural machinery, machine tools, forging, casting and electrical equipment. Various technical cooperation agreements were concluded with foreign partners from Japan (agricultural irrigation pumps and other equipment), CSSR (50 hp tractors, PVC wire) and FRG (machine tools).

MI 2 further operates an Industrial Training Center (financed under FRG assistance) which offers 3 year courses for 130 trainees per year in eight different mechanical and electrical trades. A further Industrial Training Center (under MI 1) was opened in January 1986 (again under FRG assistance) in Syriam. In the first stage it offers courses for maintenance fitters and maintenance electricians; it is planned to include in a second stage also courses for chemical industries workers. The Center is equipped with modern machinery including the only CNC metalworking machine available in the country. It is used for producing moulds for the glass bottling factory and for plastic factories. Furthermore, the Metallurgical Research and Development Center, established with Japanese assistance under the Ministry of Mines, provides assistance to metalworking SEE, e.g. in the form of information on developing new processes.

In general, the range and the structure of the country's metalworking industries are in urgent need of being reviewed and rationalized. At present, there are no links between MI 1 industries and MI 2 industries in this branch nor does a local parts and components supplying industry exist which could be built up by drawing upon skills and resources available in the private and co-operative sectors. Consequently, the industry is crucially import-dependent and, given the prevailing foreign exchange shortage, production levels required to meet only the most essential domestic demand cannot be maintained.

Non-metallic minerals

Myanmar possesses a number of non-metallic mineral resources which are industrially processed at a larger scale in 16 factories under Myanma Ceramic Industries. Total production value in these factories reached 216 million kyat in 1988/89 (down from 345 million kyat in 1986/87) of which nearly 50 per cent were accounted for by cement production in the country's three cement mills. Further products include bricks, asbestos, concrete, concrete pipes, pottery products, glass, sheet glass and marble.

Cement and sheet glass have recently become export items with the export value amounting to 15.3 million kyat and 0.7 million kyat, respectively. However, sheet glass was exported below production cost (if based on the official exchange rate). Marble exports have so far been negligible but there are plans to establish an export-oriented marble finishing joint venture near Yangon with a Japanese partner on a buy-back basis.

Most production processes in this branch being highly energy-intensive, the impact of fuel and electricity shortages has been felt most severely. For example, in the sheet glass factory, capacity utilization dropped from 68 per cent in 1987/88 to 28 per cent in 1988/89 and most recently production had to be stopped altogether due to the non-availability of fuel.

Accordingly, the Government is at present according high priority to energy-saving programmes at the plant level including attempts to increase the efficiency of energy utilization as well as the conversion from oil to gas as energy source. Technical assistance is required to support related programmes (see project No. 1 under V.3.).

General industries

Myanma General Industries has 13 factories under its management, predominantly based on the industrial processing of rubber and leather. Production in these factories comprises rubber goods such as rubber footwear, canvas and jogging shoes, rubber balls, moulded rubber spare parts and latex foam; leather tanneries producing chrome leather, semi-finished leather and vegetable tanned leather; leather goods such as industrial gloves, leather apparel, leather spare parts for textile and weaving factories; wooden containers and corrugated card boards; duck feather goods; thermos flasks; and fountain pens.

A small percentage of production (approximately 3 per cent) is exported, predominantly hides and skins (accounting for over 90 per cent of these exports) plus minor quantities of industrial gloves and duck feather goods. Some of these exports take place in the framework of countertrade arrangements.

In 1989, a new production line was set up for the manufacturing of athletic shoes under a technical co-operation agreement with a company of the Republic of Korea. The Korean partner has supplied the equipment and raw materials,^{1/} provides training to the workers (partly in the Republic of Korea) and is responsible for quality control. Production increased within two months from 400 to 800 pairs/day the final target being 1,000 pairs/day. CMP charges amount at present to \$1.2 per pair which is said to be below cost. It is planned to expand production further to canvas shoes for the domestic market.

As regards leather industries, there appears to be high interest from foreign investors to engage in joint venture activities. One tannery joint venture is under negotiation with a Thai partner which is to produce initially wet blue leather and is to diversify into various leather goods at a later stage.

^{1/} At a later stage the utilization of domestic rubber is envisaged.

Jute industries

Myanma Jute Industries operate 13 factories consisting of 9 jute baling presses, 2 jute mills, 1 coir rope factory and 1 carpet products factory. The jute mills produce jute bags which are largely used for rice exports. Annual requirements amount to approximately 60 million jute bags whereas only 42 million can be supplied by the jute mills which achieved an average capacity utilization rate of below 40 per cent in 1988/89. The declining trend of capacity utilization was caused on the one hand by a severe shortage of spare parts, dyes and chemicals (which has also negatively affected jute carpet products) and on the other hand by a shortage of jute cuttings. Jute cuttings at present account for only 15 per cent of all jute supplies (85 per cent is in the form of long jute) while the machinery in the two jute mills, at Okkyin and Myaung Mya, was designed to use 41 per cent and 57 per cent jute cuttings, respectively.

An overall shortage of raw jute is also to be noted recently whereas there was a supply surplus up to two years ago. Since then, rice and sesamon growing has become more attractive and the raw jute purchasing prices would need to be increased significantly if production were to be stimulated for import-substitution reasons.

IV. OVERVIEW OF RECENT ECONOMIC POLICY CHANGES

As briefly outlined in section II.2. of this report, Myanmar is at present in the early stage of a transitional process away from the autarkic socialist development pattern of the past towards a strategy which puts more emphasis on market mechanisms and openness to the world economy in terms of trade and investment activities. The statements by the Government regarding the adoption of a market economy approach have not so far been implemented through far-reaching policy measures. Yet some important steps have recently been taken in various fields, particularly regarding foreign trade and foreign investment policies.

1. General measures

The present Government has officially abolished all existing long-term economic plans in favour of short-term economic planning on the basis of annual plans. This is done, however, without any clear coherent notion of both the macro policies and the industrial priorities required in the future.

As regards development projects in the industrial sector, preference is accorded to the completion of ongoing projects which are resource-based and foreign exchange generating or saving. New projects are mainly sought in the form of export-oriented foreign investment utilizing local labour and raw materials.

In March 1989 the State Law and Order Restoration Council (SLORC) officially revoked the 1965 Law for the Establishment of a Socialist Economic System. At the same time, a new law was enacted which abolishes state monopolies in many industrial branches and allows co-operatives and private entrepreneurs (both domestic and foreign) to engage in production and trade of most industrial goods. Important areas which continue to be reserved for state economic enterprises are teak, petroleum, natural gas and precious stones. These activities can be conducted either by a wholly government owned enterprise or as a joint venture with domestic or foreign partners.^{1/}

^{1/} More specifically, the following activities have been listed in the new law as state monopolies: extraction of teak and sale of the same in the country and abroad; cultivation and conservation of forest plantations with the exception of village owned firewood plantations cultivated by villagers for their personal use; exploration, extraction and sale of petroleum and natural gas and processing of their products; exploration, extraction and export of pearls, jade and precious stones; breeding and production of fish and prawns in fisheries which have been reserved for research by the Government; postal and telecommunications services; air and railway transport; banking and insurance; radio and television broadcasting; exploration, extraction and export of metals; electricity generating services other than those permitted by law to private and co-operative electricity generating services; manufacture of products relating to security and defence which the Government has, from time to time, prescribed by notification.

While there is a new Foreign Investment Law (see section IV.2.), it is to be noted in this context that at present no private enterprise law is in force for domestic investment. The old law has been abolished in view of its regulatory and restrictive approach, a new law is said to be prepared at present. Measures have been taken, however, under government order to lower income and profit taxes for private industries. While incomes up to kyat 15,000 will not incur any tax during the current fiscal year, private income tax has been reduced from 25 to 20 per cent, foreign company tax from 40 to 30 per cent and profit taxes for domestic firms from 50 to 30 per cent.

The Mission was further given to understand that the Government intends to provide access to many public sector support institutions also for co-operatives and private industries which have so far been excluded from their services. This would in particular apply to the Central Research Organization (CRO) and to the existing Industrial Training Centers. Such a measure could provide important development stimuli to the country's industrial sector as a whole (see also section V.2.).

It has not been possible for the Mission to obtain information in sufficient detail on the government's approach with regard to the future role of state economic enterprises (SEE) in the industrial sector. In general, privatization of SEE is being discussed, inter alia, by returning some nationalized companies into private hands. Furthermore, SEE would be required to adopt a commercial business orientation and to generate profits. The implications of this demand for loss-generating SEE have not been spelled out so far, however. An important change has occurred insofar as SEE are now allowed to enter into technical co-operation agreements and joint ventures with any other company be it a private domestic firm or a foreign firm. This may be seen as an important avenue to expose some SEE to a commercial spirit in the future. Indeed, following the long period of inefficient operations under monopolistic conditions, the gradual commercialization of SEE activities may be more appropriate than their immediate privatization. Management contracts with competent foreign partners may be seen as one possible approach in this respect.

