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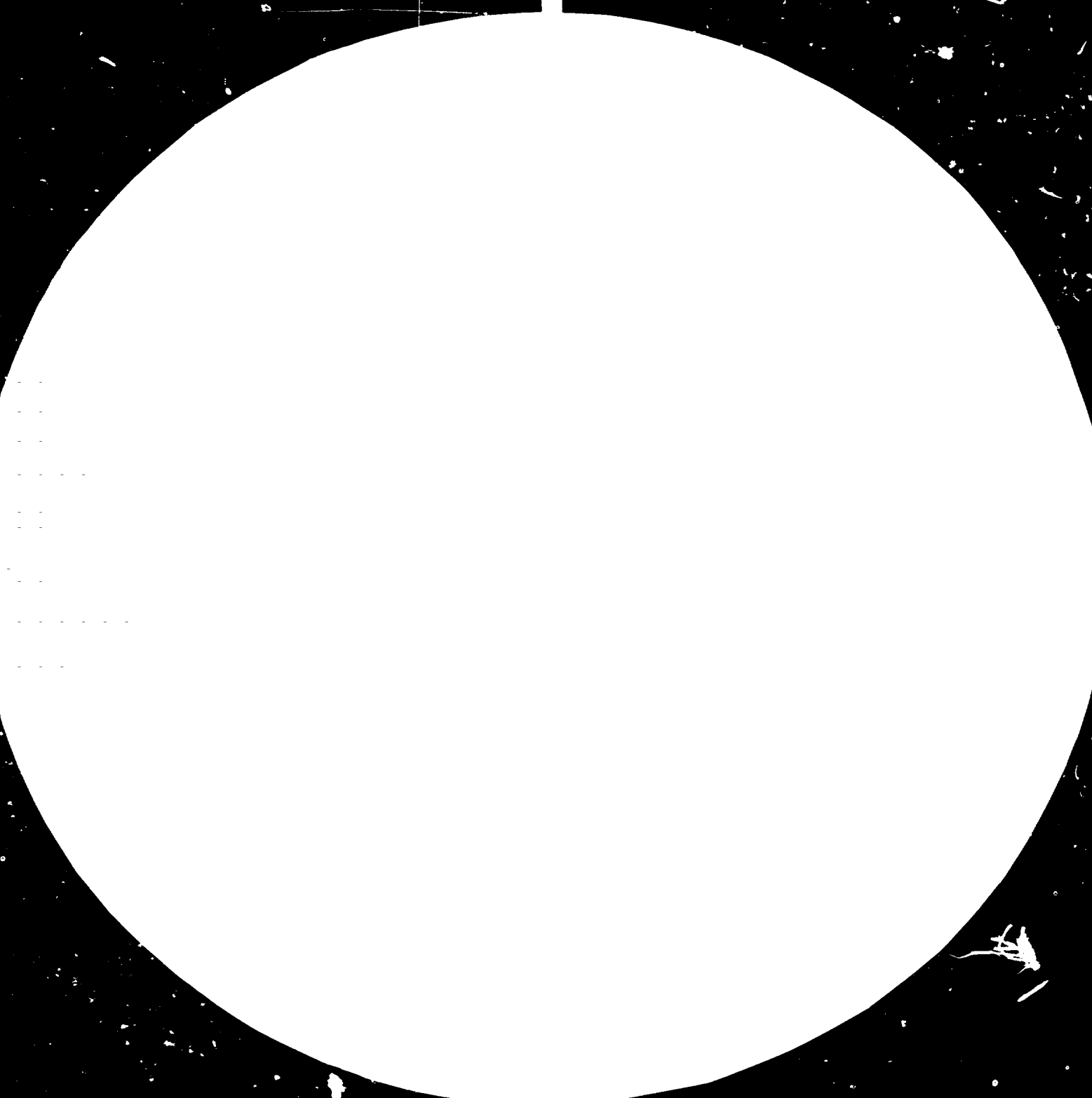
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Workshop on Selection of Technology for
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Utrecht, The Netherlands, 4 - 8 May 1981

FINDINGS OF WORKING GROUP I*

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I. Background and Introduction

This report was prepared by a Group of Experts as part of the role playing exercise which was carried out at the Workshop. The group examined a "Suppliers Technical Proposal for the Establishment of a TV Plant" which had been prepared for the Workshop. Discussions were then held with representatives of the suppliers and a TV assembly plant was selected by the Group suitable for the country with a large internal market as detailed in Appendix I. The findings of the Working Group were presented to the Plenary Session of the Workshop and the following text was prepared as working document to support the verbal presentation.

