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REPORT ON THE SITUATION IN THE MACHINE TOOL INDUSTRY IN PERU[1/]

by

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1/ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Secretariat of UNIDO.

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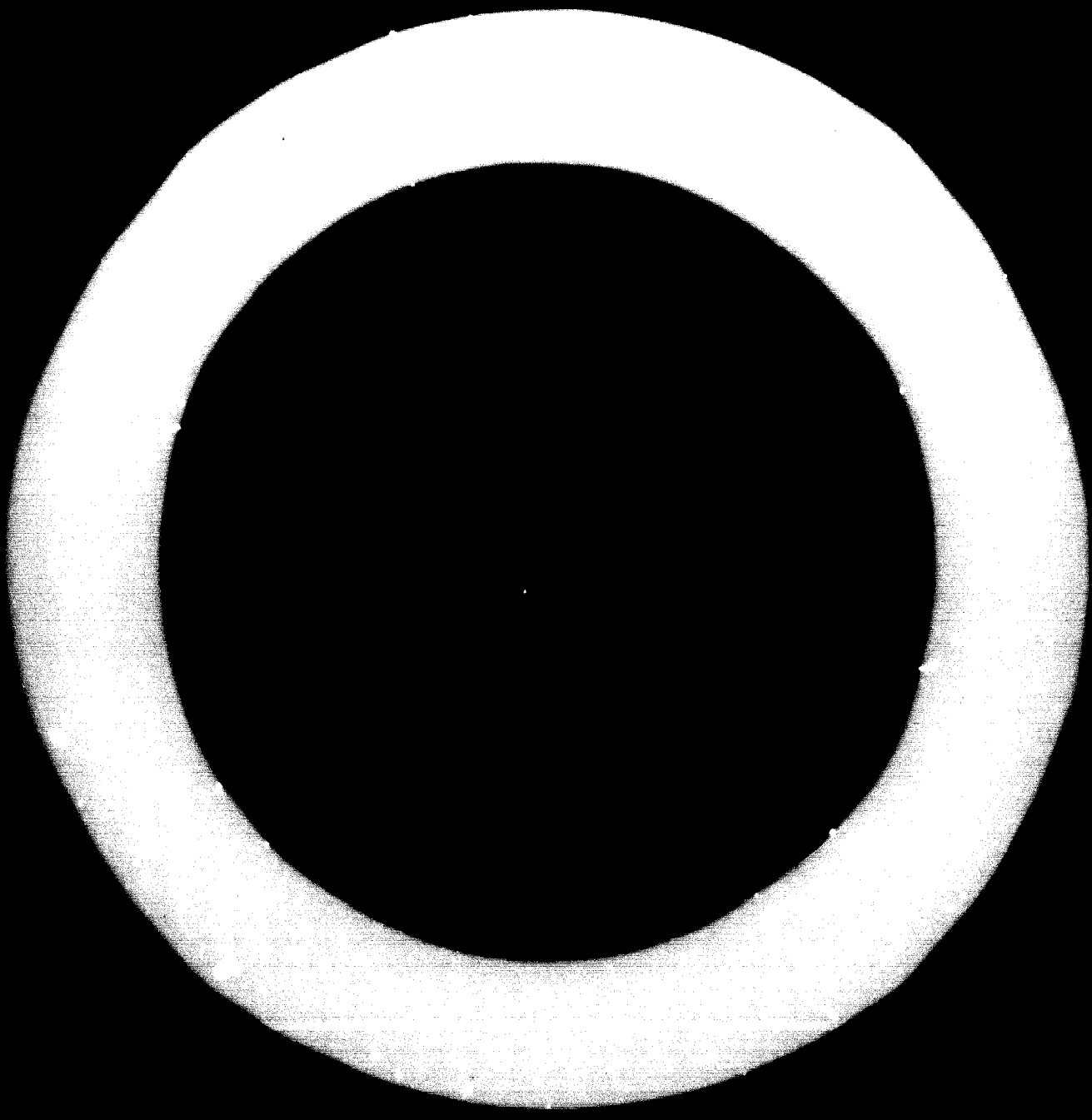


PART I: POLICIES AND GENERAL BACKGROUND

1. SITUATION IN PERU IN THE MACHINE TOOL SECTOR

The manufacture of machine tools is in the initial stages of development in Peru.

