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THE MACHINE TOOL INDUSTRY IN PAKISTAN 1/

by

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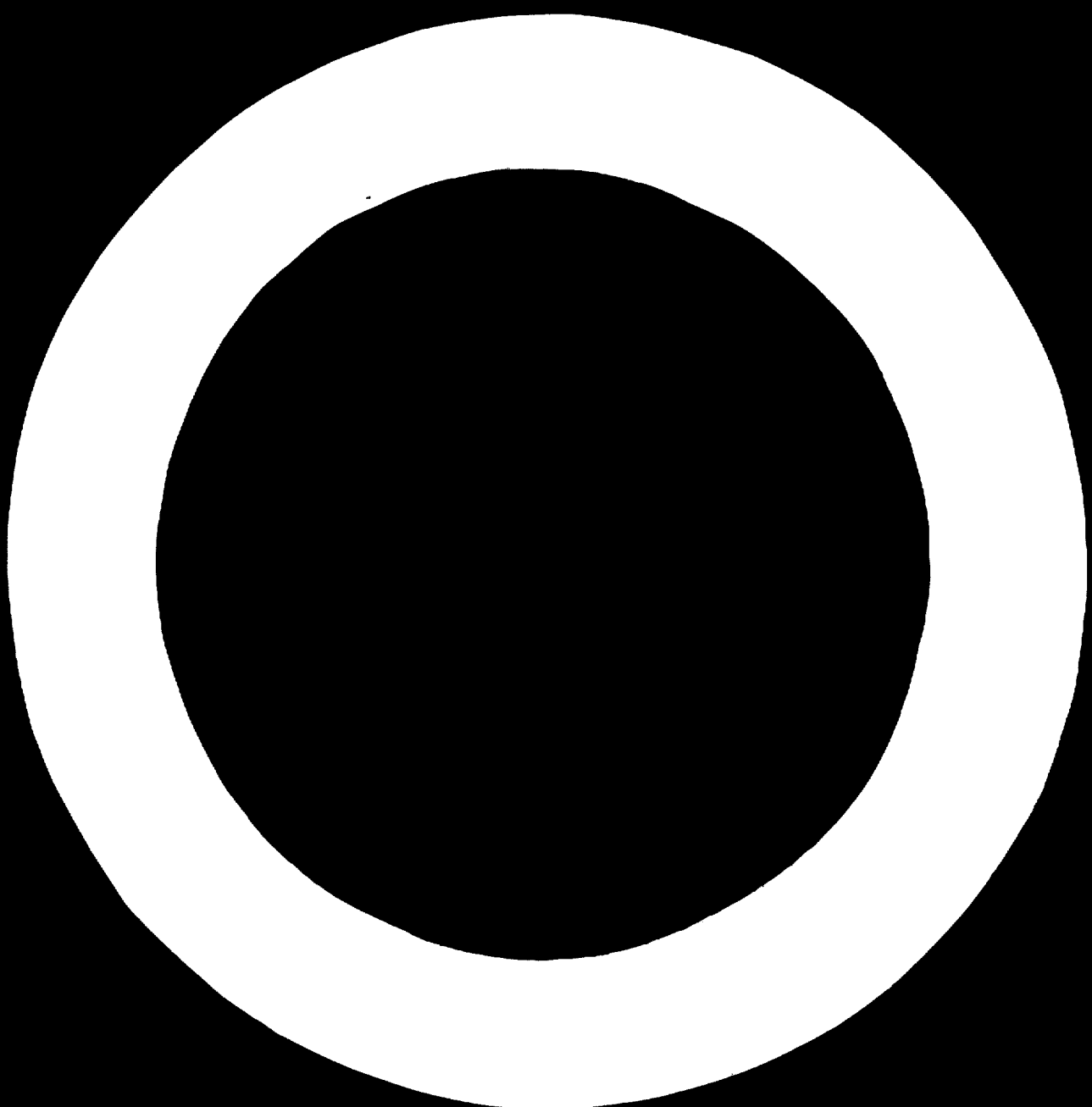

C O N T E N T S

Appendices

P r e f a c e

This report on "status of machine tool Industry" in Pakistan is based on a questionnaire prepared by Mr. K. Gobrial, UNIDO Expert who visited Pakistan on 20th March 1971 in connection with a Seminar on this subject to be held in U.S.S.R.

Outlines of the questionnaire are reproduced below :

Brief survey of industrial structure

- Mixed economy

  Government recently established a number of state owned corporations controlling important sectors of the economy.

- The private sector of industry also incorporates a number of relatively small companies producing machine tools.

Statistics

- Tables of Production and imports for past 5 years and projections for 1975, 1980 and 1985.
- Include if available, metal working Industry figures for past 5 years and projections as above.
- If available give total figures for machine tools in use in the country and projections.

