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Round-Table Ministerial Meeting on  
Co-operation among Developing Countries  
in the Field of the Agricultural  
Machinery Industry

Buenos Aires (Argentina), 3-7 November 1986

REPORT\*

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Explanatory notes

Besides the common abbreviations, symbols and terms, the following have been used in this report:

|       |  |
|-------|--|
| DAT   | Dirección General de Asesoramiento Técnico de Santa Fé (Argentina) |
| ECDC  | Economic Co-operation among Developing Countries                   |
| ESCAP | Economic and Social Commission for Asia and the Pacific            |
| INTA  | National Institute of Agricultural Technology of Argentina         |
| INTI  | National Institute of Industrial Technology of Argentina           |
| R+D   | Research and Development   |
| TCDC  | Technical Co-operation among Developing Countries                  |
| UNDP  | United Nations Development Programme                               |

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## INTRODUCTION

The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held at Lima, Peru, in March 1975, stressed the importance of economic and technical co-operation among developing countries (ECDC/TCDC) by calling on the international community to make concerted efforts in support of the developing countries' endeavours to gain greater share in world industrial output through increased co-operation. The Caracas Plan of Action adopted by the High-level Conference on Economic Co-operation among Developing Countries, held at Caracas, 13 to 19 May 1981, reaffirmed the pertinent recommendations contained in the Buenos Aires Plan of Action for promoting and implementing TCDC. It further recommended that in supporting ECDC/TCDC efforts, priority attention should be placed on the utilization of technology, skills and resources available in the developing countries.

This Round-Table Ministerial Meeting to develop co-operation projects in a specific sector was the second of its kind organized by UNIDO in Buenos Aires, from 3 to 7 November 1986. The first one was held in Novi Sad, Yugoslavia, on the food-processing industry, where the participants discussed 109 projects of mutual interest and a major recommendation was made by the meeting that UNIDO should continue to convene this type of meeting in view of the results achieved and the innovative character of that meeting.

This Round-Table Ministerial Meeting on a specific industrial sector was organized on the basis of mutual benefit under the general guidelines of ECDC/TCDC and it was expected that the follow-up of the agreements reached during the meeting would be actively carried out by the co-operating partners.

## I. ORGANIZATION OF THE MEETING

The Meeting was attended by participants from 16 countries apart from the host country and by 2 observers.

The list of participants is given in the annex.

### Opening addresses

The Round-Table Ministerial Meeting was opened on 3 November 1986 by the Deputy Director-General of UNIDO. He welcomed the participants to the Round-Table Ministerial Meeting on behalf of the Director-General of UNIDO. He then thanked them especially for having taken the time and trouble to travel to Argentina, and the Government of Argentina for hosting the meeting.

The Deputy Director-General spoke of the fact that food aid per se cannot solve the problems of hunger and malnutrition but that the bulk of food must be produced locally by a properly functioning agricultural system - that is a system which uses the essential inputs from industry as well as its operational and managerial methods. In conclusion, he emphasized that the discussions with both the Argentine hosts and other delegates could be organized on bilateral or multilateral lines in order to give the interested delegates the opportunity to discuss co-operative arrangements in the production and trade of agricultural machinery. He further stressed the importance of delegates presenting their projects so as the bilateral and multilateral discussions could facilitate concrete co-operation projects. He noted that the two major issues examined during the Third Consultation Meeting on the Agricultural Machinery Industry held in Belgrade (Yugoslavia) from 29 September to 3 October 1986 - the potential of co-operation between more advanced and less advanced developing countries and the problem of the integrated development of agriculture and the agricultural machinery industry - were important considerations for this Meeting. He also pointed out that the conclusions and recommendations of the Consultation Meeting could also provide a useful basis for the deliberations of this Meeting.

In his opening address, the Under-Secretary of State for Foreign Trade of the Republic of Argentina welcomed the participants present at the Meeting and divided his speech into three parts:

1. His standpoint as to the way to strengthen co-operation among developing countries.
2. The Republic of Argentina's reconstruction and its technical co-operation potential.
3. Strategical prospects of the agricultural machinery and implements sector.

He pointed out that the main objective of this Meeting is to foster South-South co-operation in order to develop agricultural machinery industrialization and in this way, increase food supply in developing countries. He stated that this increase would contribute to consolidating world peace. This could be done by means of the cause-and-effect ratio. For example: The technical assistance for the construction of a plant in Africa with Argentine technology would help increase food production in that region.

There is a need to mutually co-operate so as to reconcile and harmonize design processes, implementation and enforcement of economic policies.

The Under-Secretary of State stated that the participants were required to:

- a) Undertake medium-term (5-year) commitments;
- b) Define tangible goals regarding technical assistance, training, implementation of turnkey jobs and production supplementation.