II. Main findings

Population and demand.

As it is indicated in the general country data, the number of inhabitants is 66.9 million persons. This number can create a market for 2 million sets/year. This number can be classified as follows:

total number	2.000.000 sets
colour TV sets	800.000 sets
black & white	1.200.000 sets

We assume that the market will be supplied through imports by 400 K units black & white and the rest of 800 K units will be made or assembled locally. It is believed that a 25% of market requirements can be covered by the new assembly line equivalent to 300.000 units/year.

The demand is related to other factors as follows:

$$\text{demand} = K \times \frac{\text{population} \times \text{purchase power}}{\text{price of product}}$$

$$\text{or } D = K \times \frac{P1 \times P2}{P3}$$

where

D = demand in number of sets

P1 = population in millions

P2 = purchase power

P3 = price of product in US dollars

K = constant (determined by factors such as members/family, units/family, lifetime of sets, etc.)

Purchase power and price of product.

As stipulated in the G.C.D. the wages start at 4.285 p/month which is equal to 200 US dollars. Compared with the cost price indicated in the proposal which is equal to 136 ex factory at a rate of 200 K units/year, the cost is practically within the reach of any person in the country.

Alternative suppliers.

Although it is not listed in the G.C.D. that there is electronic industry activity but other factors explain possibilities and fertile environments for the establishment of such industry. It was stated that 7000 licensing agreements are already concluded with foreign enterprises. It is assumed that 400 K units will be supplied to the market through other manufacturers.

Forecasting market conditions.

Due to the fact that the purchase power exists in the market there will be a natural tendency within the consumers to switch to colour TV sets. This fact is supported by other technical limitations in the continuous production of B & W picture tubes and accessories. The prices of colour TV sets in the international market decreases by time even with the existing rate of inflation.

Manpower.

The proposal includes the requirements of 132 persons for current technology while 194 persons will be required for simplified technology. The G.C.D. indicates in the part of labour resources 27 % of the population as active population. This complies with the requirements of the proposal including skills and crafts. It should be taken in consideration the establishment of a training centre with necessary facilities of the purpose of upgrading the workers knowledge. No indication of such training facilities exists locally.

Wages.

The rate of wages within country complies within the figures indicated in the project.

Management.

Bearing in mind the great importance of modern management and capabilities required to run such a plant it is necessary to train the expected managers in the suppliers plants, to ensure the high standard of the future managers of the plant. Periods of training and subjects to be concerned must be clearly indicated in the proposal.

Qualifications required are basically available.

Material requirements.

Availability.

By careful examination of the component list included in the proposal taking in consideration the existing industry which was listed in the G.C.D., it is clear that the local market will be able to supply components and materials comprising 46% of the costs of the component list.

This will comply with the national interest of indigenization and will affect the cost of the unit favourably. The expected increase in the cost of production equipment will not be significant.

Quality x price stability.

The proposal did not take in consideration the possibility to supply components and materials from the local market. Quality control group and necessary test equipment must be added to the costs of the project.

One year contract with local suppliers of components is considered safe enough to ensure stability of prices.

The local supplier has to guarantee the supply of necessary components in time and quantity and quality taking in consideration the time required as lead time.

Restrictions and importation.

Custom duties are low on essential goods, prohibitive on products competing with local industries. This in connection the open door to foreign investments will create the suitable environments for the project.

Know how.

1. The group agrees to the simplified technology methods due to the following reasons.
 1. Low starting cost of the equipment.
 2. Low wages and availability of manpower.
 3. Simplified machines need less maintenance cost and can be maintained by normal level of skilled labour.
 4. Simplified machines give more flexibility in production lines thus giving chance for alternative products in the future.
 5. It is noted that there is no significant increase in the requirements of labour compared to the current technology methods.
 6. The plant area is similar in the two cases.

2. The simplified technology selected will be needed for the start-up time, calculated to be 3 years, more automated equipment according the latest current technology will be introduced to the plant to improve productivity and increase profit, provided that the level of the technical staff is high enough to receive and understand this modern technology. The new machines will be then financed from the expected plant profit.

Imported or local technology.

No evidence is observed to prove availability of local, technical, know-how in G.C.D. This imported technology has to be considered (referred to know-how paragraph) simplified technology is already selected.

Infra structure.