Summary of facilities and services

- Brief details of laboratory and test facilities available at PITF.
- Training Programmes particularly applicable to machine tool manufacture.
- The function of PITAC.
- The established use of N.C. machines
- Supporting industry resources within the country.
- Government Policy to encourage use of locally built machines.
- Export of machines
- Ways and means by which this is achieved.

Technical Assistance

- Areas for assistance by UNIDO
- Other forms of assistance.

Future Policy

- Types of machine tools to be introduced
- Development of export markets
- Other relevant factors.

1) **Brief history of machine tool industry**

Pakistan inherited a very small and meagre machine tool industry on its establishment in August, 1947. Most of the industry consisted of small,un-economic and unscientific units engaged in the production of elementry forms of machine tools driven by overhead shaft belt drives and consisting mostly of centre lathes, drills and planers.

The first serious attempt to introduce a scientific production of machine tools in Pakistan dates back to 1950 when a small private unit located at Lahore named Batala Engineering Company Ltd. (BECO) was able to set up relatively modern engineering plant based on the machine tools obtained from the famous German plant Machine Tool Works- "Wagner" of Dortmund. This company also procured the services of 12 German engineers and technicians belonging to this plant and was able to introduce the production of independently driven all geared centre lathes, drills, shaping machines and hacksaw on modern basis.

The lead given by BECO was followed by other small manufacturing concerns also and new factories based on imported machine tools soon started making all geared centre lathe in a range of centre height from 100 mm to 500 mm and centre range betwen 500 mm to 3000 mm.

Besides the classical machine tools, the production of power presses was also established in Pakistan and today power presses in the range of 5 ton - 100 ton, and guillotine shears in the range of 1 meter to 3 meter length (2 h.p. to 10 h.p) are now available in the market.

In 1962 the Pakistan Government started to set up heavy industry in the public sector. Recognising that the setting up of a machine tool industry was an essential pre-requisite to the introduction of heavy industry, it decided to start with the setting up of a machine tool factory in the public sector. The planning work of Pakistan Machine Tool Factory (PMTF) was entrusted to the famous machine tool manufacturers in Europe Messrs. Buhrle & Co, Zurich, Switzerland. PMTF was equipped with the most modern machinery acquired from Switzerland, France and Italy. The initial programme of PMTF in the field of machine tools consisted of 2 types of Milling machines and one type of turret lathe based on licenses obtained from Oerlikon (Switzerland) and Alfred Herbert (England) respectively. This factory started production in November, 1968. With the establishment of Pakistan Machine Tool Factory, the country was able to produce a vast range of conventional machine tools such as centre lathes, turret lathes, shapers, drilling machines, planning machines, hacksaws, power presses etc. The only notable exception is the grinding machines which are not being produced by any firm at present excepting very small number of cylindrical grinding machines produced by a small firm at Lahore.

It is assessed that there are over 70 machine tool manufacturing units in Pakistan, two of which employ more than 1000 workers, about 5 employ between 100-500 workers and the rest are small private units employing less than 100 workers.

2) Organisational set up of machine tool industry

Until 1971 the entire machine tool industry in Pakistan excepting the Pakistan Machine Tool Factory at Karachi, was in the private sector. In 1971 the Pakistan Government, following a programme of revolutionary economic reforms took over a number of basic industrial units in the private sector and integrated them in various public sector corporations. Today the major machine tool manufacturing units come under the control of 2 state organisations, namely,

1) State Heavy Engineering & Machine Tool Corporation Ltd.

This Corporation comprises of:

a) Pakistan Machine Tool Factory, Karachi - described above.

b) The Heavy Mechanical Complex at Taxila, engaged in fabrication of equipment for cement factories, sugar mills and road rollers etc.

c) The Heavy Foundry & Forge, Taxila, now under erection.

d) Peoples Steel Mill, Karachi, an alloy steel producing plant taken over from the private sector. This unit has started production recently.

2) State Light Engineering Corporation

This includes the following units taken over from private sector.

a) Messrs. Batala Engineering Co. (BECO), Lahore mentioned above, now renamed as Pakistan Engineering Co. Ltd. (PECO).

b) Messrs. Ittefaq Foundry & Works Ltd., Lahore: also manufacturing machine tools amongst other products (now renamed "Lahore Engineering & Foundry Co.) - LEFO.

c) Messrs. M.F. Foundry & Engineering Works Ltd.

The inclusion of cast iron foundries/steel plants in these two corporations enables the machine tool units of these Corporations to meet their requirement of castings and alloy steel from within the public sector.

