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**REPORT ON THE SITUATION IN THE MACHINE TOOL INDUSTRY
IN BOLIVIA ✓**

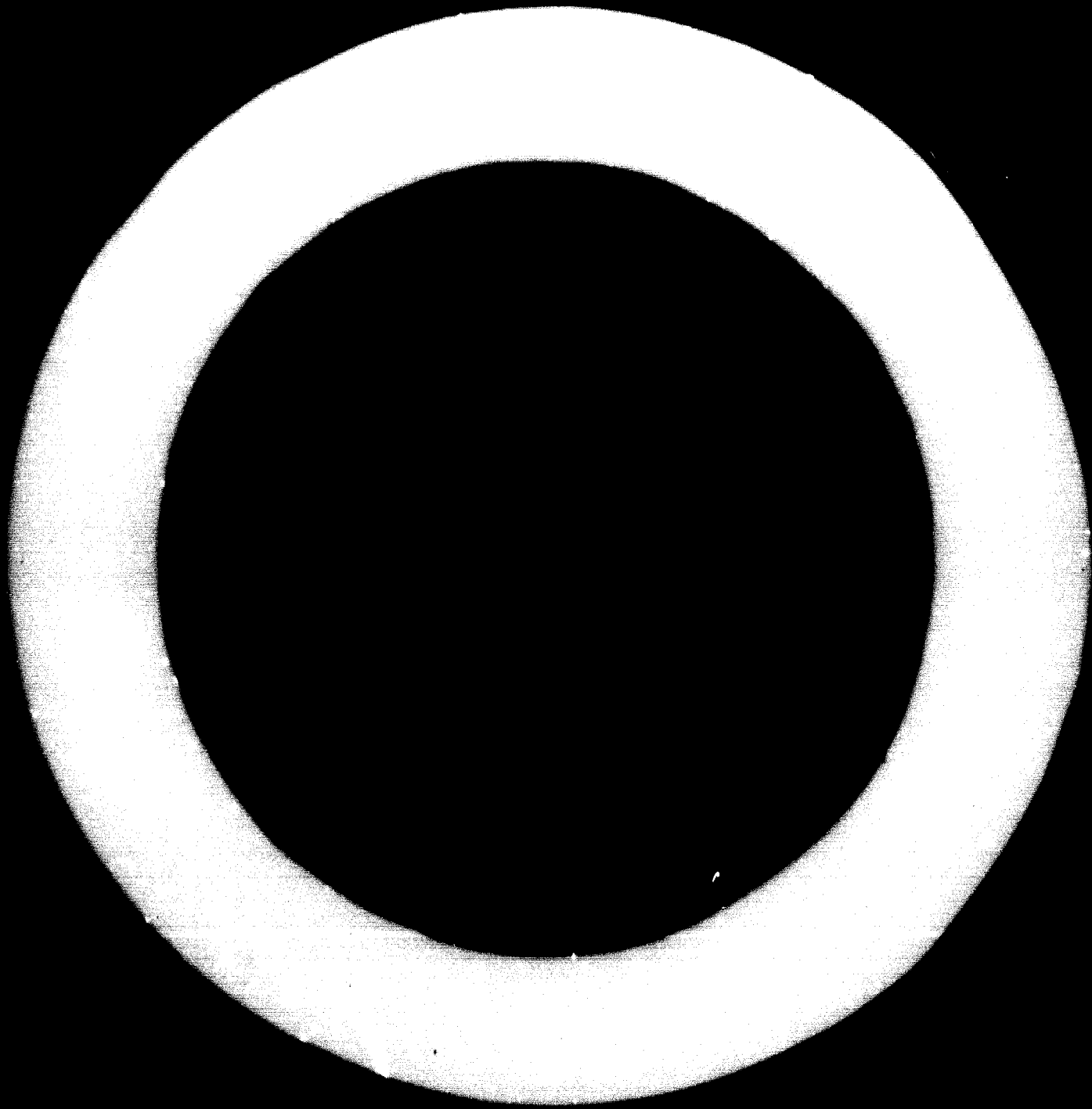
by

**Gaston A. Solis
Technical Adviser on Metalworking
and Mechanical Engineering
Ministry of Planning and Co-ordination
La Paz, Bolivia**

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. This document has been translated from an unofficially edited text.

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We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.



Policies and general background

1. Situation of the country in the machine tool sector

1.1 The machine tools in Bolivia are widely scattered and used entirely for the maintenance and resetting of mining, petroleum and railway machinery and, to a lesser degree, for the maintenance and resetting of automotive equipment. Mainly for marketing reasons, there is no metalworking and mechanical engineering industry devoted to the manufacture of machine tools.

Information on the current pool and details on production, demand, etc. are given in the attached table, which is followed by explanatory notes.

1.2 Owing to the unavailability of information, the figures for demand given in the table have been postulated on the basis of a purely natural industrial growth between 1960 and 1970 and a growth influenced by greater incentives to industry between 1970 and 1980.

Approximate figures for production (of which there has been none to the present time) have been given for the machine tools assigned to Bolivia for manufacture under the arrangements of the Cartagena Agreement, of which Bolivia is a member. These machine tools are the following:

Radial drilling machines,
Metal-cutting sawing machines,
Threading machines, etc.

As there is no production, the figures for imports are identical to those for demand, except for the above-mentioned products after 1980. In the same way, exports, which have been null to the present time, are shown beginning at the same time as production of the machine tools mentioned.