2. Foreign investment

The Foreign Investment Law which became effective 30 November 1988 is certainly among the most important policy measures taken by the present Government. The Law allows foreign investors to establish either wholly foreign-owned enterprises or joint ventures in which the foreign partner would be required to take at least a 35 per cent equity stake. All foreign investment applications have to be approved by the new Foreign Investment Commission appointed by the Government which is to review the proposed projects in terms of their economic justification and financial viability. The Foreign Investment Commission has been empowered to grant wide-ranging investment incentives, including in particular:

- a tax holiday for three years after start-up of operations plus a possible extension;
- profit tax exemptions for funds reinvested within one year;
- accelerated depreciation allowances on equipment and buildings;

- tax breaks on export income;
- permission for employers to pay expatriates' personal incomes taxes and count them as an operating cost;
- equal personal income tax rates for non-residents and locals;
- deductions for research and development;
- the ability to carry forward losses for three years when sustained during the first two years after the tax holiday; and
- customs duty exemptions on machines and materials imported during the construction period.

Furthermore, there are guarantees against nationalization and for the repatriation of profits. The law accords priority to investment projects which promote exports, exploit domestic natural resources, transfer high technology, increase employment, save energy or contribute to economic development in the provinces.

The first industrial joint venture established under the new Law is in the field of woodworking with a partner from Singapore (see also section III.4. of this report). This may be seen as indicative of an overall high interest from regional investors in Myanmar as new production location.

Further joint ventures under the new Law are being established at present in the framework of activities undertaken by the Union of Myanmar Joint Venture Corporation No. 1 (JVC 1). JVC 1 was recently formed as a limited company with 50 per cent of equity being held by private shareholders and 50 per cent by the State Trading Corporation.^{1/} JVC 1 hence is a mixed company without foreign participation. JVC 1 in turn is partner in three further joint ventures which are being formed under the new Law as private limited companies (the letters of intent have already been signed). The ownership structure of these three joint ventures with foreign participation is as follows: 30 per cent JVC 1; 40 per cent foreign investor(s); and 30 per cent concerned state organizations. More specifically, the following three joint ventures are being established:

- Myanma Agro-Aquatic Resources Development Ltd.
 - equity distribution: 30 per cent JVC 1
 - 40 per cent foreign partner(s)
 - 30 per cent Myanmar Fisheries Enterprise
- Myanma Rubber Wood Industries Ltd.
 - equity distribution: 30 per cent JVC 1
 - 40 per cent foreign partner(s)
 - 30 per cent Myanmar Agricultural Service

^{1/} Total equity shares of JVC 1 amount to kyat 50 million divided into 50,000 shares of kyat 1,000 each.

- Myanmar Bamboo Industries Ltd.
 - equity distribution: 30 per cent JVC I
 - 40 per cent foreign partner(s)
 - 30 per cent General Merchandise Trading

3. Trade Policy

As mentioned above, trade activities have been substantially liberalized with a view to open the country's economy to the world market. Both co-operatives and private entrepreneurs are now allowed to engage in all domestic and external trading activities with the exception of trade relating to teak, petroleum, natural gas and precious stones.

A significant departure from previous policies is to be seen particularly in the so-called 'border trade'. Following negotiations held and arrangements made in November 1988 official border trade has been initiated with China with three trading points opened in Mankham, Muse and Kyohkok. The intention has apparently been to reduce cross border smuggling which in the past has fueled a substantial black market. The volume of border trade is estimated at approximately \$300 million annually comprising mainly exports of agricultural products (such as cotton, dried fish, prawns, fish skins and duck feathers) in exchange for Chinese consumer goods (such as cosmetics, bicycles and household articles). The border trade arrangements immediately triggered off thriving trading activities as the transactions (including customs duties to be paid to the Government) are based on a flexible spot market exchange rate rather than on the overvalued official rate (on the exchange rate issue in general see also section V.1. of this report).

In general, according to Department of Trade data, there are now approximately 200 registered exporters and approximately 100 registered importers, the majority of them undertaking trade in agricultural products.

Wide-ranging changes have furthermore been undertaken with regard to the allocation of foreign exchange. Exporting state economic enterprises now can claim a portion of their foreign exchange earnings to finance essential imports; the exact amount varies, however, subject to the nature of exports and related import requirements. Private exporters have been allowed to retain 60 per cent of their foreign exchange earnings to finance imports of any kind.

V. IMPLICATIONS AND FOCAL AREAS FOR TECHNICAL ASSISTANCE PROGRAMMING

1. General observations and issues

At present, the industrial sector - as indeed the whole economy - of the country is at a crossroads. Assuming the proper implementation of the new market-oriented, private sector-encouraging development strategy, it may be possible to mobilize more effectively the country's human resources and efficiently utilize its rich endowment with natural resources for industrial development. It is important to reiterate that Myanmar's economic development has in the past been constrained mainly by the country's isolation from the world economy and the rigid central planning system rather than e.g. by lacking resources or the smallness of its domestic market, as is the case in many other Least Developed Countries. Conversely, there is every reason to believe that the adoption of a conducive development strategy will provide a powerful impulse to push the country's industry towards higher levels of productivity and competitiveness.

However, to initiate and carry through such a drastic turn in a country's economic strategy is a formidable task requiring wide-ranging changes in policies, institutions, technology acquisition and development, company organization and management, the legal framework and traditional attitudes and modes of behavior.

Every effort should be made to gear the industrial technical assistance programme in the years to come towards providing advice and crucial inputs to this transition process and to minimize the adjustment costs involved. In the following section some of the most urgent requirements in this regard are outlined and translated into new project concepts which in the Mission's view respond to the immediate key assistance needs in the industrial sector. Before specifying these concepts, it is appropriate, however, to briefly discuss some more general economic issues which are relevant in this context.

The success or failure of the initiated transformation process is clearly determined as much by micro-level policy measures (aimed at particular branches, markets, technologies, etc.) as it is by the overall macro-economic conditions prevailing in the country. In particular, the Mission wishes to emphasize that the issue of a more market-oriented, realistic exchange rate assumes crucial importance in this regard. At present, the country is unable to exploit the comparative advantages existing in a number of resource-based industrial branches due to the negative across-the board impact of a grossly overvalued currency. There is a danger that - unless corrective action is taken in the initial stage of the new economic strategy - even well-designed export promotion programmes may be bound to fail. Moreover, an overvalued exchange rate has the general effect of discouraging foreign capital inflows, notably foreign direct investment which, however, will need to play a key role in providing the technology and marketing skills required to stimulate export-oriented production.

In addition to the exchange rate issue it is suggested that priority attention be given to the following industrial policy areas.

While the new emphasis on attracting foreign investment is a significant change, it appears important not to neglect the essential role of domestic investment in fulfilling the basic needs and increasing the supply of consumer goods for the population. In this context, the promulgation of a new domestic investment act should be given high priority. At present, with the existence of a liberal Foreign Investment Law, domestic investment has been put at a competitive disadvantage in terms of the eligibility for fiscal and financial incentives. The establishment of an investment climate of confidence and security is seen by the Mission as a key precondition to boost private domestic investment. In this context, the whole system of taxation for private, co-operative and state enterprises as well as the regulations governing foreign exchange allocations need to be reviewed with a view to eliminate existing distortions. Furthermore, the need to provide investment finance is to be emphasized. Industrial expansion will imply a new and increasing role for the banking system in servicing enterprises. Short-term and, more so, medium- and long-term credits must be assigned an active developmental role which implies both responsibility and risk-taking, and thus involvement in investment decisions, for the banking sector.

A more active role of the banking sector is but one of the preconditions for an effective encouragement of private industries. Furthermore, it would be essential to improve the private sector's access to skilled labour, e.g. by opening up existing training institutions (which so far have been exclusively linked to state companies' needs) and establishing further vocational training centers. Given that the existing private industries in the country are almost exclusively of a small-scale nature and have not been exposed to a commercial environment in the past, a broad range of support measures would be required to improve their performance. This would encompass the provision of finance, technological upgradation services, the enhancement of managerial capabilities (including basic issues such as accounting techniques) and efforts to more effectively utilize the potential of small and medium private industries as suppliers of inputs to large state enterprises. In this context, the establishment of a specialized center for small-scale industry promotion may be considered. As regards privatization of state economic enterprises, potential appears to exist particularly in the manufacture of garments and shoes, the processing of agricultural products (fruits, vegetables) and in wood-processing, including furniture-making. In some of these areas (such as in shoe and garment manufacturing) export oriented production with foreign partners (e.g. from the Republic of Korea) is already taking place and could provide a good opportunity for domestic private entrepreneurs to be exposed to international market conditions.