The infra structure of the country is found quite encouraging. This includes roads, rail, port, airports, telephones, public transport facilities, social facilities, health care, cultural life, training and education.

Government Policies.

The proposal did not include enough details in the chapter for agreement. Although it is clear from the G.C.D. the following:

1. The country is open to foreign investments with contribution up to 49 per cent of the equity.
2. Profit repatriation possible and guaranteed.
3. Capital and royalty possible and guaranteed.
4. Convertibility guaranteed.
5. But in the field of taxation, there will be no discrimination between foreign and local investment which is 42 per cent.

The government must be assured that the price of the same product will be cheaper than the existing production price of alternative suppliers - indigenization is a general policy of the country whenever possible.

Issues to be considered in the technology transfer.

1. The proposal did not include a list of the proposed machines. It must be taken into consideration the possibility to use locally manufactured machines if available.
2. Factors affecting the selection of technology can be as follows:

The selection of technology of the product must comply with the general interests of the country and its necessities as it reflects to the internal market promotion.

- a. Complexity of machines required
- b. Maintainability of machines
- c. Spares availability
- d. Availability of skilled manpower
- e. Product quality expected
- f. Permissible rate of rejection
- g. Limitations imposed by the existing infra structure and manpower characteristics and weather conditions
- h. Production volume decided according to market study
- i. Rate of energy consumption/unit
- j. Wages.

The wages indicated in the proposal are within the limits of the actual wages of markets as stated in the G.C.D. which is 200 US dollars per month.

- k. The technology suppliers must permit the national experts to visit and recognise the process and know-how prior to negotiations.

It is found necessary in return that the contract be negotiated in the host country.

- l. The technology supplied must not limit possibilities of exportation of the locally assembled units.

It is clear from the G.C.D. report that the country is in a good financial position to support such a proposal.

WORKING GROUP I

ITEM	PROPOSAL	COUNTERPROPOSAL
1. volume	200 K	300 K
2. cost (trans price)	136 \$	should be recalculated considering local manufacturing of parts, components etc., low wages
3. local materials components	none in the analysis of costs	
4. process technology	simplified	simplified
5. imported components	12 \$	33 \$ imp. (tube + tuner + s.c. + res. + cap. + misc.) and 39 \$ local (wires, fixed mats. packing mats., defl.unit, coils, L.S. + TX me-s, PCB, metal parts, cabinet
6. process and techn. for local manufacture of comp.	no	should be provided

not complete

CHOOSING PROCESS (ASS'Y) TECHNOLOGY

<u>Item</u>	<u>Simple</u>
EMPLOYMENT	X
QUALITY	
OPER. COST	
INVEST; COST	X
VOLATILE PRODUCT TECH.	X
APPLIC. OF UNIV. TECH.	
MAINT.	X
VOLATILE PROC. TECH.	X

(Not complete)

WORKING GROUP 1

Current

X

X

X

U N I D O

INDUSTRIAL INVESTMENT PROFILE

GENERAL COUNTRY DATA

Surface area	: 1,972,547	sq km
Population	: number (year)	: 66,900,000 (estim. 1978)
	: density	: 34 per sq km
	: growth rate/year	: 3.5 % (1970-1978)
Climate	: mountain climate, dry and warm	
Language(s)	: Spanish, English	
Religion(s)	: Roman Catholic	
	Inhabitants	: 11,339,744 (1976)
Currency	: Peso (P)	Exchange rate : US \$ 1 = P 22.840 (06.1979)

GENERAL ECONOMIC PROFILE

DISTRIBUTION OF GDP (bln P)

	1976	1978	1977
Consumption	780.1	950.9	1,308.9
Investment	242.6	280.6	333.6
Exports	75.8	104.1	167.6
- Imports	- 76.0	- 124.8	- 169.6
TOTAL GDP at current prices	1,032.4	1,220.8	1,639.6
PER CAPITA GDP at current prices	P 16,640	18,580	26,383
Average real growth rate	:		

SECTORAL ORIGIN OF GDP (%)

	1976	1978	1977
Agriculture	10	10	10
Mining	1	1	1
Manufacturing	26	27	38
Others	63	62	51

BALANCE OF PAYMENTS (bln P)

	1976	1978	1977
Inflows	149.1	199.1	283.0
- Outflows	- 147.1	- 213.0	- 269.1
Net change in international reserves:	2.0	- 13.9	14.7