The role of public and private sector industries engaged in the production of machine tools has now been defined clearly. The public sector industry is to engage itself in the production of sophisticated machine tools which require more developmental efforts and give slow return on capital investment. Such machines include precision centre lathes, turret lathes, Capstan lathes, milling machines, grinding machines, boring machines, radial drilling machines etc. The private sector industry on the other hand is free to operate in the following fields:

a) Production of centre lathes, bench lathes, shaping machines, planers, drilling machines, hacksaws, power presses and other sheet metal working machines etc.

b) Sub-contracting work for public sector machine tool industry e.g. for manufacturing accessories of milling machines and tooling for turret lathes etc.

c) Diverting some of their capacity in manufacturing cutting tools like turning tools, milling cutters, twist drills etc. and holding devices such as chucks, collets tool-holders etc.

3) <u>Present installed capacity of machine tools</u>

The annual production capacity of major plants engaged in machine tool production can be assessed as follows:

1) a) <u>Pakistan Machine Tool Factory</u>

Ultimate installed capacity - 350 machine tools per year

Break up :

Milling Machines - 250 per year

Turret lathe >40 mm ∅ - 50 per year

Diverse special machine tools and special executions - 20

b) Pakistan Engineering Co.

Ultimate installed capacity : 680 machines per year

Break Up:

Centre lathes	-	400
Turret lathes <25 mm ∅	-	20
Milling machines	-	135
Shaping machines	-	70
Hacksaw machines	-	55

Annual capacity of other machine tool units (assessed)

Centre lathes	-	2000
Drilling machines	-	1300
Shaping and planing machines	-	30
Grinding machines	-	10
Power presses & other sheet metal working machines	-	30

The pattern of annual installed capacity can therefore be summarised as follows:

Centre lathes	-	2400
Turret lathes	-	100
Milling machines	-	250
Drilling machines	-	1435
Shapers and planers	-	100
Grinding machines	-	10
Power presses and other sheet metal working machines	-	30
Hacksaws	-	55

4) Pattern of present and future demand in Pakistan

In a developing country like Pakistan it is very difficult to assess the demand of pattern of machine tools accurately. The only figures available through the Central Statistical Office are those of yearly imports, which however, do not reflect the actual demand because the import at any time are largely dependent on the import policy, availability of loans and the taxation policy of the Government from time to time. Even these figures have not been classified properly according to the nature of machines. These statistics can therefore be taken as approximations only.

The total number of machine tools produced, imported and exported for years 1965-66 to 1972-73 is given in the appendix I. The total demand of machine tools has been calculated as follows :

Total consumption in Pakistan = Number of machines tools imported) + (Number of machine tools produced in the country) - (Number of machine tools exported).
It would be noticed that there is gradual decrease in the total demand so calculated from the year 1968-69 to 1971-72 which coincides with the period of an economic slump in Pakistan. The decline in the demand of machine tools seems to have been arrested in the year 1971-72 following the introduction of economical reforms by the Pakistan Government and there is now a clear indication of a steady growth.

The future demand of the country can be assessed only in the light of Government policies which foresee an annual growth rate of 10% in the industrial sector. In fact this growth is clearly visible in the large scale manufacturing sectors in the year 1973-74. It can therefore be assumed that the demand of machine tools will at leaast be double by 1979-80 as against the actual demand of 1971-72 given in the Appendix I . The performance of HMTP alone can be seen in AppendixII.

As these Appendices indicate, the country is expected to remain self-sufficient in the field of centre lathes, turret lathes, milling machines, shapers, planers, drilling machines and power presses of all the types the description now being made in Pakistan, still leaving a small surplus for export.

It is very likely that the demand of machine tools may go much beyond these figures because of the ambitious Government plans to set up specialised plants for the progressive manufacture of automotive vehicles including tractors, trucks, buses, cars, jeeps, auto cycles etc. in Pakistan by the year 1979/80.

5) Present installed machine partking in the country .

The total number of machine tools installed in the engineering work of Pakistan calculated by updating a survey conducted by Messrs. Moskwill of UK in 1968 is as follows :

No. of employees	Estimated No. of Companies/Firms	Estimated No. of metal cutting machines	Estimated metal forming machines
Over 1000	4	1500	100
Over 50	200	6200	2700
10 to 49	700	5800	1500
under 10	800	2600	80
		16,100	5,100

Most of the machines installed in these units are of conventional type. Some of the newly set up units have already installed a number of numerical and programme controlled machines with either punch card or plug board control. The number of such machines, however, hardly exceeds 50. In fact, the very concept of numerically controlled machines for small series of repetetive jobs has still to get its roots in Pakistan, so that the local production of such machines is not commercially feasible and economically viable at present.

With the growth of progressive manufacture of automotive vehicles in line with the Government policy, the requirement of sophisticated machine tools, including machining centres, automatic tool loading devices etc. will become greater and the machine tool industry of Pakistan would have to introduce such machines in their production programme gradually.