In terms of sectoral priorities, the Mission notes the government's objective to pursue a resource-based industrialization strategy aimed at increasing the domestic value-added derived from the processing of natural resources in agriculture, fisheries, forestry and mining. It is in these areas where also the greatest export potential can be assumed to exist in the short to medium run. At the same time, a thorough re-assessment is needed of the role of the metalworking and engineering industries in Myanmar's industrial transformation. In-depth analyses will be required to ascertain which metalworking and engineering industries can be economically justified (in terms of economies of scale, technological requirements, import dependence, etc.) in the context of both the country's resource endowment and international market conditions. For these engineering branches to be built up in the country, some degree of temporary infant industry protection may be

required. On prima facie grounds, a case can be made to locally produce agricultural processing equipment (e.g. for rice milling and edible oil processing) and less sophisticated woodworking machinery for which domestic demand is relatively high and can be expected to increase.

Another important area is the need for better structural integration of the industrial sector. The Mission has noted that hitherto public and private industries, large-scale and small-scale industries, urban and rural industries have been operating without substantial linkages. If industrial production is to gain momentum and, above all, if productivity is to be increased, then more specialization and complementarities need to be established. Specifically, sub-contracting potentials will need to be explored and promoted within an overall strategy of building up small- and medium-scale supporting industries which can efficiently produce industrial parts and components for larger enterprises. In this context, the Mission feels that the role of industrial co-operative societies deserves special attention.

2. Project concepts for future technical assistance activities

a. Industrial strategy and policy formulation

The economy of Myanmar in general, and the industrial sector in particular are at a major turning point in their development. The country's authorities have adopted a radically new economic strategy in principle. A new Foreign Investment Law has been put into effect, some deregulation measures have been implemented yet the more specific industrial policies to be pursued in the future have not so far been laid down.

The Mission sees an urgent and immediate need to provide support in industrial policy formulation. It is crucial at this stage to perceive the future industrial development of the country in a long-term perspective and, above all, against the background of relevant trends in the international economic system. This would essentially involve issues such as trade flows, determinants of foreign investment, corporate strategies in various branches, development of new technologies, marketing channels, industrial strategies and policies of other developing countries, forms of regional and international co-operation, etc.

It is suggested to organize a high-level industrial strategy seminar in Myanmar in which international experts and UNIDO staff would present information on and analysis of relevant international trends for discussion with senior officials (and possibly representatives from other multilateral/bilateral agencies). The seminar's immediate objective would be to outline the broad scope, options and potential modalities for the development of Myanmar's manufacturing industry in the medium- and long-term perspective. An in-depth study to be prepared in the wake of such a national seminar would serve as a first step in initiating a programme of regular industrial policy dialogues, economic analyses, in-depth sub-sector studies, information exchange and assistance in the field of industry.

b. Promotion of foreign and domestic investment

(i) Establishment of an investment promotion agency

It appears most essential that an institution in charge of promoting industrial investment in Myanmar - in the form of both foreign and domestic investment - be established at the earliest possible time. Such an agency would be in charge of all investment-related issues including in particular the promotion, approval, coordination, monitoring and appraisal of investment. The agency's promotional activities would encompass the granting of investment incentives based on clear criteria for priority forms and areas of investment (e.g. technology transfer, employment generation, export orientation, regional development contribution, etc.), assistance to foreign investors in all administrative matters both in the pre-investment and in the operational stage as well as the provision of a wide range of supporting services, such as information services or assistance in obtaining industrial labour meeting the investor's skill requirements.

It is understood that the building-up of such an investment promotion agency is a long-term institution-building effort involving substantial human and financial resources. It will thus need to be considered and planned in a number of stages. The Mission feels, however, that the availability of some core investment promotion activities under a specially designated agency is of immediate importance. In this regard, it appears appropriate to draw upon the experience gained and expertise available in a number of developing countries in the region.

Furthermore, UNIDO would be ready to provide assistance in strengthening the professional capability of the proposed agency. This assistance would be mainly in the form of expertise to define the organizational structure of the agency, establish methodologies, standards and guidelines for the identification of investment opportunities and for the appraisal and evaluation of investment projects. UNIDO assistance would include the provision of training to the staff of the agency in various fields, in particular project evaluation and project appraisal techniques as well as issues regarding contract negotiations with foreign investors, including licensing, transfer pricing, etc. Such training should also be provided to potential national joint venture partners.^{1/}

(ii) Identification of regional development potentials

In the context of promoting private investment (both foreign and domestic) early attention should be given to avoiding the emergence or aggravation of regional disparities. It is generally observed in both developed and developing countries that industrial development tends to concentrate on only a few (or even only one) central areas with the other regions falling behind in terms of income, technology and productivity levels. To some extent this is certainly unavoidable and indeed required to reap the benefits of economies of scale, complementarities and efficient networking of industrial activities. Yet often regional development potentials remain underutilized because either they have remained unidentified or crucial infrastructure and other supporting services are not available.

1/ In this connexion, see pipeline project DP/BUR/88/063, Seminar on Industrial Project Preparation, Evaluation and Financing.

It is therefore suggested to undertake a number of in-depth studies of the industrial development potential in selected states or divisions of the country. Specifically, these studies would

- analyze the resource base for and prospects and constraints of industrial development in the specified region;
- identify the most urgent requirements in terms of infrastructural facilities (transport, water, energy, communication);
- identify in particular the existing capabilities in small and cottage industries, and the type of support measures required to upgrade them with a view to promote industrial linkages;
- prepare opportunity reports on potential new industries to be set up;
- present an action programme (including TA requirements) for the region's future industrial development with special emphasis on human resource and skill requirements.

The appropriate counterpart for such regional opportunity studies would be the Directorate of Regional Industrial Coordination and Industrial Inspection under MI 1 which indicated that the regions Arakan (with bamboo forests as major resource) and Shan could be good cases to start with. High interest in such studies was further expressed by the Myanmar Economic Bank with a view to identifying investment opportunities. Moreover, the involvement of the Central Research Organization could be envisaged as a local partner for technical feasibility studies to be carried out together with overseas consultants.

(iii) Investment Promotion Forum

The Mission discussed the idea of organizing an Investment Promotion Forum in Myanmar in several meetings, including with the Foreign Economic Relations Department, the Chamber of Commerce and Industry and the Union of Myanmar Joint Venture No. 1 Corporation. In all discussions it was considered as an appropriate step to be taken and high priority was attached to the concept.

UNIDO has in the past successfully organized Investment Promotion Fora in many developing countries, including least developed countries. In a first preparatory stage, a portfolio of industrial investment projects is prepared in the country concerned. On the basis of this portfolio, potential overseas investors are contacted by UNIDO. Subsequently, the host government and UNIDO invite these potential investors from both developed and developing countries to the Investment Promotion Forum at which discussions are arranged between the parties concerned on a project-specific basis. These discussions would lay the groundwork (such as signing of letters of intent) for future industrial co-operations in various forms.

It is suggested to start the preparatory activities for such an Investment Promotion Forum as early as possible. In view of the time needed to prepare such a Forum, it could, however, only take place well after the May 1990 elections which will also have a decisive impact on the overall investment climate. Among promising areas for export-oriented joint venture activities the Mission has tentatively identified the following: garments

manufacturing, textiles, furniture making,^{1/} tobacco, marble processing and tanneries and leather products. Attention should also be given to domestic market oriented areas (such as plastic pipes manufacturing) which would have an import substitution effect. As to prospective local partners, special attention should be given to the potential of industrial co-operative societies (e.g. those run by groups of young engineers, graduates of the Yangon Institute of Technology) which could be of special interest to small- and medium-scale foreign partners.

(iv) Specific institutional measures to attract foreign direct investment

International foreign direct investment (FDI) flows in general, and those to developing countries in particular are subject to a complex set of investment determinants. Fiscal and financial incentives (such as tax holidays, special depreciation allowances, etc.) do play a certain role in this regard yet they have shown to be of only secondary importance in attracting FDI. Among the more important factors are the physical infrastructure (transport facilities, water and energy supply), the communications infrastructure (telex, telefax), the human resources infrastructure (availability of cheap skilled labour) and the efficiency of the FDI related administration and approval procedures (ideally in the form of a one-stop investor service).

As an immediate measure to both signal Myanmar's new 'open door' policy vis-à-vis FDI and to establish the most essential preconditions for attracting investment, the creation of an export processing zone in Myanmar could be considered. In general, export processing zones (EPZs) which have been established in many developing countries differ very much in terms of their objectives, organization, management, economic environment, etc. and so does their performance. Some have been remarkably successful, other have failed to reach their objectives depending on how, when, in which context they have been established and operated. While EPZs should not be regarded as a panacea for export-oriented development they have in some cases been successfully used as first windows to the international economy after periods of inward-looking development strategies (Sri Lanka 1979, China 1980). The setting up of an EPZ in Myanmar would involve

- the ability to attract export-oriented FDI into the country in a geographically limited area in which administrative procedures for industrial licenses, trade arrangements etc. would be handled without red tape by a designated authority in the zone; at the same time this would allow a close monitoring of the FDI related production and export activities;
- the achievement of a demonstration effect to foreign entities to become more involved in Myanmar's industrial development;
- the achievement of a demonstration effect to Myanmar private and public industries as to the efficient operation and management of industrial production;

^{1/} Rattan e.g. is at present exported without being processed in the country.

