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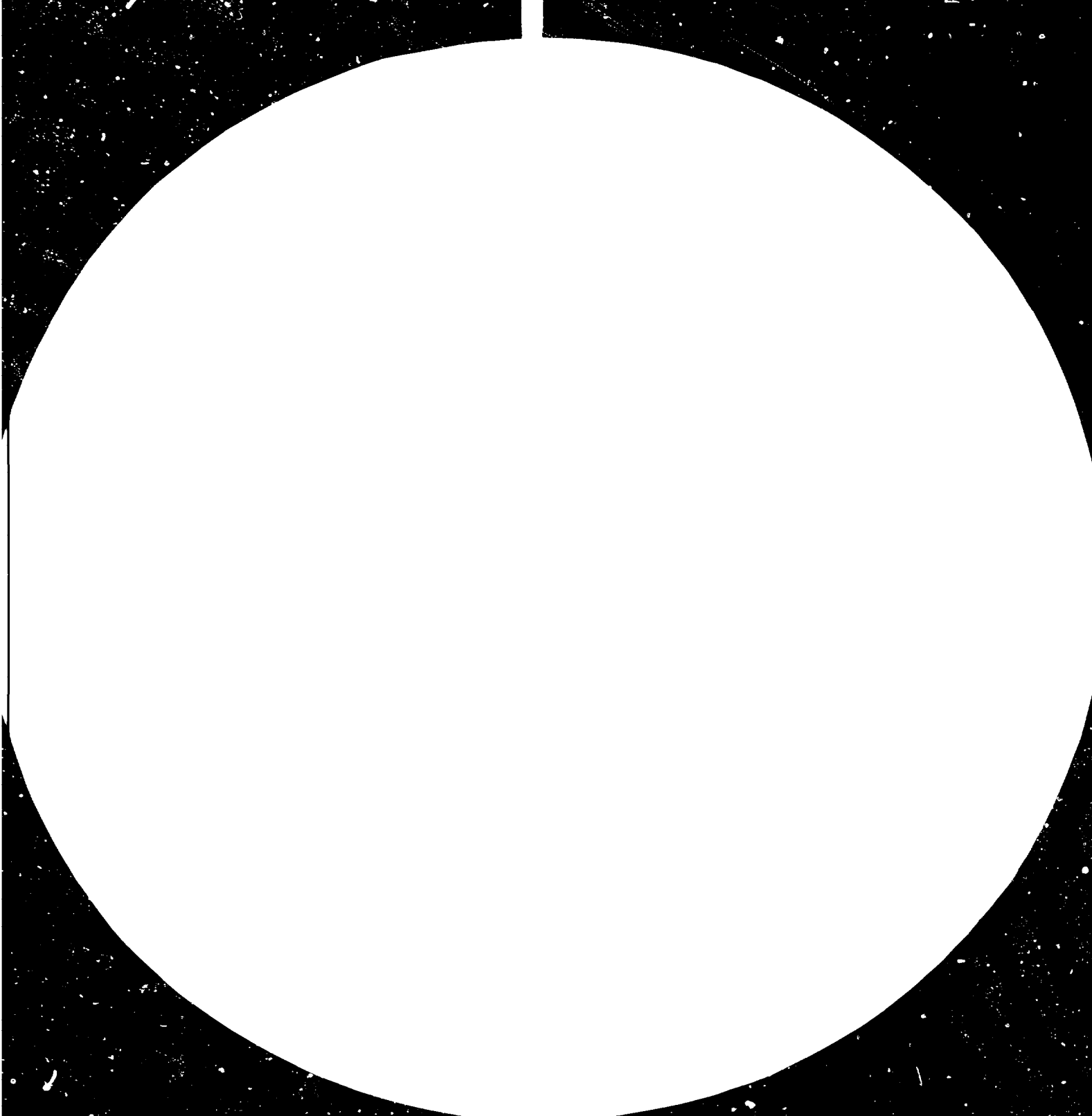
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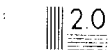
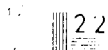
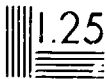
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Resolution Test Chart
1.0 1.1 1.25 1.4 1.6 1.8 2.0 2.2 2.5



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Meeting on Exchange of Experiences and
Co-operation among Developing Countries in the
Development of Agricultural Machinery Industry

Beijing, China, 20 - 27 October 1980

COUNTRY SUMMARY - PERU

by

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1. Agricultural machinery and implements needs and demand

Detailed replies will be given in the various sections for each category of machinery and implements.