He further went on to say that when entering into the democratic world three years ago, Argentina laid down the basic conditions for its economic development and projection abroad. Thus, after overcoming a 30 per cent monthly hyper-inflation, achieving stabilization of prices and increasing industrial production to 12 per cent, Argentina was creating the basis necessary for investment and growth.

Argentina produces foodstuffs and manufactures the machinery required to produce it. Seventy per cent of its exports came from the food industry. Counting on the active support given by INTI, INTA the entrepreneurs were now in a position to co-operate and transfer the said technology to those countries willing to become associated with Argentina. The comparative advantages of Argentina were the result of four factors: Costs, quality, technology and willingness to co-operate.

With regard to costs, Argentina had many resources available regarding technical/skilled labour for the metallurgical and metal-mechanic industries and the compensation requirements were considerably lower. As far as quality was concerned, Argentina was making every possible effort to become - and be considered as - a developing country able to compete as regards quality with developed countries. The limited resources available in Argentina led the country to adapt machinery production to the operation conditions characteristic of a developing country, having to face maintenance difficulties.

In conclusion, the Under-Secretary of State stated that Argentina was willing to become associated with developing countries, promote their mutual growth and defend itself against the commercial protectionism of developed countries.

After having been elected, the Chairman of the Meeting thanked all the participants present and referred to the fact that at this Meeting, there were representatives of the three most populous continents in the world to try to attain with the support of the private entrepreneurs in Argentina fruitful co-operation agreements in the agricultural machinery industry with the final aim of increasing food supplies in those countries. He referred to the conclusions and recommendations of the recently held Third Consultation on the agricultural machinery industry - mainly that it was necessary to develop local production in developing countries as an efficient contribution to food self-sufficiency and to industrialization. He encouraged the participants to make all possible efforts to achieve specific and feasible objectives during the Meeting.

### Election of officers

Israel Mahler, Member of the Board of the National Institute of Industrial Technology of Argentina was elected Chairman. Apolonio V. Bautista, Assistant Minister in the Ministry of Agriculture and Food of the Philippines, and Ahmed Alaoui Abdellaoui, Secretary General of the Ministry of Agriculture and Agrarian Reform of Morocco were elected Vice-Chairmen. Jorge Pastrana, Director of the Metal-Mechanic Industry of Mexico was elected Rapporteur.

### Adoption of the agenda

The Meeting adopted the following agenda:

Opening of the Meeting  
Election of the Chairman, Vice-Chairmen and Rapporteur  
Adoption of the agenda  
Statements by the heads of delegations  
Bilateral and group discussions of co-operation projects  
Adoption of the draft report of the Meeting  
Closure of the Meeting

### Adoption of the report

The Meeting adopted the draft report at its last plenary session on 7 November 1986.

### Closure of the Meeting

During the closing session of the Meeting, the Chief of the Section for Economic Co-operation among Developing Countries of UNIDO thanked the Argentine authorities and the people of Argentina for having hosted such a Meeting and praised the excellent organization on all levels. He then referred to the fact that the participants from developing countries and the Argentine entrepreneurs were happy with the results achieved which was, in his opinion, the most important aspect of the event. He further stated that the main responsibility for implementing the agreements reached during the Meeting remained with the participants themselves. However, he continued, UNIDO - within its limited resources - was ready to assist whenever possible with the effective follow-up action to be taken after the Meeting by the countries concerned.

He thanked the delegate from Algeria for having invited all the participants to the Algerian Fair (to take place from 17 to 25 June 1987) and to devote one day just to developing countries to analyze the follow-up of the results of the Buenos Aires Meeting which constituted not only an opportunity for the participants to review once more the ideas and agreements discussed and decided upon at this Meeting, but also an interesting built-in mechanism of follow-up for the Buenos Aires Meeting. He finally referred to the fact that the optimism felt by the participants in this Meeting should not be an end in itself since there was still a lot to be done in order to establish effective co-operation among developing countries.



The Under-Secretary of State for International Co-operation in the Ministry of External Relations of Argentina expressed the satisfaction of his country for hosting such a Meeting due to the extraordinary importance of strengthening the links of South-South co-operation, especially during times when developing countries were facing great difficulties.

He referred to the fact that one of the main objectives of Argentina was to give an impulse to world co-operation with special emphasis on co-operation among developing countries, placing at the disposal of all participants the experience of Argentina in the field of agro-industries, including agricultural machinery. He said that the Government of Argentina relied very heavily on its private sector to achieve the above results.

He finally exhorted UNIDO to continue this type of exercise, which in his view was of utmost importance for developing countries, irrelevant of their stage of development.

The Assistant Minister in the Ministry of Agriculture and Food of the Philippines, after thanking all the parties concerned with the organization of the Meeting, praised the Argentine participants as well as the delegates for making the Meeting a successful event. He especially thanked UNIDO for having organized such an event in a most practical manner and hoped that meetings of this type would continue to be held in the future.