5) Growth of ancillary activities for the proper development of machine tool industry in any country.

It is imperative that the ancillary activities of machine design, material inspection, quality control, production planning, production control, tool jig and fixtures design and tool jig and fixture production are also developed simultaneously. Unfortunately these concepts have not been developed fully in the private industry and the public sector industry will have to lead the private industry in this respect. That the planners of this country have fully realized this situation is apparent from the incorporation of these concepts in the Pakistan Machine Tool Factory, some of which are enlisted below :

a) Machine Design

Machine design is all done according to the latest design concepts e.g. unit block construction, use of repeated units, increased application of standard parts, use of geometrical series in speed, feed and power ranges etc. An elaborate system of standardisation has been evolved for use throughout the factory, details of which are contained in the Enclosure "A".

b) Production Planning

The production planning is based on part classification system according to the key evolved by Dr. Opitz. Standard master layouts are made for every part group and the production planning of each of the actual component is done according to the standard layout as far as possible. The production control is based on MTFA system time evaluation.

c) Material Control

Elaborate facilities of material control allows the analysis of material from physical, chemical and metallographical point of view. Spectrographic Equipment enables quick and dependable analysis of engineering alloys. Ultrasonic and magnaflex facilities allow a non-destructive crack detection. These facilities help in maintaining strictest standards of material and production.

d) Inspection and Quality Control

The concept of inspection and quality control has been built in the factory organisation. Each component is inspected at various levels of production and entire assembly product is then inspected according to the latest "Schlesinger Machine Tool Testing Standards". Some of the "Test Standards" may be seen in the Enclosure "B".

e) Tool Design

The Tool Design Department is also working according to the part group system, Specialised groups for designing of tools, jigs and fixtures falling in each of the part group have been formulated.

f) Production of tools, jigs and fixtures

A special workshop has been incorporated to manufacture all special toolings, jigs and fixtures. It is expected that after the production of necessary toolings and other production aids for the factory products have been accomplished, this workshop will be able to help the other industry for providing them the toolings, jigs and fixtures for their production also.

7) Training Programme

The development of skills both in actual production as well as in production starting activities such as design, production planning etc. are of utmost importance for the growth of machine tool industry. At present only the bigger concerns mostly falling in the public sector are following regular training programme for their staff and production shop and in design office. The total number of apprentices so trained per year in the specialised workshop hardly exceeds 500 per year. The training courses being followed in these specialised institutions are necessarily of short duration running for about 6 months, the rest of the training of workers takes place in the shop itself and it is estimated that worker reaches his optimum efficiency in about 2-3 years after working on the shop floor. A brief description of training scheme being followed in HMT may be seen in Enclosure "B".

In addition to the training institutions functioning within each industrial unit, the Government have set up specialised training institutions for imparting skills in various trades at managerial and higher supervisory level. Some of the institutions engaged in specialised training are:-

a) Pakistan Industrial & Technical Assistance Centre (PITAC) Lahore.

b) YMCA Technical Training Institute, Karachi.

c) Pak-German Technical Training Centre, Lahore.

d) Swedish-Pak Institute of Technology, Karachi.

e) Pak-Swiss Training Centre, Karachi.

f) West Pakistan Institute of Management, Karachi.

Detailed pamphlets of a, d, e and f, may be seen in enclosure "C".

The Government exercises control on the training schemes being followed by the industrial units both in private and public sector. The "Apprenticeship Ordinance" provides for compulsory training of apprentices for 3 years in 29 different trades and all factories are being gradually covered under this Ordinance.

8) <u>Ancillisry Industry</u>

The growth of machine tool industry is also dependent to a very extent on the growth of ancillary industry which is fairly well developed in Pakistan. In fact, only about 15% of parts (by value) like ball bearings, roller bearings, special oil seals etc. need to be imported for the local production of conventional machine tools.

A brief description of ancillary industries is given below:

8.1 Foundry Facilities

There is enough capacity available in all the industrial areas where the machine tool industry is located. The assessment made in the Industrial Investment Schedule 1970-75 foresees the production of Rs. 6.1 million in the larger and medium foundry and of about 3000 tons in the small foundries. This comes to a total production of about 6000 tons of cast iron casting per year. This output is sufficient to cater for the need of iron machine tool industry.

Most of the foundries located in big industrial centres are well equipped and well managed with good system of quality control and are fully capable of handling the requirement of machine tool industry. Experiments are under way to make nodular cast iron castings and some of the units already produce such castings with good results. Sophisticated techniques such as shell moulding and precision castings however are not presently available but they also do not play any appreciable part in the machine tool industry.