On the whole, the information we are giving is based on estimates. Reasonably accurate and reliable statistical data only exist for conventional tractors. There is no such information on the other categories, and such information as we are furnishing consists of estimates based on certain data and assessments supported by our knowledge of the market and of demand problems.

2. Estimated demand and present use

Category I

There are no data on the demand in this category. There is a demand for implements by small farms and farming co-operatives which cultivate large areas and which use the implements for certain operations involving manual work such as the clearing of land and some other, mechanized, operations. The following tools should be mentioned as some of the most commonly used:

- Spades (also called palas, or palanas in Peru)
- Hoes
- Toothed sickles for harvesting and smooth-edged ones for cutting cotton plants
- Hatchets
- Machetes.

The use of animal-drawn implements varies between the different regions of the country. In the Sierra (Andean mountain region), there are very many small farms where tractors cannot be used because of the size of the farms and the slope of the land.

The proportion of such farms is small on the coast.

The most commonly used implements are:

- One-bottom ploughs 8 to 9 inches across drawn by a yoke of oxen,
- Mule or horse-drawn one-bottom ploughs 7 inches across,
- Mule-drawn cultivators for weeding and hilling,
- Mule-drawn hiller hoes with wide blades,
- Furrowers for opening furrows for water and seed, drawn by a yoke of oxen or a mule,
- Man-pushed vegetable seeders,
- Mule-drawn manure spreaders.

Category II(intermediate machinery):

- Tractor-mounted disc ploughs. The most commonly used varieties have 2,3,4 or 5 discs (70% reversible, 30% fixed or one-way).
Estimated demand: 300 p.a. Drawn ploughs are not used.
- Tractor-mounted disc harrows with 2 to 4 gangs.
The proportion of disc ploughs to harrows used is 3 to 1.
Estimated demand: 100 p.a.
- Drawn disc harrows for use instead of ploughs with tractors from 75 HP upwards. Estimated demand: 200 p.a.
- Tractor-mounted harrows for weeding and breaking up earth for use in addition to ploughs. Estimated demand: 150 p.a.
- Seed drills for cotton, maize and beans. Estimated demand: 100 p.a.
- Rice seeders. Estimated demand: 50 p.a.
- Tractor-mounted cultivators for cotton, maize and potatoes.
Estimated demand: 50 p.a.

- Manure spreaders mounted to the front and side of tractors.

Estimated demand: 50 p.a.

Category III

Simple and low cost tractors are not used. Nor has any attempt to introduce them ever been made. A small number of 5 to 8 horse-power power tillers is imported, for use in small vegetable gardens and orchards.

Estimated demand: 30 p.a.

There is a large demand for irrigation pumps on the coast of the country, where all agriculture depends on irrigation.

The following types are used:

- Pumps for deep tubed wells. Demand: 100 p.a.
- Centrifugal pumps (motor pumps and pulley-driven pumps). Estimated demand: 300 p.a.

Category IV

Medium and large tractors: These are the most widely used in the country. At present, the fleet of serviceable farming tractors in the country can be estimated at 4,700 wheel tractors and 500 crawler tractors.

Annual demand is estimated as follows, in order of decreasing importance:

Wheel tractors:

70 - 80 HP	300
60 - 65 HP	150
100 - 130 HP	50
30 - 45 HP	50
20 - 30 HP	50
140 - 150 HP	30

Crawler tractors: 50 p.a.

Combine harvesters:

12 to 14 feet across: automotive type

20 to 30 feet: mainly for rice.

3. Manufacture and imports

3.1 Category I

In the tool and implement category, only spades are manufactured in the country, using imported steel which is processed locally. There are imports, for which protection duties are paid to the national industry.

All other tools are imported, and local manufacture cannot be considered because it would not be justified by demand and because conventional mass-produced tools are imported from well-known international manufacturers.