- the opportunity for the country's policy-makers to use the EPZ as limited test area for innovative policy schemes which they may not wish to introduce on a broad scale immediately.

The task ahead would be to clearly define the role and function of an EPZ within the national economy and to create a general atmosphere of reliability and stability as to the terms and conditions under which FDI would be welcome. UNIDO would be able to assist both in the conceptual phase and in all operational aspects of an EPZ.

It should be mentioned in this context that EPZs in some other developing countries have recently been managed more flexibly than previously in terms of (a) allowing also domestic export-oriented enterprises to locate within the zone and (b) encouraging sub-contracting arrangements between EPZ enterprises and outside suppliers of raw materials and other production inputs with a view to establishing backward linkages.

Apart from considering the establishment of a full-fledged EPZ it should be analyzed to what extent less costly institutional arrangements such as bonded warehouses could be used to promote export-oriented production with foreign participation. At present, this is taking place on a limited scale under the so-called Mutually Beneficial Economic Cooperation scheme under which imported raw materials are exempted from customs duties.

With a view to keeping down the investment costs for establishing an EPZ, the issue should be seen in the context of existing industrial estates which are already equipped with basic infrastructural facilities. Reference can be made in this regard to the industrial complex in Syriam and the industrial estate in Pegu (concentrating on textiles industries).

c. Export promotion

Apart from attracting foreign export-oriented investment, the enhanced promotion of domestic manufactured exports is among the major objectives of the country's new Government. This requires a broad range of different supporting services which in addition to production efficiency itself determine the quality of products and thus their competitiveness.

Among these, quality control and standardization are of crucial importance for export markets in which consumers are much more demanding with regard to a consistently high product quality than in the domestic market. In the case of food products - which can be expected to account for a major share of Myanmar's industrial exports in the near future - hygienic and health standards in different export markets will further have to be taken into account.

In the past, insufficient attention has generally been given to quality control aspects in the manufacturing sector. Certain facilities are available at the Central Research Organization (CRO) in Yangon yet they have primarily been accessible so far for state enterprises. CRO is engaged in testing and issuing of quality certificates for both imported and exported products. Strengthening of CRO's capacities in this area is required in particular with regard to the envisaged promotion of manufactured exports, e.g. in the area of food products. Specifically, the Analytical Chemistry Department of CRO would

need to be equipped with modern materials and product testing facilities.^{1/} This would also be important in connection with CRO's research and development efforts to increase the utilization of local resources in industrial production.^{2/}

Packaging is another important area to be considered in the context of export promotion efforts in general, and with regard to food products in particular. As is well-known, many processed food products undergo a degradation in their nutritional value due to damages suffered during storage, handling and transportation, which would be avoided or reduced through using appropriate packaging materials and techniques. Further, improved packaging could make a contribution to a rationalization of the food distribution system thus enhancing its general competitiveness vis-à-vis imported products. Finally it has been shown in many cases that much higher value-added can be conferred to export products which are properly and attractively packaged thus fetching considerably higher prices in export markets.

The Mission noticed that in Myanmar the costs of packaging materials for food products are excessively high. This applies in particular to tin cans which need to be imported often at prices which are higher than the export prices to be obtained for the canned products themselves. Tin cans are at present used for a number of food products such as tomato concentrate, mixed vegetables, strawberry jam, pineapples, pears and onions and they could also be used for a number of fish products. The Mission learned that a domestic tin canning facility catering to the needs of various industries was established in 1985. However, due to high operating costs the production of tin cans has been discontinued. It may be appropriate, however, to reassess the project in the light of the new export promotion emphasis which is likely to lead to new demand parameters.

Furthermore, the potential for introducing new packaging materials and systems should be studied. These should preferably be based on available local resources; in some cases, particularly with regard to food products, plastic bags may also be considered. Technical advice is needed regarding packaging design and for improving paper quality and durability. In this context, the recommendations made by the ITC Senior Expert Packaging Adviser, Mr. N.C. Robson, following his December 1987 mission should be taken into consideration and close co-operation with ITC should be sought in this area.

d. Human resource development

A key element in each of the above-mentioned areas for attention by the Government and for consideration by UNDP/UNIDO in reviewing the country

1/ A specific request for short-term assistance has been received by the Mission concerning the proper use of available new equipment for gas liquid chromatography.

2/ A pilot plant to produce calcium carbide based on domestic raw materials is available at CRO. Short-term technical assistance would be needed, however, to operate the equipment.

programme is the development of human resources for industrial development. As is generally recognized, it is the quality of a country's human resources that provides much of the competitive edge for its industry and for the efficiency of a continuous industrial restructuring process. This relates both to the mastering of modern industrial technologies and to the surrounding support services such as maintenance and repair, research and development, computer services including software services, marketing skills, etc. It is noteworthy that the prevailing lack of a formal vocational training system in Myanmar constitutes a major constraint for new private industries in terms of their access to skilled labour. The existing industrial training institutions (such as the Industrial Training School in Syriam) cater exclusively to the requirements of state enterprises with their trainees being committed for a minimum period of 5 years to work in state enterprises.

Due to the long period of isolationist development in Myanmar there is a vast need for training of human resources at all levels and in all branches of industry. In order to avoid sporadic and non-coordinated assistance, the Mission strongly recommends that an Umbrella Training Project should be formulated to incorporate all the needs and requirements in various industrial areas. Such an umbrella project should be preceded by a preparatory phase, during which a more specific assessment of the training needs as well as appropriate financial allocation will be made. In this connexion, a close co-operation with the ILO ongoing project and planned programmes should be established in order to avoid overlapping and duplications.

It is foreseen that exposure to up-to-date industrial technologies and organizational innovations abroad would be an essential training component for selected company managers and high-level technical staff. Thus provision for the organization of such study/observation missions on a case-by-case basis might be included in the umbrella project.

e. Support to the metalworking and engineering industries

In recognition of the key role played by the engineering industries as the foundation of the country's industrial development, major attention should be given to the strengthening of this sector, in which important activities are undertaken at the state, co-operative and private sector levels. Particular attention should be given to the development of intermediate engineering products industries - foundry and casting, forging, metal cutting and machining, mould, tool and die making, metal components and parts production and fabrication which will have a major impact on other manufacturing sectors.

The Mission was given to understand from discussions with enterprise representatives at the state, co-operative and private sector levels that main constraints are related to the raw material supply. Insofar as the smaller entities - co-operatives and private firms - are concerned, materials testing and effective utilization left much to be wanted. On the other hand, many innovative efforts in product and/or plant design merited attention.

It is understood that the Metallurgical Research and Developing Centre under the Ministry of Mines (established under JICA assistance) provides training and development work in foundry casting. Job casting work for the mining industry's requirements (as well as for other purposes) is,

furthermore, done by small private foundry shops, including those belonging to the Mandalay Engineering Co-operative 'Sein Ban'.

Promising work has also been carried out at the workshop at the Yangon Institute of Technology. This workshop (assisted 1979-82 by UNIDO) has three components - foundry shop, fabrication shop and electrical shop - which have been used for production of prototypes and direct training of the engineers and technologists to graduate from the Institute.

Another activity of direct relevance is that of the FRG assisted Industrial Training Centre No. 1 at Syriam (under Ministry of Industry No. 1): This centre is well equipped and, inter alia, has a CNC machine tool which has been used among others to make moulds for the Syriam glass bottling plant (under Ministry of Industry No. 1).

The Mission feels that the activities referred to above might be consolidated, complemented and strengthened in the light of the need to upgrade and develop the country's machinery and metalworking industries. Particular attention may be given to develop and raise the level of technology of the small- and medium-scale machinery and metalworking industries as well as to develop personnel towards building up a pool of skilled labour ready to meet the needs of domestic and foreign investors. Consideration may be given to the early establishment of a metalworking industry development institute aimed at raising the quality levels of processes such as welding and sheet metal working, machinery, heat treatment, electroplating and presswork. It may, furthermore, focus on development work on products in areas such as agricultural machinery, food processing equipment and other industrial machinery parts and components as well as moulds and dies.

f. Small-scale and supporting industries

It was noted above that the industrial sector in Myanmar has in the past been dominated by state economic enterprises with private industries confined to cottage and small-scale activities, mostly in the area of food-processing. The resulting structural imbalance now needs to be redressed. Specifically two directions may be pursued in this regard. The first is the promotion of the transition of traditional agro-based small enterprises from servicing only the local market to servicing the national market and eventually even export markets. A growing tourism industry could provide an impetus to this development. The second field is the promotion of small-scale supporting industries which would be providing medium and large enterprises with specialized parts, components, tools and associated services. In the long run, this would lead to the building-up of an efficient network of sub-contracting relationships which could enhance the dynamism and resilience of the entire industrial sector.