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ANNEX 1

LARGE INTERNAL MARKET

COMPARATIVE MANUFACTURING ADVANTAGES

Resources	- natural	: petroleum, natural gas, salt, iron ore, silver, coffee nutmeg, livestock, rock phosphates.
	- labour	: 37 % active population (1978).
	- financial	: , official banks for agric., for. trade
Infrastructure	- transport	: 6 airports, 28 int. airports, good road and rail etc..
	- energy	: 65 bin (Wh); 45 mln m.t. oil refined; mol. plant networks
	- development institutions	: National Foreign Investment Commission ; Foreign Trade Institute.
Inflation rate (year)		: 17.6 % (1978).
Main manufacturing branches		: food processing, engineering industries, petrochemicals, textiles.
(Summary of chapter III)		

FOREIGN INVESTMENT POLICY

Open to foreign investment (branches ; preferences)		: yes, for. investn. welcome as a supplement to local inv. in sectors introducing new technol., those which are export-oriented and which utilize local raw materials.
Allowed proportion of foreign capital		: up to 49 % unless otherwise specified.
Investment incentives		
Legal	- investment code/law	: 1973 Nat. Concession on Foreign Investment
	- profit repatriation	: guaranteed
	- capital repatriation	: guaranteed
	- others	: ..
Fiscal	- corporate income tax	: ..
	- other corporate taxes	: stamp tax ; mercantile tax
	- tax holiday/reduction	: 40%/income tax; 100%/merc. stamp taxes
	- carry forward of losses	: ..
	- tariff reduction	: 100%/equipment, raw materials
	- double taxation avoidance	: with USA on shipping/aircraft operations
	- others	: 100% exemption/export taxic
Financial	- borrowing incentives	: ..
	- others	: numerous from abroad
Membership in international and regional economic organizations/institutions		: United Nations, ECLA, The World Bank, IMF, IDB, LAFTA.
(Summary of chapters I and II)		

I - GOVERNMENT ECONOMIC POLICY

Politico-economic system : market economy country ; key sectors are nationalized (energy, mining, communication, basic petrochemicals).

Membership in international and regional economic organizations/institutions : United Nations, SCLA, The World Bank, IMF, IDB, LAFTA.

Monetary policy (convertibility and controls ; membership in currency unions) : official intervention, when necessary, to maintain orderly conditions in the exchange market ; exchange rates determined by demand and supply on exchange market. Settlements with other Latin-American countries are made through clearing accounts (LAFTA agreement).

		1976	1977	1978
Currency	: Exchange rate : US \$ 1.00 = P :	15.426	22.573	22.767
<u>Foreign trade</u>	: Total imports (SITC 0-9) :	90,900	124,094	161,854
	Thereof manufactured goods (SITC 5-8) :	74,801
	mainly : machinery and transport material	46,436
	: Total exports (SITC 0-9) :	53,517	94,140	129,589
	Thereof manufactured goods (SITC 5-8) :	17,637
	mainly : crude petroleum	8,396	20,168	..
<u>Foreign investment</u>	: Inflow of direct foreign investment :	3,383	7,368	6,104
	Thereof manufacturing sector :		..	
<u>National budget</u>	: Total expenditures (-) :		..	
	: Total receipts (+) :			
	: Balance (+ or -) :			
	: Public debt	DOM :		
	FOR :			

(mln F)

Economic development : Economic activity centered on : petroleum, natural gas and phosphates production and processing

Development strategy oriented towards : export promotion, regional development, State development of key sectors

Current nat. dev. plan : duration : .. years, from to

Total plan budget : DOM : .. FOR :