There is some national production of animal-drawn implements by craftsmen and in small factories. Small-scale production by craftsmen is peculiar to the Andean region, where ploughs are made of wood, except for the point, according to a design which is traditional for the indigenous rural population. On the coast, mainly imported implements are used, but the demand is small. The reason for this is that these implements last for many years and only the broken parts are replaced, which are, for the most part, manufactured locally by craftsmen or in small factories.

3.2 Category II

Most of the intermediate machinery is manufactured locally. There are two medium-sized factories and two smaller ones which produce implements for tractors such as ploughs, harrows, tool-bars, cultivators etc. from designs which are very close to the conventional ones. Production is sufficient and there is an unused installed capacity of 30 to 40 %.

Machinery such as mills, grain-crushers, mincers, forage-cutters,

insecticide-spraying pumps etc. are mostly imported, though the volume of annual imports is small.

There is a design and engineering capacity in the private sector in Peru. The problem is the smallness of the market, which in most cases does not justify local production.

3.3 Category III

Wheel tractors with 40 to 120 HP are produced in Peru by assembling Massey Ferguson tractors. Related to models of British origin, the ones most commonly produced and sold are the 290, 265 and 250 models. Wheel tractors in this power range may be imported, but only with a special duty of 60% ad valorem. Tractors with less than 40 HP and more than 120 HP are imported with low import duties.

The Massey Ferguson tractors are manufactured in a modern plant by a mixed company established by the State (51%) and Massey Ferguson (49%). The models produced are the same as those in the Massey Ferguson series. S.k.d. sets are imported, about 22% of the value / ^{being} added locally. Assembly of Perkins motors will begin in Peru in a similar plant operated by a mixed company owned by the State (51%) and Perkins-Volvo (49%). The production of tractors in 1980 will be 450, and it is estimated that 100 to 150 will be imported.

The production system will remain the same in the next few years, and the number of tractors produced is expected to be increasable by developing the national market by about 20% annually and by exports to the Andean Group of Countries.

Models with less than 40 and more than 120 HP will continue to be imported with low import duties and imports of tractors with between 40 and 120 HP will be permitted, albeit with higher but probably gradually decreasing duties.

The tractor plant could produce at least three times as much in two working shifts in one year. Present investments amount to about US\$ 3 million. There are investment plans which will make it possible to increase the local share in value-added, depending on whether the market continues to improve as it has begun to this year.

Local manufacture is faced with problems of volume, or scale. It is nevertheless efficient in one series of items, in particular in pneumatic tyres, which are appreciably cheaper than imported tyres. The plant is not inefficient and sales prices are reasonable, albeit higher than for similar products in other countries because owing to the small volume of production and sales the profit margins have to be somewhat wider, and because of the cost of local financing due to high interest costs.

There are no major technical problems. There are competent engineers in the country and the workforce is efficient and highly productive.

3.4 Category IV

a) The foundry facilities can be grouped as follows:

- 1) SIDERPERU, which has a facility for smelting ingots with three electric arc furnaces with a capacity of 40 tons p.a. This facility is not in use at the moment because the iron and steel firms have replaced the ingot system by the continuous casting system.
- 2) Facilities for manufacturing mill-balls and mills for the mining industry. There are two companies, NEFSA and Consorcio Metalúrgico.
- 3) There are three(sic) smaller foundries for various items no larger than 600 kilograms. These are: Fundición Callao, Fundición Maleable S.A., Fundición Centrífuga S.A., FUMAPER.

Forging:

There are only two fairly small forging plants in Peru, one of which is basically specialized in the manufacture of farming implements, while the other manufactures household hardware such as cutlery, knives etc. This process has not yet been adequately developed.

Heat treatment

Apart from the facilities belonging to a number of firms which use this process for their own activities, there are only two firms which carry out heat treatment for outside customers, namely Aceros Bohler del Perú and Gramil Comercial.

Gearshops

At present, there is no gear-cutting industry in Peru. Nevertheless, in view of possible developments under Decision 120 of the Cartagena Agreement, it is hoped that a gear plant will be established with investments of the order of US\$ 50 million, which will in turn require a light industrial forging facility with an initial capacity of some 8,000 tons p.a. and investments of about US\$ 40 million.

The country is awaiting the Government's decisions on allocations to the automotive engine industry before executing the projects mentioned above.