Some of the existing co-operatives could play an important role in this process. Since September 1988, co-operatives enjoy equal status with other government or private organizations including the right to enter into joint ventures with foreign partners. The Mission has visited a number of co-operatives and was generally impressed by the skills displayed in a wide range of industrial activities. A request has been received from the Cottage Industries Department for the establishment of a Model Cooperative Industrial Estate in Insein Township, Yangon Division. The envisaged industrial estate

would accommodate 13 Yangon-based industrial co-operatives and provide common facilities for their operation. These co-operatives - whose members are mostly graduates from the Yangon Institute of Technology - are currently located on the university campus and are hampered by serious constraints due to lack of equipment and space. The present activities at the university campus have to a certain extent developed from the UNIDO assistance provided under project BUR/74/022, "Strengthening of Production Orientation and Technical Extension Services at Rangoon Institute of Technology". The new project proposal is supported by the Mission; in this context it should be noted that ILO is at present implementing a project "Development and Expansion of Skills for the Cooperative Small Scale Industries Workers" (BUR/85/007/B/01/11) which may be seen as a complementary activity.

An important area for small-scale and/or co-operative supporting industries is the production of spare parts for the country's enterprises in areas such as agro-processing (e.g. rice milling, edible oil processing), textiles manufacturing and mining. Specifically, the domestic production of replacement parts for the textiles factories (such as wooden shuttles) could be substituted for present imports. The establishment of a central workshop for textile industry spare parts may be considered to more efficiently produce the required spare parts and to solve some of the related technical problems such as the wood-seasoning in the case of shuttles. It is estimated that annual shuttle requirements are in the range of 300,000 for powerlooms only. The Mission recommends to carry out a techno-economic feasibility study on the possibility to produce shuttles by utilizing domestic wood material.

g. Industrial rehabilitation

Based on the government's new policy to operate state economic enterprises in accordance with the principles of efficient management, market orientation and without further subsidization, efforts at rehabilitation of public enterprises will be essential to consolidate their performance. It is suggested by the Mission to launch an industrial rehabilitation study with the aim:

- to identify those state economic enterprises which appear to be economically viable in the long run;
- with regard to these identified enterprises to prepare a rehabilitation action programme covering managerial, technical, financial and marketing requirements;
- to propose organizational measures to be taken with a view to rationalizing the structure of public industries and give more autonomy (in areas such as pricing and investment decisions) to individual enterprises.

Energy efficiency would be a specific aspect to be looked into in potential rehabilitation programmes. The Mission learned that in a number of factories a conversion from oil to gas had recently been undertaken yet various technical problems were being encountered in efficiently applying the new processes.

h. Summary of project concepts

Below the new project concepts identified in the previous sections are listed:

- Organization of a high-level industrial strategy seminar;
- Assistance in establishment of an investment promotion agency;
- Study on identification of regional development potentials;
- Organization of an Investment Promotion Forum;
- Assistance in establishment of an export-processing zone;
- Assistance in quality control and standardization;
- Assistance in new forms of packaging for food exports;
- Umbrella industrial training project;
- Assistance to the metalworking industries;
- Establishment of a model industrial estate for industrial co-operatives;
- Central workshop for textile industry spare parts;
- Industrial rehabilitation studies for state economic enterprises.

i. Assignment of SIDFA

In order to develop, monitor and follow-up the growing UNIDO programme in Myanmar and to advise the Government on project identification and project formulation, the Mission stressed the urgent need for assigning a SIDFA to Myanmar. The proposal was strongly supported by UNDP and the Mission was further assured that all necessary action has been taken by the Regional Bureau for Asia and the Pacific, UNDP New York, to identify and assign to the country an appropriate SIDFA as soon as possible.

3. Review of existing pipeline projects

In addition to the new concepts and ideas indicated above, the existing pipeline projects have been reviewed by the Mission and classified in two categories.

a. Priority A

The following pipeline projects fit well within the context of the new policies and industrial strategy; i.e. they are production oriented, contribute to generation/saving of foreign exchange (export promotion/import substitution), promote private sector and contribute to industrial manpower development. They should be considered as priority "A" projects for immediate follow-up. While the original objectives of the projects remain valid some projects may, however, need to be reformulated in order to reflect the new development strategy.

1) Industrial Energy Efficiency

Bearing in mind the acute shortage of energy for industry, the purpose of this project is to assist the country in improving industrial energy use/efficiency, by way of training local staff in introducing energy conservation measures/programmes (optimum energy utilization and thus reducing the cost of energy to industry) and identifying indigenous

energy resources including fuel substitution. A specific need put forward to the Mission is assistance to those plants which have recently converted from oil to gas as energy resource. The project should start with a preparatory phase (6 weeks consultant) to draft the Project Document for the second phase. The preparatory project concept has already been submitted to UNDP on 3 October 1988.

2) DP/BUR/88/001: Strengthening Welding Capability of Myanmar Shipyards

The project emanates from recommendations of UNIDO SI/BUR/86/011, "Formulation of Development Programme to Improve Testing, Quality and Standard Welding". The objectives of this project is to strengthen the welding capability of the Myanmar Shipyards to ensure production of high quality welded structures (at international standard) by way of creating a quality control laboratory and training of at least 75 local staff to international standard. The Project Document (\$397,000) was submitted on 3 October 1988 to UNDP for consideration.

3) DP/BUR/88/002: Assistance to Burma Sinmalaik Foundry

The Sinmalaik Foundry is producing castings for the construction of cargo ships, passenger boats and railways. The purpose of this project (based on the recommendations of the UNIDO SI/BUR/86/863 "Assistance to Sinmalaik Foundry") is to raise the productive and technical capability of the plant by way of development of a comprehensive "on the job" training programme and creation of a quality control unit. The draft Project Document (\$397,000) was submitted on 16 March 1988 to UNDP.

4) DP/BUR/88/003: Production Plant for Bamboo Kraft Lignins and Inorganic Salts

This is a follow-up project to the DP/BUR/85/015 "Lignin Utilization - Pilot Phase" which was successfully implemented. The purpose of this project is to assist in the utilization of different lignin-based products for the production of autobatteries and in the petroleum drilling industry. Presently Myanmar imports such lignin-based products from USA. Under this project the lignin by-products (Indulin AT and Indulin C) will be locally produced from the black liquors (waste product) in the pulp and paper mills. The Project Document (\$264,000) was submitted on 29 July 1988 to UNDP.

5) DP/BUR/88/004: Pilot Plant for Production of Artemisinin

Because of the priority given to the malaria problem in the country, the Ministries of Agriculture, Health and Industry are co-operating in an effort to produce artemisinin locally. Myanmar Pharmaceutical Industries is cultivating the medicinal plant "Artemesia annua" on its farms in Upper Myanmar. The purpose of this project is to set up a pilot plant for extraction of Artemisinin and produce malaria tablets (import substitution). The Project Document for preparatory phase (Feasibility study) was submitted to UNDP in August 1988.

6) DP/BUR/88/015: Development of Mechanical Pulps for Newsprint and its Related Paper Grades

This is a follow-up to the DP/BUR/77/004 Project. The project will assist in utilization of locally available fibrous raw material such as tropical hardwoods, bamboo, bagasse, straws, reeds, jute sticks, cotton stalks, etc. for newsprint manufacturing. Considering the high import cost for newsprint, the project could lead to a substantial import substitution effect based on exploitation of natural resources. The revised Project Document (\$1,597,000) is with UNDP/Government for consideration and approval.

7) DP/BUR/88/028: Reconditioning of Machine Parts

The purpose of this project is to set up a centre for reconditioning machine parts with a technical capacity to repair, recondition and manufacture spar parts for both the public and private sectors. The project will thus contribute to foreign exchange savings through import substitution (approximately \$79 million yearly) and provide service to the private sector. The draft Project Document (\$1.4 million) is with UNDP/Government for consideration. The project was recommended, however, to

a) start with pilot operation;

b) cover the needs and requirements of all three Corporations within the Ministry of Transport and Communications, namely

- Myanma Shipyards
- Inland Water Transport
- Myanma Railways.

Therefore, the project document should be reformulated and an appropriate government counterpart agency identified.

8) DP/BUR/88/049: Htan Pin Gyan Salt Works

The main purpose of the project is to assist as a pilot effort the above salt works in reducing the energy input per ton (at least 10%) and thus improve the cost effectiveness at salt making. The Project Document is with UNDP/Government for consideration. It will have to be modified to reflect the new project site which has been proposed due to security reasons.

9) DP/BUR/88/034: Production of Spirulina Algae as a Nutritional Supplement

The project is to assist in experimental production of Spirulina as a nutritional supplement for the local market and for export, based on a locally available biological resource. The project will thus contribute to the export promotion and foreign exchange saving. Draft Project Document (\$950,000) being considered by UNDP/Government.