8.2 Forging Facilities

The total installed capacity for forgings in Pakistan is estimated to be over 40,000 tons per year. All the big units engaged in machine tool manufacture in the public sector have their own forging facilities. In addition, several small forging units exist which may make all forgings needed in machine tools. The Pakistan Machine Tool Factory has special vertical forging machines with numerically control to forge automatically all cylinderical forgings such as spindles, shafts, levers etc.

8.3 Standard Part Production

A number of small units are engaged in the manufacture of standard parts such as nut, bolts, washers, spacers, taper pints etc. The total installed capacity in respect of screws, nuts and bolts exceeds 10,000 tons per year. New specialised units for undertaking production of springs, spring washers etc. are already coming up and it is expected that there will be no dearth of such components in the immediate future.

8.4 Rubber and Plastic parts

Here also a number of small units are engaged in making such items as oil seels, washer, conduits etc. There are still some difficulties experienced for these units in offering materials of correct specifications. This however is being overcome gradually.

8.5 Electrical Industry

5 big units with foreign collaboration/participation are working in Pakistan meeting the entire needs of electrical motors and drives required in the machine tool industry. However there are still some difficulties in getting some specialised items like micro switches, brake motors fractional horse power motors, coolant pumps, lubrication pumps etc. This is largely due to the fact that the machine tool industry has not yet been able to give standardised demands of such units so that quantity of these items become commercially viable for manufacture in the Country.

8.6 Special units for making toolings, jigs and fixtures etc.

Although the large industrial units in public sector are fully equipped to make their own toolings, jigs and fixtures and other production aids, the small and medium industries cannot afford to have their independent facilities in this respect. The Government have set up specialised units under public sector devoted to the manufacture of dies, tooling, jigs, fixtures and other production aids. Two of the most renowned units in this respect are:-

a) Messrs. Pakistan Industrial & Technical Assistance Centre (PITAC) located at Lahore.

b) Pak-Swiss Training Centre, Karachi.

These centres are getting a number of orders from the private industries. There is however still a large scope for addition of more units in this particular field. Pamphlets for both of the above organisations may be seen in Enclosure "C".

9.0 Government regulations about Machine Tools

9.1 Custom-Duty on 'Finished Machine Tools'

Machine tools are generally subjected to a levy of custom-duty @ 20% ad. val. when imported into Pakistan. However, custom-duty at higher rate of 50% ad. val. is levied on the machines being produced by Public and Private Sectors, namely.

A. Lathes(Turning Machines)

i) of 3 feet to 15 feet bed length and height from 4 inches to 14 inches.

ii) Turret, of spindle up to and including bar size one inch, centre height 4½ inches and thread cutting and tapping capacity upto and including ¼ inch.....

B. Drilling Machines:

i) Pillar type upto and including 25 inches x 32 inches drilling capacity.

ii) Upright type up to and including 2 inches drilling capacity.

C. Shapping Machines:

Having a stroke not exceeding 18 inches

D. Grinding Machines:

Bench grinding machines fitted with motors of 50 cycles having RPM over 3000.....

E. Honing, polishing, tapping and punching machines other than those having multiple speed and revertable motors.

F. Accessories and parts suitable for use solely or principally with the machinery are subjected to custom-duty at the same rate as applicable to the basic machine.

9.2 CUSTOM DUTY ON RAW-MATERIALS AND COMPONENTS FOR USE IN THE INDIGENOUS MANUFACTURE OF MACHINE TOOLS.

The raw-materials and components imported for manufacture of machine tools in Pakistan are subjected to custom-duty at different rates as under:

i)	Non-ferrous materials	= 20% ad.val.
ii)	Alloy steels	= 20% "
iii)	Unalloyed steels(rods & bars).	= 20-40% ad.val.
iv)	Castings,forgings,and stampings.	= 20% ad. val.
v)	Standard parts, i.e.	
	- nuts, bolts, screws, washers.	= 50% ad.val.
	- springs	= 20% "
vi)	Bearings	= 10-20% "
vii)	Electrical items	= 20% "
viii)	Name plates	= 100% "

SALES TAX :

All machine tools and articles for use with them are totally exempt from payment of sales-tax when imported into Pakistan. However, in case of machine tools manufactured in Pakistan, Sales-tax is payable on the raw-materials from which such goods are produced or manufactured. The standard rate of sales-tax is 20%.

INCENTIVES ON EXPORTS:

1. As a general rule, custom-duty and sales-tax paid on raw-materials used for export production are re-imbursed by the Government.
2. There is no export duty on export of machine tools.
3. Credits:
   To promote the export of locally manufactured machinery, a scheme of financing and re-financing has been introduced by the State Bank of Pakistan, to provide pre-shipment and post-shipment finances.

IMPORT OF MACHINE TOOLS:

Machine tools are generally importable under barter against licences issued under Tools & Workshop Equipment. These barter-deals are generally concluded with East-European and Socialist countries. Machine tools imported from these East European countries are about 25% cheaper than the prevailing market prices in the Western world.

