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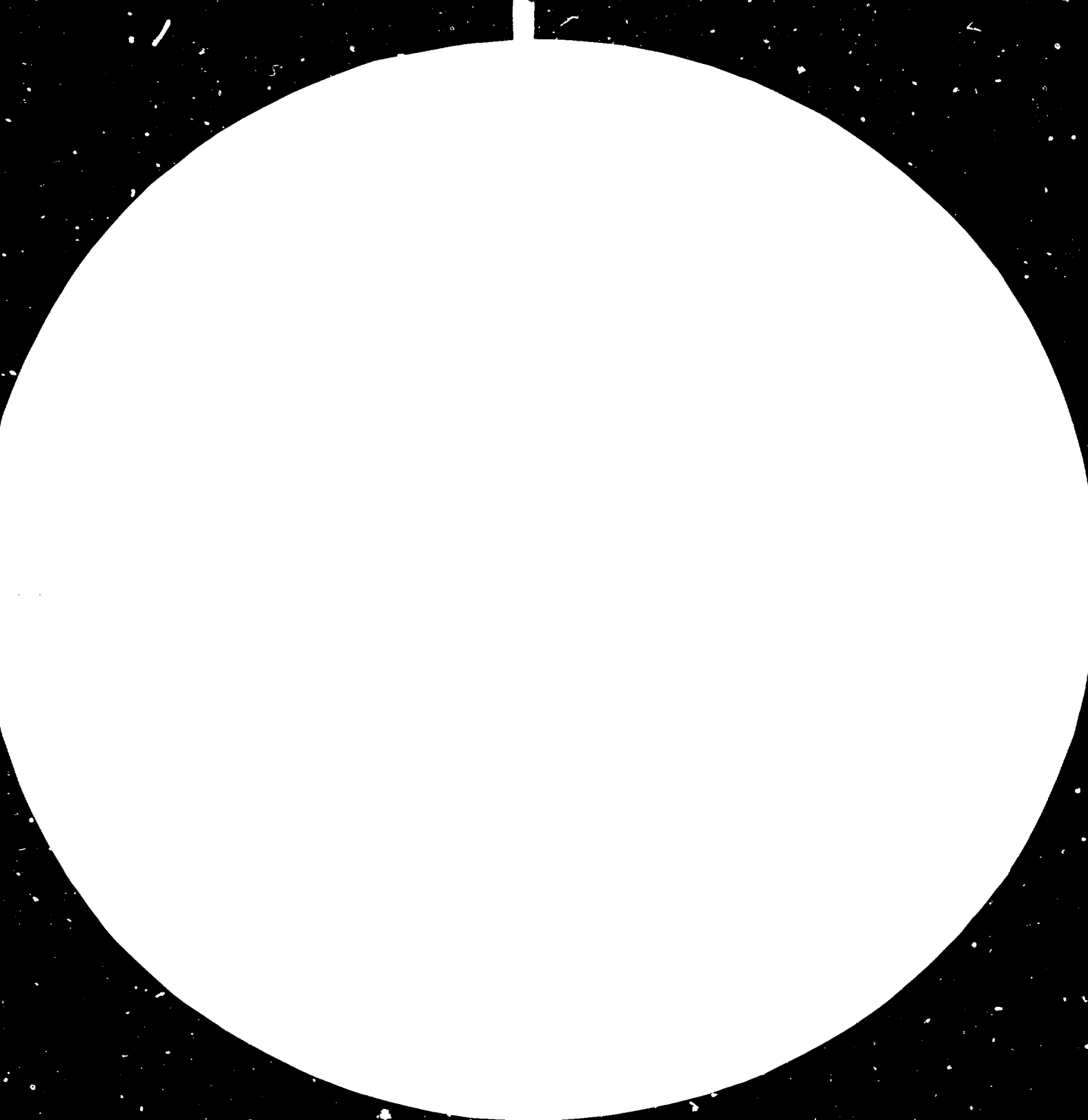
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Distr.
LIMITED

ID/WG.330/25
8 October 1980

ENGLISH
Original: FRENCH

United Nations Industrial Development Organization

Meeting on exchange of experiences and
co-operation among developing countries
in the development of agricultural
machinery industry

Beijing (China), 20-27 October 1980

PAPER FROM THE MALIAN COMPANY FOR THE DESIGN AND
MANUFACTURE OF AGRICULTURAL EQUIPMENT ^{1/}

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^{1/} The views and opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the UNIDO Secretariat. This document has been translated from an unedited original.

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I. Introduction

Mali is a landlocked West African country with a predominantly agricultural economy. More than 85 per cent of the Malian population is employed in the primary sector.

It goes without saying that the way to achieve harmonious development is to improve the standard of living of the great bulk of the population living in rural areas. Mechanization represents a powerful factor in the modernization of agriculture.