By way of background, it can be pointed out that this activity was initiated in Peru only in the 1960s.

The following are important reasons why machine tool manufacturing is in the initial stages:

(a) The market is small;

(b) There is inadequate technological specialization;

(c) There is ignorance of the market;

(d) There is no appropriate Government policy to promote the development of the machine tool industry.

1.1. Current pool of machines for use by the metalworking industry and its planning

The size of the current pool of machine tools for metalworking in Peru is estimated at 20,000.

The size and precise structure of this pool are being studied at the national level.

1.2. Demand, production and imports

1.2.1. Demand

Total annual demand for 1975-1981 is shown in table 1, annexed to this paper.

1.2.2. Production

There are four enterprises in Peru which manufacture machine tools for metalworking.

The enterprises concerned are:

ENTERPRISE	PRODUCTS
Industrias Metálicas Generales S.A.	Presses, drills, saws, folders
Cemer Perú	Presses and drills
Construcciones Metálicas Generales	Presses
Equipos Hidráulicos S.A.	Hydraulic presses

1.2.3. Imports

The imports of machine tools in the period 1967-1969 are shown in table 2, annexed to this paper.

1.3. Selection by type

The framework for the selection is provided by the sectoral programming of the Cartagena Agreement. Accordingly, the products to be manufactured in Peru will be lathes (under the liberalization programme), drills and mechanical presses (assigned to Peru) and woodworking (carpentry) machinery (under the liberalization programme).

1.4. Machine tools to be produced and to be imported

In accordance with the remarks under the previous heading, the machines to be produced are as follows:

A. Machine tools for metalworking by stock removal

Lathes

Bench

Universal power

Drills

Bench

Post

B. Machine tools for metalworking without stock removal

Power presses in general

C. Machine tools for woodworking (carpentry)

Lathes

Planers

Smoothing and finishing planers

Saws

The machines which are not manufactured in Peru will be imported.

1.5. Auxiliary industries

1.5.1. Supply of cast metal bodies

The development of steel mills with quality control able to produce precision castings for machine tools is relatively new in Peru. There

are three steel mills which would be in a position, after the necessary expansions and technical adjustments, to cast machine tool bodies.

In addition, SIDERPERU is setting up a steel mill with an annual capacity of 15,000 tonnes, which would be able to supply the cast metal bodies required by 1973.

1.5.2. Electric motors

There is a satisfactory production of domestically manufactured one-speed electric motors in Peru, and some production of two-speed electric motors.

1.5.3. Gearing

The gear industry in Peru does not meet the quality standards necessary for the manufacture of machine tools.

1.5.4. Heat treatment

The provision of heat treatment has not been adequately developed in Peru; there are installations for the treatment of small parts.

1.5.5. Supply of materials and parts

Special steels, contactors, bearings, etc. will be imported.

1.6. Present State policy with respect to machine tools in Peru

Under the Industries Act (D.L. 18350) and through the Ministry of Industry and Commerce, the Revolutionary Government of the Armed Forces of Peru has declared the manufacture of machine tools to be an "industry of the highest specific priority".

The Ministry of Industry and Commerce has undertaken the following actions

(a) It has set up a special working body for the development of the various branches and projects known as the "Project Office" under the General Inspectorate of the Ministry of Industry and Commerce.

(b) The preliminary studies for machine tool projects will be carried out by the Project Office of the Ministry of Industry and Commerce.

(c) Through the Project Office of the Ministry of Industry and Commerce, it has announced international bidding for the establishment of a factory to produce machine tools operating by stock removal.

(d) It has instructed INDUPERU, a State enterprise whose purpose is to play a part in the implementation of the State's enterprise policy in the industrial sector by providing technical and management services, to develop the following machine tool projects:

1. Metalworking machine tools operating by stock removal,
2. Metalworking machine tools operating without stock removal,
3. Woodworking (carpentry) machine tools.