10) DP/BUR/88/063: Seminar on Industrial Project Preparation, Evaluation and Financing

The purpose of this project is to upgrade the professional capabilities of 20-25 Burmese officials in project preparation, evaluation and financing. The project should also include participants from the country's banks, the private sector and co-operatives. The draft Project Document is with the UNDP/Government for consideration.

11) DP/BUR/88/005: Development of Protein Rich Foods from Beans and Pulses

This project aims at investigating the potential usefulness of beans and pulses, including soybean, in producing food products of high quality nutrition. At present, soybean is being used for making soy sauce. Preliminary investigations are being carried out by the Central Research Organization on the processing of soybean to produce soymilk and other products. Soymilk would be used for feeding the children at children's hospital who are currently suffering from diarrhea and thus malnutrition since they cannot drink cows' milk.

This project would contribute to the setting-up of agro-based food industries using locally available protein rich beans and pulses and raw material. Should the study prove the commercial viability of the project, it could also contribute to the promotion of private investment in this sector. The Project Document (\$1.56 million) is with UNDP/Government for consideration. The Project Document needs to be redrafted to include more background information and substantive details.

12) De-inking of Waste Paper and the Sittang Mill

The project (to be financed under UNIDO resources) will assist the Mill in optimizing a home-made lamort de-inking system in which about 30 tons/month of newsprint waste is de-inked, in order to broaden the raw material basis for pulping and paper making. Draft project data sheet is with UNDP/Government for consideration.

13) Improvement of Sittang Pulp and Paper Mill Operation by Desilication

This project will assist the Mill in carrying out a study on precipitation of Silica and prepare a plan for establishment of a desilication unit for the Mill. The draft project data sheet (for financing under UNIDO resources) is with UNDP/Government for consideration.

b. Priority B

The following projects do not immediately contribute to the main new emphasis areas such as the generation and/or saving of foreign exchange, promotion of private industries, etc. They are, however, well designed projects which would contribute to the overall development of the industrial sector (i.e. R&D project) development of industrial manpower and institutional infrastructure. They may be, therefore, considered as Priority "B" and followed-up as and when required.

- 1) DP/BUR/88/001: Development Centre for Leather Technology,
(\$2.2 million)
- 2) DP/BUR/88/011: Establishment of a Pilot Plant Plastics Appliances
Extrusion Demonstration Unit;
(\$500,000)
The potential for plastic pipe production for international joint
venture collaboration has been indicated in V.b.(3)
- 3) DP/BUR/88/023: Development Centre for Food Technology;
(\$1.0 million)
- 4) DP/BUR/88/033: Strengthening of Electrical Inspection Department,
Electric Testing Laboratory;
(\$945,550)
The project is being reformulated to reflect its potential impacts on
the industrial sector's use of electricity.
- 5) DP/BUR/88/064: Solar Electricity for Houses;
(\$482,000)

6) Technical Assistance to the Petroleum Industry
The original objective of this project was to produce electricity from hydrocarbons. In view of the shortage of oil (and since natural gas is being already utilized for this purpose) the project is no longer acute. However, in discussion with Myanma Petrochemical Enterprise, the Mission was given to understand that assistance is required in the processing of coak and methanol as well as for the reclaiming of spent lubricant oils. Assistance is also needed in training of technical staff of the enterprise.

7) Modernization of Sea Salt Works at Phyapon

This project (which is proposed to be financed under UNIDO resources) is expected to assist the Myanma Paper and Chemical Industries in planning and designing of a modern salt works to produce up to 45,000 t/year of high purity salts which would also be used in caustic soda/chlorine plants. The project data sheet is with UNDP/Government for consideration.

ANNEX I

Statistical Tables

Table A-1. Imports by type of commodity, 1985/86 - 1987/88
(in million kyat)

Type of Commodity	1985/86	1986/87	1987/88 ^{a/}
<u>Consumer goods</u>	572.2	234.1	222.0
Durable goods	273.0	80.2	106.3
Foodstuffs	63.7	2.5	12.0
Textiles	61.5	16.1	31.0
Medicines & pharmaceuticals	121.9	104.8	50.0
Other consumer goods	52.1	30.5	22.7
<u>Raw materials & spares for inter-industry use</u>	1484.7	1158.1	1207.7
Raw materials	981.8	643.3	499.7
Fuel	0.3	-	-
Tools & spares	502.6	514.8	708.0
<u>Capital goods</u>	2741.3	2522.2	2614.3
Construction materials	505.1	583.5	691.1
Machinery & equipment	1789.3	1484.0	1130.1
Transport equipment	303.3	336.5	695.6
Other capital goods	143.6	118.2	97.5
Commodity unspecified	3.8	21.7	21.7
TOTAL	4802.0	3936.1	4065.7

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Table A-2. Composition of state capital expenditure 1985/86 - 1988/89
(in million kyat)

Sector	1985/86		1986/87		1987/88 ^{a/}		1988/89 ^{a/}	
	Amount	%	Amount	%	Amount	%	Amount	%
Agriculture	767	12.0	584	9.2	783	12.8	570	9.9
Livestock & fishery	177	2.8	181	2.8	114	1.9	156	2.7
Forestry	191	3.0	185	2.9	186	3.0	187	3.3
Mining	319	5.0	239	3.8	394	6.4	664	11.6
Processing & manufacturing	1852	28.9	1524	24.1	1234	20.1	1036	18.0
Power	660	10.3	559	8.8	774	12.6	577	10.1
Construction	382	6.0	581	9.2	570	9.3	332	5.8
Transport & communications	813	12.7	1120	17.7	1088	17.8	1178	20.5
Trade	177	2.8	157	2.5	124	2.0	99	1.7
Social services	589	9.2	556	8.8	433	7.1	381	6.6
Financial institutions	24	0.4	14	0.2	17	0.3	29	0.5
Administrative organizations	399	6.2	504	8.0	268	4.4	430	7.5
Town & City Development Committees	47	0.7	127	2.0	143	2.3	102	1.8
TOTAL	6397	100.0	6331	100.0	6128	100.0	5741	100.0

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Table A-3. Production of livestock, livestock products and fish, 1988/89
(in thousands)

	Unit	1988/89 ^{a/}
Draught cattle	Nos	6,774
Fresh milk	Viss	407,950
Hides & skins	Nos.	413
Skins (goat & sheeps)	Nos.	808
Total meat production	Viss	138,481
Total egg production	Nos.	1,288,848
Freshwater fish	Viss	2,066
Marine fish	Viss	9,945

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Table A-4. Production of major minerals, 1988/89
(in tons, unless otherwise indicated)

Minerals	Production 1988/89 ^{a/}
Zinc concentrates	5,080
Refined lead	4,054
Tin concentrates (65%)	389
Tungsten concentrates (65%)	75
Barytes	13,000
Gypsum	31,175
Jade (kg)	14,254
Refined silver ('000 oz)	296
Steel billets	10,000
Copper concentrate	24,726
Coal	32,000
Crude oil ('000 barrels)	4,612
Natural gas (mm ft ³)	42,350

Source: Ministry of Planning and Finance, Review of the Financial, Economic and Social Conditions for 1989/90.

a/ Provisional.

Table A-5. Structure of manufacturing value added, 1974/85-1984/85
(percentages based on constant prices)

	1974/75	1980/81	1981/82	1982/83	1983/84	1984/85 _{a/}
Food and beverages	42.5	37.8	36.5	36.8	39.0	38.8
Clothing and wearing apparel	8.8	11.5	11.0	11.2	10.4	9.4
Construction materials	12.3	11.4	10.4	10.2	10.2	10.0
Personal goods	5.3	5.4	5.8	5.3	4.1	4.3
Household products	0.7	0.8	0.8	1.0	0.9	0.9
Printing and publishing	2.1	2.7	2.8	3.1	3.1	3.4
Industrial raw materials	6.4	9.6	10.2	10.1	11.2	11.4
Mineral and petroleum products	13.1	9.4	9.5	9.3	8.7	9.7
Agricultural equipment	0.9	1.8	1.4	1.3	1.2	1.1
Manufacturing machinery & equipment	0.4	0.3	0.1	0.3	0.3	0.3
Transport equipment	3.4	4.4	5.1	5.6	5.3	5.3
Electrical products	0.8	0.7	1.0	0.8	0.8	1.1
Miscellaneous	3.3	4.2	5.4	5.0	4.8	4.3
Total industrial sector	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Planning and Finance, Planning Department.

a/ Revised estimates.

Table A-6. Production of processing and manufacturing sector
by commodity group
(Quantum index 1985/86 = 100)

Commodity Group	1986/87	1987/88 ^{a/}	1988/89 ^{a/}
Food & beverages	97.36	95.32	96.82
Clothing and wearing apparel	69.09	57.94	52.51
Construction materials	97.67	82.91	72.54
Personal goods	78.62	50.89	36.79
Household goods	110.11	96.27	102.99
Printing and publishing	108.69	70.25	66.07
Industrial raw materials	86.22	76.59	64.59
Mineral & petroleum products	79.87	77.62	75.31
Agricultural equipment	95.35	83.01	55.96
Machinery & equipment	126.88	119.73	151.59
Transport vehicles	78.29	59.39	62.70
Electrical goods	90.41	70.68	60.44
Miscellaneous	76.26	90.42	69.94
TOTAL	93.20	88.72	87.53

Source: UNIDO, Industrial Development Review Series: Burma, PPD.65,
16 December 1987.

a/ Provisional.