The Government of Pakistan are understood to have imposed ban on import of Milling Machine and Turret Lathes into Pakistan, in the Import Policy for July, 1974 to June, 1975, announced by the Government in July, 1974.

10.0 Foreign Collaboration for production of machine tools

All arrangements with foreign manufacturers in future should rather be in the form of an active collaboration, and not merely an arrangement for licensing involving down payments and royalties. The following steps are recommended:

a) The licensor should arrange for the production of economic batch quantities of components in Pakistan. If the quantities of any particular unit required in Pakistan are uneconomic, the licensor should place some of his demand for such units on the licensee so that on both sides the production is based on economic quantities. This procedure can be expanded gradually so that ultimately only the minimum possible components need to be imported from the licensor.

b) The licensor should be able to constantly improve and update the machine design/manufacturing techniques and should be obliged to keep the licensee abreast of such developments.

c) The licensor should positively encourage and even assist the licensee in export of finished machine tools.

11.0 Technical assistance required from UNIDO

a) Establishment of an industrial advisory centre in Pakistan to advise on the problems of design and manufacturing techniques specially on programme control and numerical controlled machines, automatic machines, machining centre etc. This centre should also keep all documentation service where the latest trends in design and production technology can always be ascertained.

b) Assistance in the establishment of market research cell to advise on the marketing possibilities of various types of machine tools in the international market and price structure prevailing in various countries.

c) establishment of machine tool research and development laboratory: This should be set up to assist the machine tool industry in the improvement of their product and introduction of new design techniques. It should be equipped properly to measure cutting forces, noise pattern to assess the performance of machine tools under varying load conditions. It should also afford research and development on hydraulic/pneumatic/electronic controls drives and controls and possibilities to introduce numerical controls.

d) Introduction of exchange programmes, long and short term scholarships and informative stays for medium and higher management level of Pakistani specialists in the machine tool industry of foreign countries.

e) Advisory services for the growth of standardization and increase of productivity in the machine tool industry of Pakistan.

11. Concluding remarks

The development of machine tool industry can be studied only as a part of development of engineering industry in country. In this context an extract of the report of special world bank mission which visited Pakistan in 1969-70 on the invitation of Government of Pakistan to study the problem of industrialisation is reproduced below:-

"Pakistan is fortunate in having already established a significant nucleus of an industry with substantial employment potential and good demand prospects both on the home market and abroad. This is the industry producing engineering goods. Its labour skill in the major location are excellent. Its product range is considerable, mostly in light engineering; simple machine tools, telecommunication equipment motors(including electric), transformers, switch-gear, surgical instruments, electronic products. Also produced are parts of textile, cement and sugar mill machinery, agricultural machinery and auto-motive parts. The proportion of domestically produced capital goods embodied in the existing stock of equipment of many industrial plants is impressive; also impressive is the statisfaction of many users with the serviceability and durability of machinery of local manufacture. The engineering industry has developed despite difficult conditions in the supply of raw materials and components and despite competition from imported products. In the late 1960s domestic industry supplied about one-fourth of the aggregate requirements for capital goods. When allowance is made for the value of

imported inputs, net domestic contribution to the aggregate supply of capital goods was one-eight.

The domestic market for engineering goods is large, about $ 0.5 billion, and will be increasing faster than aggregate income. World demand is huge. It has been growing rapidly throughout the postwar period and there is no reason why it should decelerate and thus far at least international trade has not been subject to restrictions. Consequently, the engineering sector could not only serve as a basis for successful import substitution over the next five to ten years, but could also, if properly organised and managed, generate large exports.

The problem is whether Pakistan can avoid mistakes commonly made in the development of the engineering sector and whether favourable conditions can be created for its efficient for its efficient growth. This problem is of particular importance in Pakistan because for the foreseeable future the engineering sector has to operate largely on the basis of imported inputs; and in view of the constraints on Pakistan's exports, the engineering sector has to be efficient enough to be able to export a part of its own production. This will not be easy; the only comparative advantage Pakistan has consists of cheap and mechanically inclined labour. Planning of the industry's growth and its management then assume critical significance".

The need for exporting heavy engineering products has become all the more relevant in the recent times, when Pakistan economy has been caught in the mechanism of un-qual

exchange through international trade. The prices of imported raw material are increasing at an astronomical rate. On the other hand the prices of our exports are pressed down by the importing countries to prices below the economic level. The availability and prices of raw materials are posing extremely difficult problems for the machine tool industry in Pakistan. To quote one example, the market prices of imported pig iron has gone up from 2000 rupees per ton to Rs. 5000/- per ton within the last 3 months. This price was Rs. 1000 per ton only 6 months ago. Any product based on this price structure cannot sell at internationally competitive prices when exported. It is therefore imperative that some system of assuring competitive prices of imported raw materials, their assured supply and their strict compliance to specification is devised to help the engineering industries in countries like Pakistan. This would be the greatest help which could be accorded by an international organisation like UNIDO.