1.3 Also under the Cartagena Agreement, Bolivia has been assigned the right to manufacture the industrial products listed below, with their approximate value of production:

PRODUCT	VALUE OF PRODUCTION (US\$)
Tricones	6,800,000
Cone crushers	3,590,000
Air compressors	9,330,000
Pneumatic tools	1,180,000
Radial drilling machines and threading machines	900,000
Sawing machines	36,000
Cutting and cutting-off equipment, less than 1,000 volts	10,350,000
Tuned anodes, rods, etc.	80,000
Sealed absorption units	94,000
Ball and roller mills	4,000,000
Christmas trees	1,300,000
Driving chains	
Geodetic instruments	
Pneumatic tools in general	

The starting up of the industrial complexes manufacturing the above-mentioned products will have a great impact on the import of machine tools. However, these figures for machine tool imports are not included in this report because the relevant data have not yet been obtained.

- 1.3 The existing auxiliary industries in both forging and casting specialities are now in the starting stages and, with the exception of a single plant (which, however, has a minimum capacity with regard to forging and casting), all the other existing auxiliary metalworking and mechanical engineering concerns could be better referred to as craft workshops suitable only for miscellaneous production or repair work.
- 1.4 Since there is no domestic production, through a General Investment Law, the State facilitates the import of machinery and equipment intended for activities considered to be of the highest priority, including those in the metalworking and mechanical engineering field. The terms provided for consist of exemption from customs duties and supplementary taxes and an appropriate depreciation system.

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2. External technical assistance for the development of the national machine tool industry

2.1 In view of the commitments which the country has entered into with the other members of the Andean Pact, we expect that external technical assistance in the form of industrial licences and also the services of specialized consultants in the technical and administrative spheres will soon be required.

2.2 It is probable that semi-public enterprises with participation of the public sector and the domestic and/or international private sector will be formed.

At this stage, however, it would be difficult for the country to give details in this connexion, since economic, social and political analyses will be necessary for this purpose.

3. Technical co-operation and assistance required

To enable Bolivia to take advantage of the opportunity to produce the machine tools assigned to it under the joint programming of the Andean countries, the participation of specialized foreign enterprises, not only in the form of technical co-operation and assistance, but also in the implementation of associated projects involving public and/or private domestic capital, may be necessary.

3.1 Since Bolivia does not now have a technological infrastructure which permits it to deal adequately with the problems inherent in its industrial development, I consider it indispensable that there should be a forging, casting and machining centre to meet some of the technical requirements of the metal-working and mechanical engineering plants to be established, and also a technical training centre to meet the need for specialized labour with different levels of training which is created by industrialization.

It is mainly in these fields which UNIDO could render Bolivia a valuable service, which could consist in technical assistance for the study and execution of the centres in question.

Part II - Technical aspects

The country has not gained adequate industrial experience to enable it to discuss the subjects covered by this part of the report.

SITUATION IN 1980 OF MACHINE TOOLS

Machine tools

Year	Number of machine tools produced	Number of machine tools imported	Number of machine tools exported	Pool of machine tools	Local demand
1960	-	96	-	555	96
1970	-	139	-	1,120	165
1980	850	330	790	2,510	390
A. Milling machines					
1960	-	3	-	40	3
1970	-	5	-	70	11
1980	-	20	-	130	20
B. Drilling machines					
1960	-	20	-	110	20
1970	-	30	-	250	50
1980	150	50	140	450	60
C. Lathes					
1960	-	20	-	160	20
1970	-	30	-	360	30
1980	-	130	-	800	130
D. Grinders					
1960	-	7	-	30	7
1970	-	10	-	50	10
1980	-	20	-	120	20

SITUATION WITH REGARD TO MACHINE TOOLS
(cont'd)

Machine tools

Year	Number of machine tools produced	Number of machine tools imported	Number of machine tools exported	Pool of machine tools	Local demand
E. Presses					
1960	-	3	-	25	3
1970	-	4	-	60	4
1980	-	20	-	110	20
F. Metal-cutting sawing machines					
1960	-	15	-	60	15
1970	-	20	-	100	20
1980	700	-	650	300	50
G. Electric welding sets					
1960	-	20	-	130	28
1970	-	40	-	230	40
1980	-	90	-	600	90

EXPLANATORY NOTES TO FORM No. 1
SITUATION WITH RESPECT TO MACHINE TOOLS

The data given in form No. 1 were obtained from some of the organizations using machine tools in their maintenance operations, such as the National Roads Service, the Bolivian Development Corporation, the National Railway Enterprise and the largest local machine shop, Fundición Volcan.

However, these data have been combined with assumed data for organizations for which it was impossible to obtain information, such as the Bolivian Mining Corporation (the largest user of machine tools in Bolivia), the Bolivian State-owned Petroleum Deposits and individual local workshops.

The following explanations are considered necessary:

(a) Milling machines

The figures for the pool of milling machines include ordinary and universal milling machines, assuming a 2:1 ratio between them.

(b) Drilling machines

Pillar, bench and radial drilling machines have been included. The data for 1980 include the production of radial drilling machines, which Bolivia would by that time be producing, mainly for the Andean Group.

(c) Lathes

The figures for the pool include both lathes with a distance between the centres of less than 2 metres and also larger ones, in a ratio of approximately 1:3.

(d) Grinders

Surface grinders, grinders for motor vehicle maintenance and crankshaft grinders are all included under this heading.

(e) Presses

Only presses in the capacity range of more than 25 tonnes have been included.

(f) Metal-cutting sewing machines

This heading covers metal-cutting circular saws, band saws and jig saws, which Bolivia will be manufacturing for the Andean Group beginning in 1980.

(g) Electrical welding sets

Only portable and stationary welding sets of 250 amperes or more have been included.



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