(e) Through its Sectoral Planning Office, it has planned the Peruvian position with regard to the Cartagena Agreement.

This action is aimed at technological specialisation in the metalworking and mechanical engineering field, with a view to enabling the country to satisfy the domestic market and meet part of the demand of the market formed by the member countries of the Cartagena Agreement. In this connexion, the policy of maximum short-term integration of Peruvian parts into the country's production is considered essential.

2. FOREIGN TECHNICAL ASSISTANCE FOR THE DEVELOPMENT OF THE NATIONAL MACHINE TOOL INDUSTRY

2.1. Licences and consultants

In order to develop the machine tool industry at a high technological level, Peru required foreign licences. Appropriate contacts will be established for this purpose.

2.2. Semi-public enterprises

The current policy of the Revolutionary Government of the Armed Forces of Peru encourages the formation of semi-public enterprises within the framework of the stipulations of Peruvian domestic law and of the Andean Group. Machine tools are not an exception to this policy.

2.3. Bilateral assistance

No formal arrangements have thus far been made with respect to bilateral assistance for machine tool projects.

Those enterprises which are interested will obviously initiate bilateral discussions with potential suppliers of technology.

2.4. Multilateral assistance

UNIDO has made provision for Peru to receive technical assistance from a mechanical and/or industrial engineer in January-March 1973 and January-March 1974.

The purpose of this assistance is to assess existing enterprises and carry out studies for the establishment of new enterprises in the following industrial fields: machine tools, agricultural machinery and mining machinery.

3. TECHNICAL CO-OPERATION AND ASSISTANCE REQUIRED

3.1. Technology in Peru

The technological level in Peru has been constantly rising, both at the level of the universities, which confer professional titles in engineering and at technical education centres such as the National Industrial Apprenticeship and Employment Service (SENATI), which offers courses in subjects such as the following:

MECHANICS: Adjustments, maintenance mechanics, precision turning, mechanical technology, machine tool technology, milling, precision turning and planing, precision technology, etc.

RELATED TECHNICAL COURSES: Preventive maintenance, lubrication, technical drawing, workshop mathematics, basic metrology, sharpening of cutting tools, etc.

ELECTRICITY

MOTOR VEHICLES

INDUSTRIAL DESIGN

3.2. Foreign technical assistance

In the developing countries, the machine tool industry is usually initiated with the co-operation of a developed country, since the designs and technology are imported.

Since considerable time is required from the execution of the studies to establishment of the factory and the attainment of planned production, problems of obsolescence are encountered, because there are constant improvements in design and engineering in the technologically advanced countries.

It is considered that developed countries could provide the following type of technical assistance for implementation of the plan for manufacturing machine tools in Peru.

- Transfer of the latest technology and know-how,
- Training of Peruvian technicians abroad and/or sending of teonnicians to Peru,
- Supply of machinery and equipment for the implementation of the various production programmes.

3.3. Technical assistance which Peru might request from UNIDO

Training of Personnel

(a) Training of workers and supervisors in:
- Assembly and adjustment of machine tools,
- Machining of parts,
- Measurements

(b) Training of technicians and engineers in:
- Design and engineering,
- Development of technological processes,
- Progress in the field of industrial research,
- Assistance in the establishment of research centres and laboratories for the machine tool industry,
- Manufacturing technology for jigs and fixtures.

PART II: TECHNICAL ASPECTS

1. PROBLEMS RELATED TO THE DEVELOPMENT AND USE OF MACHINE TOOLS

1.1. DESIGN AND ADAPTATION

As has already been mentioned, Peru is considering importing the design and manufacturing technology for the three projects concerning the production of machine tools operating by stock removal and without stock removal and for use in carpentry.

1.2. PRODUCTION OF PROTOTYPES

In the initial stages, the prototypes will be imported together with the technology and know-how. The possibility in future, of the development of Peruvian prototypes by the planned research centre is being considered.

1.3. ORGANIZATION OF PRODUCTION

The production of machine tools is being planned on the basis of supply of the castings and gears by outside enterprises.