- b) There are a great many ancillary industries in Peru specializing in the manufacture of enamelled metal articles and simple automotive engine parts, as well as ~~xx~~ metal engineering plants manufacturing boilers, gantry cranes, metal structures and fairly sophisticated equipment for the mining industry.

Some of these firms are: Metal Empresa, FABRINET, APIX, Magensa, Consorcio Metalúrgico, FIMA. These industrial firms use a considerable amount of industrial machinery, but none of them have developed mass production except in the enamelled metal sector.

- c) The most important limitation on the establishment of these industries is the market, as investments in sophisticated equipment are required to obtain a high quality and low price product. This is why, as mentioned above, we are awaiting the Government's decisions on the automotive engine industry in the context of the Cartagena Agreement, which will provide the market needed for the establishment and development of these industries.

d) We think that the main effort to be made is to provide industry with low-interest funds to finance sales, as at present the cost of funds is disproportionately high, with interest rates of the order of 35%.

The Government has set up a special fund to promote sales of capital goods, known as FONCAP, which is helping to solve the problem to some extent, but we do not consider this sufficient.

4. Design and development, adaptation, testing and evaluation

Peru has the National Agricultural University of La Molina, Lima, Peru, with the first agricultural engineering faculty to be set up in South America. It was established in 1962 and began its activities with a joint project with FAC. The Faculty has qualified staff but suffers from a lack of resources for research, design and development, adaptation, testing and evaluation. Its activities could be stepped up in all these fields. There are no State institutions working in the field of agricultural machinery. Any such programme would have to revolve around the Agricultural University and would also depend on the participation of other universities.

The National Agricultural Research Institute (INIA) is not/active in the field of agricultural machinery. Its activities are chiefly oriented towards agronomy. It could conceivably take part in, and, as a specialized State body co-ordinate some programme in the field of mechanization. yet

The development of the agricultural machinery industry cannot go very far compared with other industries because of the limited demand. Peru has only 2 million hectares of farmland, of which almost 60% can be tractorized. The winning of new arable land is a priority for the country, but it requires large investments and the incorporation of new land will take time.

5. Engineering and manufacturing technology

The answers in section 4 include the answers to questions a), b) and c) of this section.

6. Repair, maintenance and spare parts supply

Repairs on tractors and agricultural machinery are usually carried out by the selling firms, by independent repair shops and, in the case of firms with a fairly large fleet, by these firms themselves.

There are considerable differences in preventive maintenance, which often leads to problems with operation and premature damage.

There have been serious problems with the supply of spare parts for several years because of import problems occasioned by a shortage of foreign exchange. This situation has now been overcome and the supply is more or less normal. Prices are rather high because turnover is generally low and profit margins are larger than elsewhere. In addition to the standard spare parts there are also other spare parts on the market, made by firms which are not manufacturers of machinery. In the whole, the great majority of spare parts are imported.

7. Policy, planning, strategy and co-ordination

There is no national body at the ministerial level in Peru responsible for policy and planning in the agricultural machinery industry. Nor is there an inter-ministerial working group.

8. Interregional co-operation

It is difficult, for the moment, to see how interregional co-operation could give to other developing countries the kind of assistance they need from them.

First, internal co-ordination will have to be improved. We think that interregional co-operation could take place at the level of the Andean Group of Countries, but there is still not much progress in this Group in the field of agricultural machinery.

9. Role of UNIDO

Some years ago, UNIDO sent an expert, Dr. Ettore Gasparetto, who conducted a survey of the agricultural machinery industry and some aspects of the problems connected with the mechanization of agriculture.

INDUPERU, the State industrial promotion agency, also received technical assistance from UNIDO in drafting plans for a tractor factory, which was subsequently set up after the establishment of the mixed-ownership company Tractores Andinos S.A.

Answers to the other questions in this section are given in section

10. Specific proposals and recommendations

- 1) Trials, tests, and evaluation of tractors and agricultural machinery;
- 2) Modernization programme for implements and machinery in categories I and II, in particular in the Andean region. There is a programme of this kind in Colombia, conducted jointly with the United Kingdom. A programme could be organized by UNIDO, FAC and the Government of Peru.
- 3) Promotion of agricultural machinery design in the agricultural engineering programme of the National Agricultural University.