II - REGULATIONS ON PRIVATE AND PUBLIC FOREIGN INVESTMENT

Object	Instruments	Content
<u>Eligibility</u>	1973 National Concession on Foreign Investment. National Registry of For. Investment.	<p><u>Fundamental policy</u> : foreign investment is welcome as a supplement to local investment. Mixed economy.</p> <p><u>Eligibility criteria</u> : certain sectors are under State control, e.g. energy, communications, mining, petrochemicals. Those open to foreign investment include new technology or export-oriented industries, as well as those utilizing a high percentage of raw materials.</p> <p><u>Foreign loans</u> : subject to approval by the Ministry of Finance and Public Credit and the Bank</p>
<u>Corporate status</u>		<p><u>Type of corporation</u> : no restrictions.</p> <p><u>Minimum capital</u> : ..</p> <p><u>Allowed foreign participation</u> : up to 49 % ; more in exceptional instances.</p> <p><u>Minimum participation of local partners</u> : see above. Certain industries are exclusively reserved for Mexican private and/or public capital, such as media, transport, forestry operations, gas distribution.</p>
<u>Registration</u>		<p><u>Application</u> : informal approval of the Directorate General of Industries is a prerequisite to formal permission from the National Commission on Foreign Investment.</p> <p><u>Time span of decision</u> : no provision.</p>
<u>Financial transfers</u>		<p><u>Profit</u> : repatriation guaranteed.</p> <p><u>Capital</u> : repatriation guaranteed.</p> <p><u>Loans (principal and interest)</u> : repatriation guaranteed.</p> <p><u>Technology (fees and royalties on licenses, consultancy, management)</u> : remittance unrestricted.</p> <p><u>Convertibility</u> : guaranteed to approved investments. The US \$ is the intervention currency.</p>
<u>Technology transfers</u>		<p><u>Control</u> : there are no exchange controls.</p> <p><u>Protection of industrial property</u> : no agreements concluded to date.</p> <p><u>Licensing agreements</u> : more than 7,000 technology agreements concluded with foreign enterprises.</p>
<u>Labour</u>		<p><u>Patents and trademarks</u> : ..</p> <p><u>Wages</u> : 4,285 P/month (1976).</p> <p><u>Working hours</u> : 45.8/week (1975).</p> <p><u>Social benefits</u> : ..</p> <p><u>Labour disputes</u> : ..</p> <p><u>Foreign labour</u> : an entry permit, either immigrant or non-immigrant, depending on the business, is required. It must be obtained from the Ministry of the Interior.</p>

III - COMPARATIVE ADVANTAGES OF THE MANUFACTURING SECTOR

Natural resources endowment : petroleum, natural gas, salt, iron ore, silver, copper, phosphates, sulphur, zinc, coal, livestock, sugar, corn, coffee, cocoa.

Labour resources : Active population : 27 % (manufacturing 20 %; agriculture 39 %). Un/underemployment 3 % (1978)
 Available skills : .. (% of active population - ISCO classification)
 O&I technical: %; 2 admin.: %; 3 clerical: %; 4 commerc.: %; 7&9 manual: %
 Working hours/week: 45.6 (1976) Annual holidays: .. days

Average worker earn. by hour (H), day (D), week (W) or month (M) in manufacturing : 4,285 P/M (1976)
Financial resources : Bank (Central Bank), official banks for every sector of economic activity. First National City Bank.

Market orientation/potential : expansion of key public sectors ; regional development ; exportation.

Infrastructure : Transport : railways : 40 000km normal gauge - Seaports 4 large ones
 roads : 187,000km hard surface - Airports : 28 intern., 16 medium-s., 500 small internal
 Telecommunications : 3.7 mln(??) tel. lines - 7,470(1977) telex lines
 Energy : electr. : capacity 12,847 (1978) 1,000 kW - production 55,200 (1978) mln kWh
 oil : reserves 1,127 (1978) mln m.t. - production 63,000 (1978) 1,000 m.t.
 refining capacity 48,000 (1977) 1,000 m.t.
 nat. gas : reserves 840 bln c.m. - production 21,000 (1977) mln c.m.
 Development institutions : National Foreign Investment Commission, Foreign Trade Institute,
 Free zones.

Cost of living :

Consumer price index : (base 1975 = 100) :
 Wholesale price ind. : (base 1975 = 100) :
 Inflation rate :

	1976	1977	1978
Consumer price index	115.1	148.5	174.5
Wholesale price ind.	122.3	172.6	199.8
Inflation rate	15.1 %	29.0 %	17.5 %

Structure of manufacturing sector : (1977)

Branch - ISIC class.	number of establishments	gross investm. bln P (1975)	employment 1,000	salaries bln P	output value bln P	value added bln P (1975)
31 food and beverage	489	1.5	120.0	7.9	23.3	21.0
32 textile	139	0.4	55.5	3.7	17.5	4.7
33 wood	18	..	5.5	0.3	1.7	0.5
34 paper	97	0.7	27.2	2.4	18.5	4.6
35 chemicals	217	2.1	75.7	7.4	59.5	15.1
36 mineral products	67	1.9	37.0	3.4	19.3	5.4
37 basic metals	112	0.9	66.7	5.4	60.0	12.0
38 machinery	176	1.1	99.8	8.5	68.5	14.0
39 others	-	-	-	-	-	-