For that reason, the Malian Government, with the assistance of France, established an agricultural equipment plant in 1974. This plant is managed by a mixed company called the Malian Company for the Design and Manufacture of Agricultural Equipment (SMECMA). SMECMA's principal objective is to provide the farmers, at the least possible cost, with the agricultural implements necessary for increasing agricultural productivity and production.

II. Presentation

SMECMA manufactures a full range of animal-drawn agricultural implements:

Ploughs: light, medium, and heavy;

"Ciwara" multicultivators, with five attachments;

Carts having a useful load of 1,000 kg;

Seed drills, single-furrow, with a set of discs;

Harrows, two-element;

Harrows, three-element, for simplified tractors;

"Falidaba" hoes, donkey-drawn;

Trailers having a useful load of 3 tonnes, for simplified tractors.

The theoretical production capacity is about 90,000 units a year. The average business turnover amounts to some 3 billion Malian francs.

1. Estimated agricultural equipment requirements for the next five years

| Category of equipment | Item of equipment | Estimated annual requirements | | | | |
|-----------------------|--------------------------------|-------------------------------|-------|--------|--------|--------|
| | | 1981 | 1982 | 1983 | 1984 | 1985 |
| Category I | Dah */ fibre-removing machines | 115 | 170 | 187 | 210 | 220 |
| | Wheelbarrows | 180 | 240 | 250 | 270 | 300 |
| | Miscellaneous | 4,845 | 5,025 | 5,500 | 6,000 | 6,500 |
| Category II | Ploughs | 5,635 | 6,185 | 6,500 | 7,000 | 7,500 |
| | Multicultivators | 2,470 | 2,600 | 3,000 | 5,000 | 6,000 |
| | Carts | 9,000 | 9,790 | 10,120 | 10,800 | 11,500 |
| | Seed drills | 6,075 | 6,755 | 6,980 | 7,200 | 7,800 |
| | Harrows | 1,685 | 1,800 | 2,100 | 2,500 | 3,200 |
| | Hces | 2,820 | 2,920 | 3,150 | 4,100 | 5,500 |
| Category III | Simplified tractors | - | - | - | 50 | 100 |
| | Motor-driven pumps | - | 50 | 100 | 120 | 150 |
| | Ancillary equipment | 65 | 100 | 120 | 150 | 200 |
| Category IV | Medium and large tractors | - | - | - | - | - |
| | Automotive equipment | - | - | - | - | - |
| | Combine harvesters | - | - | - | - | 10 |

2. Estimated demand and current use

The current demand for agricultural implements is estimated at about 30,000 units. This figure, however, refers only to the equipment of category II, that is, animal-drawn agricultural implements. Within this category, the breakdown by type is as follows:

*/ Translator's note: Dah is a Malian plant whose fibre is used to make bags and sacks.

| | |
|-------------------|-------|
| Floughs, light: | 2,000 |
| Ploughs, medium: | 4,000 |
| Multicultivators: | 1,650 |
| Seed drills: | 6,000 |
| Carts: | 7,000 |
| Sprayers: | 3,800 |
| Harrows: | 1,500 |
| Hoes: | 4,000 |

Having proven themselves in prototype testing under real conditions before entering series production, these implements give entirely satisfactory performance.

3. Manufacture and import

In order to make possible the manufacture of these implements, SMECMA imports every year nearly 4,000 tonnes of raw materials: iron, various sections, flat bars, etc. At present, all forged parts as well as all nuts and bolts are imported.

3.1 Category I implements

At present, the implements in this category are imported by private merchants and the commercial houses according to market requirements.

SMECMA plans to begin local production of certain of these implements next year, concentrating on wheelbarrows and gardening tools. Studies along these lines have already been carried out, and all that remains to be done is to find a source of financing.

3.2 Category II equipment

Our plant is currently producing the equipment covered in this category.

We have already furnished a list of this equipment in section II of this paper. Our intention is to diversify our product line by introducing some new items, specifically, hoes.

To be able to deal with last-minute orders, we maintain an emergency stock of between 1,000 and 1,500 units for each type of implement.

We have within the country the skills and capacity required for the design and production of these implements. The country has the following institutions:

SMECMA's own Design Office;

The Agricultural Mechanization Design and Testing Centre for Agricultural Mechanization (CEEMA) and the Design Office of the Agricultural Mechanization Division;

The Rural Development Service with its Agricultural Mechanization Testing Stations (PEDMA) and the "Blacksmith" programme.

With a view to increasing the value added component of our products, we have applied for foreign financial assistance to be used in the building of an industrial forge.

3.3 Motorized and special equipment

At present, we are producing implements for use with simplified tractors: trailers and three-element harrows. It is planned to begin production of category III equipment in 1982. The earliest starting date for the production of category IV equipment, on the other hand, is 1985.