Table A-7. Relative shares of industrial subsectors in total gross value of industrial production, 1971/72 and 1983/84-1986/87
(percentages based on 1969/70 constant prices)

	1971/72			1983/84			1984/85			1985/86			1986/87 ^{a/}							
	State	Co-op.	Priv- Total	State	Co-op.	Priv- Total	State	Co-op.	Priv- Total	State	Co-op.	Priv- Total	State	Co-op.	Priv- Total					
Food and beverages	29.0	-	71.0	100	26.2	2.9	70.9	100	23.9	3.2	72.8	100	21.5	3.7	74.8	100	21.7	7.1	71.2	100
Clothing and wearing apparel	25.3	27.7	47.0	100	35.6	12.0	52.4	100	34.1	10.6	55.3	100	30.0	13.1	56.9	100	23.2	11.5	65.3	100
Construction materials	62.2	0.3	37.5	100	59.5	3.0	37.5	100	56.0	5.5	38.5	100	60.7	3.1	36.2	100	59.3	7.4	33.3	100
Personal goods	87.3	-	12.7	100	88.5	0.7	10.8	100	87.1	0.9	11.8	100	86.5	1.5	12.0	100	85.3	1.4	13.3	100
Household products	76.9	-	23.1	100	56.7	2.2	41.1	100	54.2	0.4	45.4	100	53.0	0.4	46.5	100	39.3	0.4	60.3	100
Printing and publishing	92.0	-	8.0	100	94.0	5.6	0.4	100	96.0	3.6	0.4	100	89.0	7.1	3.9	100	92.8	3.0	4.2	100
Industrial raw materials	89.5	-	10.5	100	80.4	0.2	19.4	100	76.3	0.2	23.5	100	79.8	0.2	20.0	100	79.6	3.0	4.2	100
Mineral and petroleum products	95.2	-	4.8	100	86.5	0.8	12.7	100	86.0	1.0	13.0	100	85.8	1.1	13.1	100	85.8	1.3	12.9	100
Agricultural equipment	100.0	-	-	100	100.0	-	-	100	100.0	-	-	100	100.0	-	-	100	94.9	-	5.1	100
Manufacturing machinery & equipment	100.0	-	-	100	97.9	-	2.1	100	92.4	1.8	5.9	100	97.6	1.5	0.9	100	97.6	2.0	0.4	100
Transport equipment	77.9	-	22.1	100	87.5	-	12.5	100	87.5	0.1	12.4	100	91.1	0.2	8.7	100	88.2	0.2	11.6	100
Electrical products	90.1	-	9.9	100	99.1	-	0.9	100	98.3	-	1.7	100	99.2	-	0.8	100	98.8	-	1.2	100
Miscellaneous	<u>11.1</u>	<u>-</u>	<u>88.9</u>	<u>100</u>	<u>72.8</u>	<u>2.5</u>	<u>24.7</u>	<u>100</u>	<u>74.1</u>	<u>3.3</u>	<u>22.6</u>	<u>100</u>	<u>73.8</u>	<u>4.4</u>	<u>21.8</u>	<u>100</u>	<u>77.3</u>	<u>2.4</u>	<u>20.3</u>	<u>100</u>
Total	41.6	3.6	54.8	100	42.5	3.3	54.2	100	40.5	3.5	56.0	100	39.5	3.9	56.6	100	39.3	6.0	54.8	100

Source: Report to the Pyithu Hluttaw, various issues.

^{a/} Provisional.

Table A-8. Factories under the Ministry of No. 1 Industry

Industrial branch	No. of Factories
<u>Myanma Textile Industries</u>	
(1) Spinning & weaving factories	5
(2) Textile finishing plant	2
(3) Garment factories	4
(4) Knitting factory	1
(5) Textile mills	12
(6) Blanket factories	3
(7) Towel factories	3
(8) Ginning industry	1
(9) Sewing thread factory	1
(10) Silk reeling factory	1
(11) Tarpauling factory	1
(12) Dyeing & printing factory	1
<u>Myanma Foodstuff Industries</u>	
(1) Sugar mills	5
(2) Cigarette factories	2
(3) Brewery & distillery plant	1
(4) Canning factories	2
(5) Tapioca starch factories	2
(6) Alcohol plants	2
(7) Rice & aerated water factories	11
(8) R.O. seal factory	1
(9) Noodles factory	1
(10) Biscuit factory	1
(11) Mono sodium glutamate plant	1
(12) Flour mills	2
(13) Coffee factory	1
(14) Tea factories	2
(15) Flue cured Virginia tobacco	1
(16) Soya bean sauce, chilli sauce & vinegar	1
<u>Myanma Pharmaceutical Industries</u>	
(1) Pharmaceutical plant	1
(2) Soap factories	3
(3) Plastic factories	3
(4) Coconut oil factory	1
(5) Toilet factory	1
(6) Pharmaceutical raw material factory	1
(7) Hydrogenated fat plant	1
(8) Refined oil factory	1

Table A-8 (continued)

Industrial branch	No. of Factories
<u>Myanma Metal Industries</u>	
(1) Steel mill	1
(2) Aluminium ware factory	1
(3) Enamel ware factories	2
(4) Works & maintenance factory (including wood working factory)	1
<u>Myanma Ceramic Industries</u>	
(1) Cement factories	3
(2) Sheet glass factory	1
(3) Asbestos cement factories	2
(4) Glass factory	1
(5) Brick factories	3
(6) Concrete pipe manufacturing plant	2
(7) Porcelain ware factories	2
(8) Marble factory	1
(9) Sodium silicate factory	1
<u>Myanma General Industries</u>	
(1) Leather factories	3
(2) Shoes factories	3
(3) Packaging factories	2
(4) Rubber products factories	2
(5) Duck feather treatment plant	1
(6) Fountain pen factory	1
(7) Umbrella factory	1
(8) Thermos flask factory	1
<u>Myanma Paper & Chemical Industries</u>	
(1) Paper mills	3
(2) Paints & varnishes factories	2
(3) Match factories	2
(4) Chemical factory	1
(5) Gas factory	1
<u>Myanma Jute Industries</u>	
(1) Jute mills	2
(2) Jute carpet factory	1
(3) Coir rope factory	1
(4) Jute baling press factories	1

Source: Information provided to the Mission.

List of persons met and industries and institutions visited by the
UNIDO industry sector review mission to Myanmar, 12-29 June 1989

YANGON

MINISTRY OF NO. 1 INDUSTRY

Industrial Planning Department

Col. Aung Koe, Director General
U Nyunt Hlaing, Director (Project Planning)
U San Thein, Director (Production Planning)
U Tun Aye, Director (Manpower Planning)
Daw San San Aye, Director (Financial Planning)
U Saw Aung, Deputy Director (Project Planning)
Dr. Win Myint, Deputy Director (Project Planning)
Daw Tin Myint Oo, Deputy Asst. Director (Project Planning)
U Tin Maung Win, Head of Department (Project Planning)
U Soe Myint, Asst. Planning Engineer (Project Planning)

Directorate of Regional Industrial Co-ordination and Industrial Inspection

U Tun Hla, Director General
U Tun Shein, Director (Regional Industrial Co-ordination)
U Tin Tun, Director (Boiler Inspection)
U Yu Kyi, Director (Electrical Inspection)
U We Lin, Deputy Director (Boiler Inspection)
U Win, Director (Industrial Inspection)
U L. Zaw Shan, Deputy Director (Regional Industrial Co-ordination)
U Khin Maung Swe, Asst. Director (Electrical Inspection)

Myanma Textile Industries

U Thein Tan, Director (Planning)
U Aung Gyi, Deputy Director (Planning)
Daw Sein Sein, Deputy Director (Finance)
Daw Khin Than Nwe, Deputy Director (Marketing)
U Thein Aung, Asst. Director (Marketing)

Myanma Ceramic Industries

U Aung Khin, Director (Planning)
U Kyi Myint, Director (Finance)
U Maung Ni, Director (Production)

Myanma Foodstuff Industries

U Maw, Deputy Director (Planning)
U Kyi Soe, Deputy Asst. Director (Export)
Daw Khin Mon Thein, Head of Department
Naw Hughta Ba Htin, Head of Branch
U Win Nyunt, Asst. Planning Engineer
U Khin Maung Thwin, Head of Branch

Myanma Pharmaceutical Industries

U Ban Yi, Director (Planning)
U Win Kyi, Project Director (Pesticide)
U Ba Myint, Head of Department (Planning)
U Than Myint, Head of Branch
Dr. Min Thein, Project Director (Spirulina Algae Production)