It is planned to establish three separate factories specializing in the production of: (1) Metalworking machine tools operating by stock removal (lathes, drills, planers, etc.), (2) Metalworking machine tools operating without stock removal (power presses) and (3) Carpentry machinery (lathes, finishing and smoothing planers, other planers, etc.).

1.4. QUALITY CONTROL

There is at present no quality control centre for machine tools in Peru. As soon as one has been set up, factories being established will be required to produce machinery complying with the latest world standards and tolerances.

1.5. UNDER-UTILIZATION AND BASIC CAUSES

In some specialized sectors in Peru, machine tools are utilized at 100 per cent efficiency. The greatest difficulty being encountered is basically the low degree of specialization of labour and the poor mastery of the use of new machining techniques.

1.6. MEANS FOR ACHIEVING EFFICIENT UTILIZATION

This problem has been contemplated by the Revolutionary Government of the Armed Forces of Peru in the Educational Reform Act, which will soon make it possible to have specialized workers and medium-level supervisory staff. This act, together with the Industries Act, ensures the technological development of Peru.

2. FACTORS WHICH MUST BE TAKEN INTO ACCOUNT WITH REGARD TO THE INTRODUCTION OF NUMERICAL CONTROL MACHINE TOOLS IN PERU

Little use is made of numerical control machine tools in Peru primarily for the following reasons:

- There are few industrial enterprises with mass production programmes;
- Numerical control machines are too costly to be justified by production programmes;
- Personnel specialized in the use and programming of numerical control machinery is required;
- The machinery must be maintained.

TABLE 1

Machine tools operating by stock removal
total annual demand for 1975-1981

MACHINES	Annual demand, 1975-1981 Breakdown of demand (%) (a)	(b)	(c)	Peru (units/year)
LATHES	20.8	37.2	100%	887
1. Power bench			9	80
2. Universal power			48	424
3. Copying			2.4	21
4. Front-operated			1.1	20
5. Vertical			1.4	12
6. Turret and semi-automatic			22	194
7. Other			5.5	49
MILLERS	7.3	9.4	100%	225
Universal			45	101
Vertical			15	34
With universal head			15	34
Other			25	56
DRILLING MACHINES	19.5	25.2	100%	600
Bench			36	216
Column			48	288
Radial			7	42
Other			9	54
PLANERS	3.8	8.8	100%	211
Shaper			75	158
Table			20	42
Other			5	11
GRINDERS	4.0	5.2	100%	123
Surface			20	25
Universal cylindrical			32	39
Centreless			10	12
Other			38	47
TOOL-SHARPENING MACHINES	1.7	2.2	100%	53
Universal			55	29
Special			45	24
POWER SAWS	8.1	2.2	100%	249
Hack			50	124
Band			27	67
Circular			23	57
BORING MACHINES	1.1	1.4	100%	34
Vertical			18	6
Horizontal			73	24
Co-ordinated (jig boring)			9	4
OPERATING BY STOCK REMOVAL	77.3	100	-	2382
OPERATING WITHOUT STOCK REMOVAL	22.3			697
TOTAL DEMAND FOR MACHINE TOOLS	100%			3079

(a) Breakdown of demand for machine tools operating by stock removal and without stock removal.

(b) Breakdown of demand for machine tools operating by stock removal.