APPENDIX - I

DEMAND OF MACHINE TOOLS IN PAKISTAN

Year	No. of machine tools produced	No.of machine tools imported	No. of machine tools exported	Demand
A. MILLING MACHINES				
1965-66	-	533	-	533
1966-67	-	245	-	245
1967-68	6	232	-	238
1968-69	21	146	-	167
1969-70	7	110	-	117
1970-71	11	70	-	81
1971-72	8	24	-	32
1972-73	50	22	2	70
1973-74	70	5	4	71
B. DRILLING MACHINES				
1965-66	112	1944	-	2056
1966-67	108	22312	-	22420
1967-68	57	4318	-	4375
1968-69	124	247	9	362
1969-70	119	282	3	398
1970-71	93	294	16	[illegible]
1971-72	61	94	2	[illegible]
1972-73	79	201	-	280
1973-74	67	-	-	-

APPENDIX - I

Contd..

	Year	No. of machine tools produced	No.of machine tools imported	No. of machine tools exported	Demand
C.	LATHES				
	1965-66	236	916	-	1152
	1966-67	224	389	3	1510
	1967-68	83	972	3	1052
	1968-69	401	194	15	600
	1969-70	400	161	17	544
	1970-71	278	46	18	306
	1971-72	118	84	74	128
	1972-73	205	84	60	229
	1973-74	137			
D.	GRINDING MACHINES				
	1965-66		5233	-	-
	1966-67		622		
	1967-68		562		
	1968-69		117	32	
	1969-70		148	11	
	1970-71		95	29	
	1971-72		125	10	
	1972-73		164	18	
	OTHER MACHINE TOOLS				
	1965-66		12269	-	
	1966-67		7775	-	
	1967-68		6603	-	
	1968-69		1180	12	
	1969-70		1839	33	
	1970-71		2884	46	
	1971-72		530	2	
	1972-73		250	32	

PAKISTAN MACHINE TOOL FACTORY
(PROJECT OF SME & MT CORPORATION)

VOLUME OF PRODUCTION / SALES

Commodities: (Milling Machines K4 3/5 HP + Milling Machines K6 5/7.5 HP + Turret Lathe (Semi-automatic) 4/6 HP)

(All figures in Million Rupees)

S. No.	Description	1970-71			1971-72			1972-73			1973-74			1974-75		
		Type	Qty	Rs. Mil. Amount	Type	Qty	Rs. Mil. Amount	Type	Qty	Rs. Mil. Amount	Type	Qty	Rs. Mil. Amount	Type	Qty	Rs. Mil. Amount.
1.	Total Demand in Pakistan.	K4 K6 T3C	Uncertain		K4 K6 T3C	Uncertain		K4 K6 T3C	Uncertain		K4 K6 T3C	Uncertain		K4 K6 T3C	Uncertain	
2.	Stock (Beginning of the year in PMTF.	K4	Nil	-	K4	4	0.072	K4	1	0.025	K4	34	1.190	K4	60	2.640
		K6	Nil	-	K6	1	0.056	K6	3	0.168	K6	15	0.975	K6	29	2.750
		T3C	Nil	-	T3C	12	0.456	T3C	3	0.144	T3C	10	0.560	T3C	2	0.150
3.	Production by PMTF.	K4	6	0.090	K4	1	0.022	K4	35	1.120	K4	50	2.000	K4	50	2.250
		K6	5	0.200	K6	5	0.288	K6	15	0.870	K6	20	1.700	K6	20	2.940
		T3C	11	0.385	T3C	3	0.120	T3C	10	0.480	T3C	Nil	Nil	T3C	15	1.875
4.	Total Supply by PMTF.	K4	6	0.108	K4	4	0.100	K4	2	0.070	K4	24	1.056	K4		
		K6	5	0.240	K6	4	0.224	K6	3	0.195	K6	6	0.570	K6		
		T3C	11	0.418	T3C	12	0.576	T3C	3	0.168	T3C	8	0.600	T3C		
5.	Imports (U.S.C.)	K4	Nil	Nil	K4	24	0.357	K4	13	0.337	K4	2	0.088	K4		
		K6	58	2.360	K6	Nil	Nil	K6	9	0.568	K6	3	0.48	K6		
		T3C	14	0.370	T3C	Nil	Nil	T3C	2	0.090	T3C	Nil	Nil	T3C		
6.	Total supply in Pakistan.	K4	6	0.100	K4	28	0.457	K4	15	0.407	K4	26	1.144	K4		
		K6	63	2.560	K6	4	0.224	K6	12	0.763	K6	9	1.050	K6		
		T3C	25	0.788	T3C	12	0.576	T3C	5	0.258	T3C	8	0.600	T3C		
7.	PMTF's Share of Market. (%age)	K4	100%		K4	14%		K4	13.3%		K4	92%		K4		
		K6	60%		K6	100%		K6	25%		K6	67%		K6		
		T3C	44%		T3C	100%		T3C	60%		T3C	100%		T3C		

Note:-

1) Production cycle of types of PMTF Machine-tools mentioned above ranges from 9-12 months.