Myanma Paper and Chemical Industries

U Ko Ko, Director (MPCI)
U Maung Maung Kyi, Asst. Director (MPCI)
Dr. Win Myint, Deputy Director (IPD)
Daw Tin Myint Oo, Deputy Asst. Director (IPD)
Daw Khin Mu Win, Head of Department (IPD)
Daw Aye Shwe, Head of Section (IPD)

Myanma General Industries

U Saw Myint, Managing Director
U Htay Aung, Director (Planning)
Daw Khin Khin, Deputy Director (Planning)
U Mya Thaug, Project Director (DCRT)
U Soe Aung, Project Director (DCLT)

Myanma Jute Industries

U Khin Maung Nyunt, Managing Director
U Zaw Sein Win, Director (Planning)
Daw Soe Soe Aye, Deputy Asst. Director (R&D)

Myanma Metal Industries

Col. Tin Htut, Managing Director
U Maung Maung Aye, Director (Planning)
U Htay Lwin, Director (Production)
U Zaw Win, Director (Finance)
U Nyi Hla, Deputy Director (Planning)
U Hla Tin, General Manager (Steel Mill)
U Nyunt Hlaing, Production Engineer (Steel Mill)
U San Taing Myint, Asst. Planning Engineer

MINISTRY OF NO. 2 INDUSTRY

Myanma Heavy Industries

Lt. Col. Sein Htoon, Director (Planning)
Daw Hta Hta Yee, Director (Finance)
U Zaw Win, Deputy Director (Planning)
U Aung Soe Win, Asst. Director (Planning)
U Win Tint, Deputy Asst. Director (Planning)

Central Research Organization (CRO)

Dr. Maung Maung Gale, Director General
Lt. Col. Aung Pe, Deputy Director General
Dr. Myint Han, Director, Pulp & Paper Research Department
Dr. Pe Win, Head, Polymer Research Department

MINISTRY OF PLANNING AND FINANCE

Planning Department

Daw Khine Khine, Director General (Secretary to the Union of Myanmar
Foreign Investment Commission)
U Waing, Deputy Director - 2
U Thein Maung, Assistant Director
U Set Maung, Adviser
U Sang Khup, Additional Director
Daw Khin Nwe Aye, Deputy Director - 2

Foreign Economic Relations Department (FERD)

U Soe Thwin, Director General

MINISTRY OF TRADE

Directorate of Trade

U Maung Maung Kyaw, Director General
U Khin Maung Oo, Director
U Aung Kyi, Additional Director, International Trade Department

MINISTRY OF ENERGY

Myanma Petrochemical Enterprise

U Hlaing Myint San, Managing Director
U Aye Kyaw, Director (Production)
U Kyaw Sein, Director (Planning)
U Mya Phay, Director (Finance)

Energy Planning Department

U Tin Tun, Director General
U Boon Kyi, Deputy Director General
U Soe Myint, Director
U Kyaw Win, Director
U Thein Lwin, Director
Cmdr. Thein Tun, OSD

MINISTRY OF CO-OPERATIVES

Cottage Industries Department and Co-operatives Department

U Thaung Hlaing, Director General (Co-op)
Dr. Than Htaik, Director General (CID)
U Ba Htwe, Director (CID)
U Tin Aung, Director
U Myint Than, NPC (ILO Project)
U Ko Ko Aung, Deputy Director (Coop)
U Aung Kyi, Planning Engineer
U Tin Hlaing, Deputy Director (Industrial Branch)
Daw Tin Swe Aye, Deputy Director
U Tin Aung, Deputy Director (Planning)
Dr. Tun Aung Prue, Deputy Director, Research (Oils & Fats Technologist)

MINISTRY OF TRANSPORT AND COMMUNICATIONS

Myanma Shipyards

U Thein Tun, Managing Director
U P. Maung Maung, Deputy Managing Director
U Chit Oo, Chief Accountant
U Tin Maung Nyunt, Chief Engineer
U Kyaw Kyaw, Ex. Engineer (Production)
Dr. Khin Maung Oo (Shipbuilding & Repairs)

Inland Water Transport

U Aye Min, General Manager
U Tin Win, Deputy General Manager
U Tun Myint, Controller of Stores

MINISTRY OF MINES

Myanma Salt and Marine Chemical Enterprise

U Kan Gyi, Managing Director
U Aung Khaine, Deputy General Manager
U Ko Ko Lay, Divisional Manager
U Po San, Divisional Manager

MINISTRY OF AGRICULTURE AND FORESTS

Myanma Timber Enterprise

U Ohn, Project Director (ADB Forestry II Project)
U Khin Oo Oung, Project Manager, Timber Distribution Project (World Bank Loans)

Union of Myanmar Joint Venture Corporation (1)

U Yu Saing, Chairman
U Khin Maung Ohn, Managing Director
U Hla Tin, Director
U Kyaw Za, Director
U Bo Sein, Director
U Aung Thein, Director
U E Khong, Director
U Lay Shan Khaw, Director (General Manager)

Union of Myanmar Chamber of Commerce and Industry

U Yu Saing, President
U Maung Maung Nyunt, Vice President
U Aung Htut, Honorary Secretary (former Mgr. Myanma Export/Import Corp.)
U Tin Htut, Joint Secretary
U Hram Uk, Chief Executive Officer

Myanma Economic Bank

Daw Yi Yi, Managing Director
U San Shew Aung, General Manager
U Shwe Pru, Asst. General Manager
U Khin Maung, Manager
U Aung Thein Win, Manager

Yangon Institute of Technology

U Maung Maung Than, Rector
U Aung Than, Pro-rector
Dr. San Tint, Professor of Electronic Engineering

Dr. Than Nyun, Vice Rector, Institute of Economics, Yangon
U Myat Thein, Associate Professor, Head, Department of Applied Economics,
Institute of Economics, Yangon
Mr. Roger Bowlby, ILO Manpower Planning Expert

UNDP

Mr. K. Kitatani, Resident Representative
U Htin Aung, Programme Officer
Ms. Rekha Thapa, Programme Officer

FIELD TRIP, 16-19/6/89

DAIK-U

Foodstuff Industries Complex (Monosodium Glutamate Factory and Tapioca Starch Factory)

U Saw Win Thein, Area Commander and General Manager (Tapioca Starch Factory)
U Khin Maung Lwin, General Manager (Monosodium Glutamate)

ZEYAWADDY

Sugar Mill

U Kyaw Yin, General Manager (Acting)
U Tun Aye (Chief Engineer)
U San Tun Aung (Chief Chemist)
U Kan Tha, Asst. Factory Manager (Admin)
U Maung Maung Than, Cane Procurement Officer

YENI

Paper Mill No.2

U Thein Soe, General Manager

PAGAN

Laquerware Training School

U Thaug Tun, Principal

PALEIK

Textile Mill

U Thein Tan, General Manager

MANDALAY

Sein Ban Industrial Co-operative

U Hla Shein, President
U Kyaw Sein, Secretary
U Nyein Maung, Asst. Secretary
U Pu, Member
U Tun Aye, Member
U Hla Saung, Member
U Win Thein, Member
Capt. Aung Phyu, Division Head
Daw Betty Kyaw Than, Deputy Division Head

U Ba Saw & Brothers (Foundry shop)

U Tun Aye, Owner

Mandalay Beer Factory

U Win Myint, General Manager
U Thaung Myint, Brewer
U Khin Maung, Distiller
U Kyaw Than, Asst. Manager (Admin)
U Than Sein, Head of Office

U Taw Taw & Sons (Marble works)

FIELD TRIP TO SYRIAM, 26/6/89

Garment Factory No.(3), Syriam

U Than Tun Oo, General Manager
Daw Aye Kyi Kyi, Deputy General Manager
Daw Aye Tint, Account Officer

Packaging Factory No.(2)

U Nyan Tun, Factory Manager
U Kan Myint, Asst. Factory Manager

Footwear Factory No.(2)

U Thaung Nyunt, General Manager
U Myat Kyaw, Head of Department (Admin)
U Aung Than, Head of Branch (Admin)

Glass Factory

U Nay Win, General Manager
U Aye Thein, Asst. General Manager
U Sein Wine, Project Manager
U Kyi Win, Head of Department (Admin)
U Nyunt Shwe, Head of Department (Production)
U Win Pe, Head of Department (Planning)
U Hla Thein, Head of Department (Finance)

Industrial Training Centre No.(1)

U Aung Myint, Principal
U Khin Maung Tar, Deputy Principal
U Myat Thu, Head of Training Plant Department
U Tin Myint, head of Theory Department (Mechanical)
U Aung Gyi, Head of Theory Department (Electrical)

Myanma Petrochemical Enterprise (Refinery Plant)

U Maung Maung Myint, General Manager
U Than Htay, Deputy General Manager (Engineering)
U Tun Win, Deputy General Manager (Production)
U Saw Maung, Superintending Engineer
U Win Pe Han, Head of Technical School

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