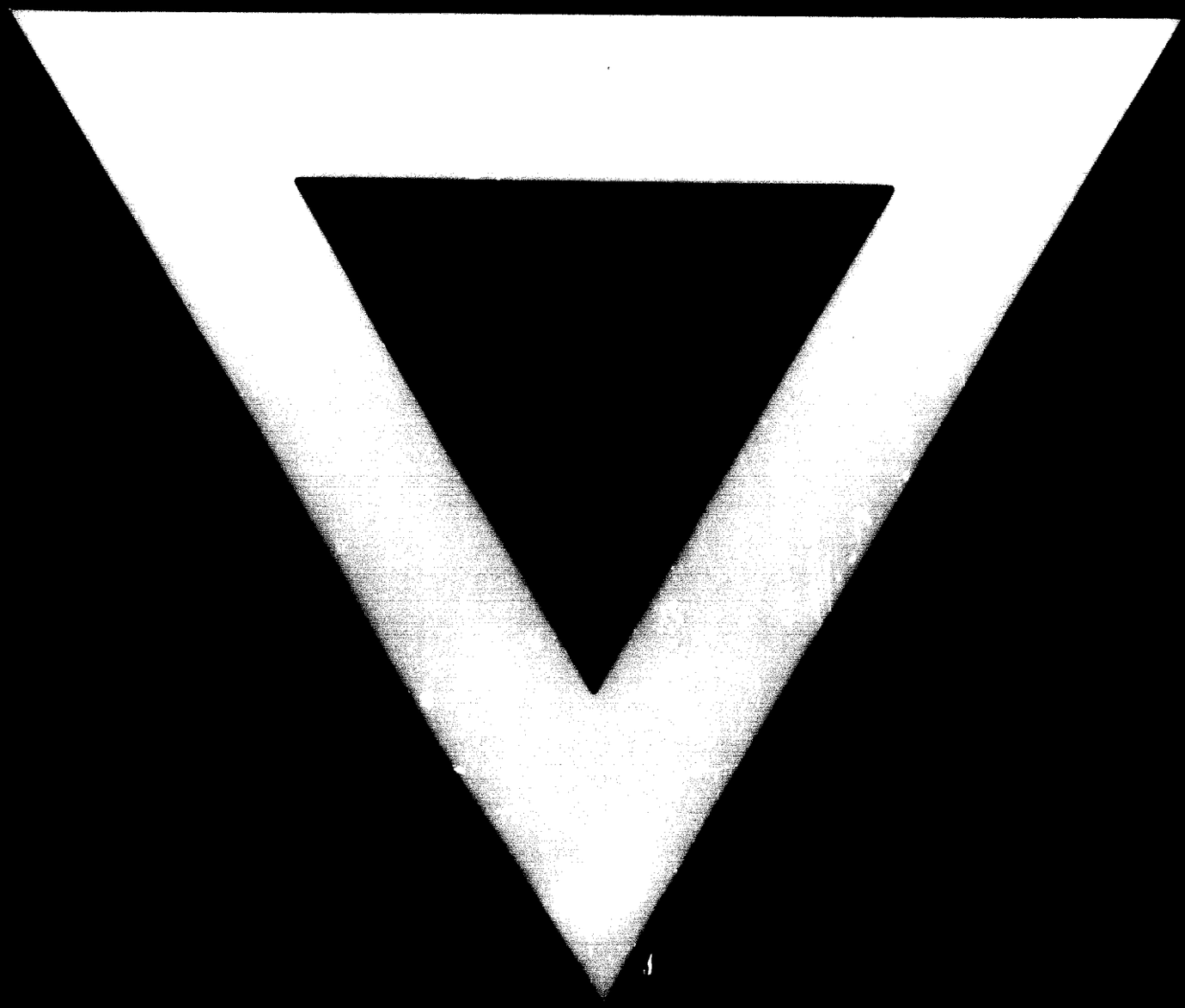
(c) Breakdown of demand for each type of machine tool operating by stock removal.

NOTE: The figures for demand were obtained by assuming an annual growth of seven per cent in the gross national product.

TABLE 2

Imports of machine tools into Peru 1967-1969

MACHINES OPERATING BY STOCK REMOVAL	
Number of machines	1961
Total weight (tonnes)	2600
Total value (US$)	5,600,000
Average weight (tonnes)	1.33
Average value (US$/unit)	2900
Value (US$/tonne)	2150
MACHINES OPERATING WITHOUT STOCK REMOVAL	
Number of machines	905
Total weight (tonnes)	1900
Total value (US$)	3,900,000
Average weight (tonnes)	2.09
Average value (US$/unit)	4300
Value (US$/tonne)	2050
TOTAL	
Number of machines	2866
Total weight (tonnes)	4500
Total value (US$)	9,500,000
Average weight (tonnes)	1.57
Average value (US$/unit)	3300
Average value (US$/tonne)	2110



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