The following approach has been adopted for the manufacture of these implements:

Local manufacture of simple parts;

Import of the more complicated parts and sub-assemblies; and

Assembly.

For this purpose, we intend to expand our existing installations. It is expected that there will be problems and the need for help in the following areas:

Technical assistance in the production phase;

Investment; and

Organization of after-sales service.

3.4 Basic installations and related industries

Mali has no forging facilities, but does have a large number of machine-shops. It is also worth noting that there is a foundry, which, although semi-artisanal in nature, is of great value and could be improved.

A related or auxiliary industry that might be mentioned is the PVC piping plant.

The major obstacles in the way of the establishment and further growth of industrial enterprises of this kind are financial and technical in nature.

To develop these facilities it would in our view be necessary to replace certain existing equipment and increase production capacity.

4. Design and development, adaptation, testing, and evaluation

Our equipment is designed in close co-operation with the Agricultural Mechanization Division. At Samanko, 20 km from Bamako, this institution operates fully equipped installations, with:

A design office;

Machine-tools for use in manufacturing various parts;

Test benches for the testing of agricultural implements;

A complete range of agricultural equipment, from hand tools to combine harvesters;

Test equipment for measuring hardness, traction, etc.;

A proving ground for the comparative testing of equipment;

Prototypes of agricultural implements;

An agricultural mechanization school for the special training of agricultural technicians and agronomists.

We might also briefly mention, in passing, the Agricultural Machinery Testing Stations (PEDMA) operated by the rural development service and SMECMA's own design office.

The Agricultural Mechanization Division deserves to be strengthened on the logistics side so as to enable it to perform its mission properly.

5. Technical studies and manufacturing techniques

The existing institutions can provide the technical assistance and guidance necessary for the development of manufacturing techniques for the range of implements we are currently producing. On the other hand, foreign technical assistance will be needed to begin production of the implements of categories III and IV.

6. Repair, maintenance, and spare parts

SMECMA provides after-sales service for whatever agricultural implements it produces by making available to the growers who use this equipment the replacement parts they require.

The Rural Development Service also operates what is known as "Blacksmith" programmes, for the training of local artisans. In fact, the solution in Mali would seem to consist in using the network of village smiths by training them to undertake the necessary repairs and to make by themselves the various replacement parts required.

SMECMA is working closely with these local craftsmen in two ways - subcontracting and supply.

6.1 Subcontracting. We subcontract to affiliated local craftsmen working under supervision the manufacture of certain agricultural equipment parts. In this way, these craftsmen can more easily amortize their technical installations, while at the same time such parts cost less than they would if they had to be made in the factory.

6.2 Supply. We sell our steel waste to the blacksmiths at very reasonable prices. This enables them to improve the quality of the spare parts they manufacture.

7. Policies, planning, strategies and co-ordination

There is in Mali a technical body known as the National Advisory Committee on Agricultural Mechanization, which is responsible for advising the Government on its policy in this field. The Committee consists of the following members:

Representatives of the departments of finance and trade; agriculture; stock-raising, forestry; and industrial development;

Officials of the Rural Development Service;

Officials of the Bureau of Agricultural Engineering and the Division of Agricultural Mechanization;

Manufacturers of agricultural equipment;

Importers of agricultural equipment.

In a word, this Committee comprises all parties interested in the future of agricultural mechanization. It meets every two years.

8. Interregional co-operation

Our country can provide assistance to other developing countries in the design and manufacture of animal-drawn agricultural implements. This may be done in the following ways:

The design of prototypes to be tested for suitability to the ecological conditions of the country in question;

The design of jigs for use in the manufacture of the prototypes selected;

The manufacture of equipment, using either craft or industrial methods.

Another equally important area in which our country could be of assistance to other developing countries is the rational use of animal-drawn agricultural implements: the training of draught animals, the proper adjustment of cultivation equipment, maintenance, etc.

Mali is interested in learning from the experience other developing countries may have in the area of simple motorized equipment. Similarly, more comprehensive motorization is also an aspect of great and continuing interest.

9. The role of UNIDO

We believe that UNIDO could assist our country with respect to financing. To date, assistance of this kind has not been requested.

In our opinion, one way in which the machinery for the exchange of technical information between UNIDO and our country might be improved is through the establishment of a monthly newsletter. This newsletter or bulletin might contain sections on the following subjects:

The role of UNIDO;

UNIDO's activities throughout the world, with special emphasis on the developing countries;

UNIDO projects throughout the world and specifically in the developing countries.

10. Specific proposals and recommendations

The main areas in which our country might require assistance for the development and promotion of its agricultural machinery industry are:

The financing of studies on the building of an industrial forge at SMECMA;

Financing for the expansion of the plant;

Financing for the building of a unit to manufacture simplified tractors: and

Technical assistance in the start-up of this unit.