2) Equipment accessories/tooling extra 20% of the cost of basic Milling Machines and Turret Lathes.

3) Demand uncertain, surplus will be exported at international prices and quality.

APPENDIX - III

Bibliography

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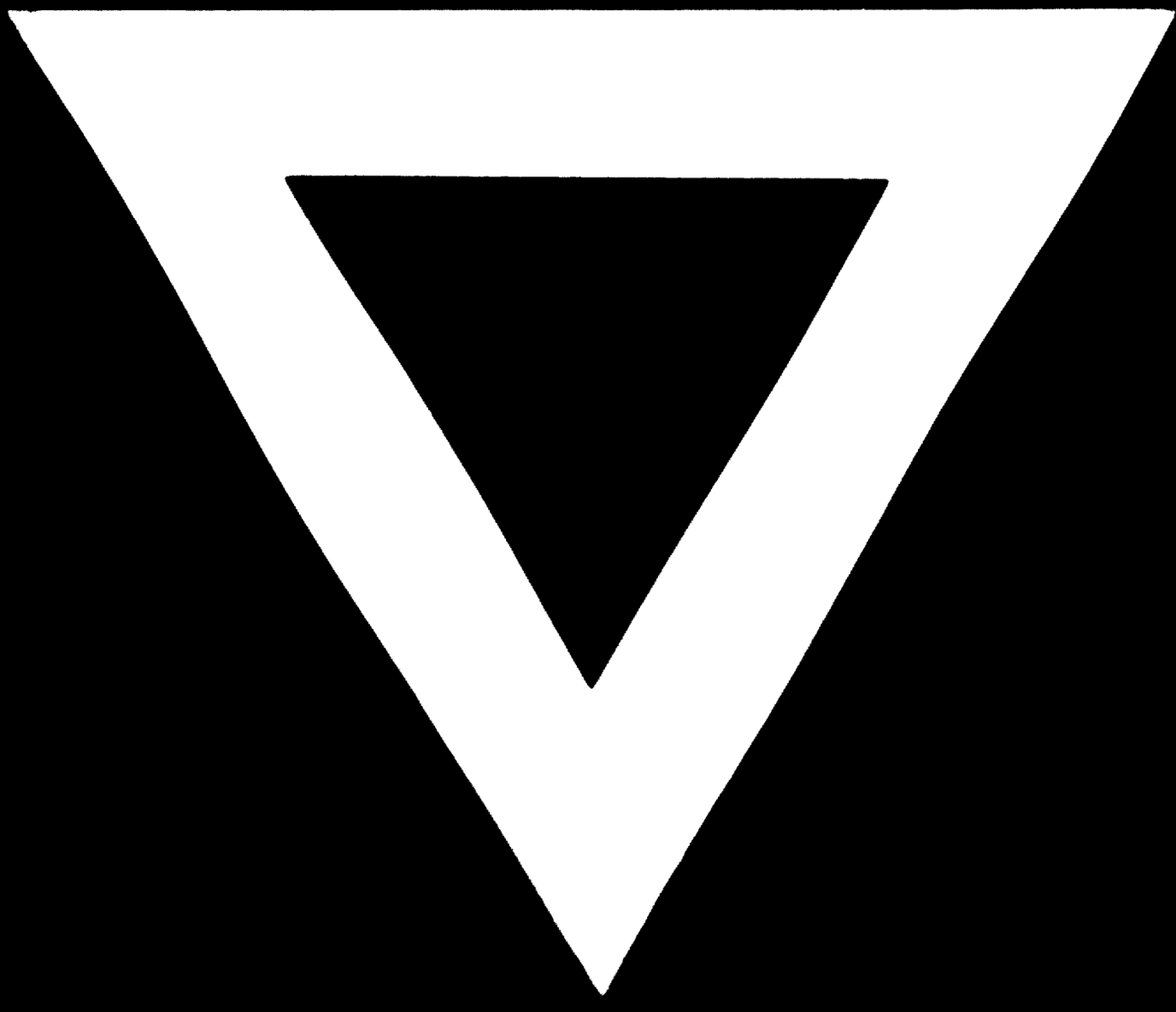

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