The delegate from Jamaica thanked the Argentine authorities and UNIDO for organizing the Meeting. He further stated that as he was an entrepreneur himself, he noted with great satisfaction that the participants were able to have concrete business discussions with other entrepreneurs and he sincerely thanked UNIDO for this opportunity.

The Chairman closed the Meeting by referring to the fact that the objective of the Meeting had been completely achieved. He especially thanked the delegates and the Argentine entrepreneurs for their extraordinary efforts which had brought prestige to this event. He stated that it was now up to the participants themselves to carry on the fruitful dialogue initiated in Buenos Aires in order to achieve concrete results. He said that UNIDO had done its part in a most efficient manner and he was sure that UNIDO - within its limited resources - would do its best to continue to assist whenever possible with the follow-up of this event.

## II. SUMMARY OF STATEMENTS DELIVERED AT THE PLENARY SESSIONS

### Statements made by heads of delegations

In his address to the Meeting, the representative of the Sectoral Studies Branch of UNIDO described briefly the work of the Branch on the agricultural machinery and implements (AMI) industry in developing countries. He then asked participants to elaborate on the problems of the AMI industry in their respective countries by granting him an interview and additional more detailed follow-up information in response to three questionnaires prepared by the Sectoral Studies Branch for the Meeting.

#### Argentina

The National Director for Promotion and Co-ordination of the National Institute of Industrial Technology (INTI) of Argentina said that for the last 100 years approximately, Argentina had evolved towards a farming-based economy and in the first decades of the present century, it had a privileged position worldwide. During that period, the country enjoyed an important economic and industrial development and agricultural machinery played a significant role in the metal-mechanic industry, mainly made up of small- and medium-sized national enterprises manufacturing spare parts and components for drawn implements especially ploughs, seeders, mowers, rakes and so on. Harvesters were among the most complex machinery manufactured in the country and they had gradually replaced fixed "steam" threshing machines.

He further went on to say that in 1929, the first motor harvester in the world was registered in Argentina. World War II had contributed to an increase in import problems related to agricultural machinery and encouraged national development of this sector. At the beginning of the fifties, this industry had started to manufacture agricultural machinery using the design of imported equipment as a starting point. In the sixties, equipment for the application of herbicides, forage silage machinery, potatoe harvesters, etc., made their appearance on the market and research work using models of different origins started to spread, giving way to a steady application of adapted technology. As of the seventies, innovations were made by local firms.

He pointed out that the different characteristics of agricultural production in Argentina and its geographic extension with such a wide range of soils and climates compelled the agricultural machinery industry to develop equipment adapted to the requirements of high productivity and flexibility. Argentina regularly exported its agricultural machinery to Bolivia, Brazil, Colombia, Costa Rica, Cuba, Chile, Ecuador, Guatemala, Mexico, Paraguay, Peru, the Dominican Republic, Uruguay, Venezuela and Africa.

He stated that at present, Argentine enterprises were carrying out research work and were developing innovations with the active support of producers and experts of the National Institute of Farming Technology (INTA). The National Institute of Industrial Technology (INTI), co-operated actively with manufacturers, rendering specialized assistance in metrology, heat-treatments, foundry methods, mechanical tests, quality controls, etc. The industrial apprenticeship programme which started with scarce technical and monetary resources added to the need for meeting large and varied production demands in a country with large land expanses and low population density, and this had resulted in tough, reliable and durable equipment requiring scarce maintenance.

He concluded that Argentina was a country with a relatively advanced stage of industrialization and was now in a position to transfer its technology abroad through different forms of co-operation to be agreed upon among the parties, such as: Technological assistance and training projects, joint ventures, progressive production integration, turnkey jobs, productive exchange, human resources, training, etc. He indicated that this was merely an illustrative though not exhaustive list of co-operation possibilities that could be taken into account in order to realize a new stage of co-operation among developing countries.

### Algeria

The Director-General of the National Enterprise for the Production of Agricultural Machinery of Algeria stated that agriculture in Algeria since the end of the colonial era (1962) had inherited a very low mechanization rate: 0,1 HP per hectare; 1 harvester for 6 500 hectares. Agricultural machinery was being essentially produced in two plants for the assembly of tractors without local integration. This production experienced an increase from 1967 due to the launching of the industrialization process in Algeria. As an example, he made mention of the Constantine Tractor-Motor Complex (3 600 employees) and the Fifi Hel Abbs Agricultural Machinery Complex.

He pointed out that at present, production was around 80 000 tractors, 50 000 of which were produced in Algeria, and of the 8 000 harvesters/threshing machines in the country, 4 500 were manufactured locally. Since 1984, Algeria had been exporting agricultural machinery and implements to Tunisia and Yugoslavia.

In closing, he mentioned that industrial co-operation with other developing countries was currently being implemented and cited as an example the joint establishment with Tunisia of a factory for the production of diesel motors, indicating that other projects were also being studied.

### Brazil

The Co-ordinator of the Sub-Programme of Agricultural Engineering of the Institute of Technological Research (IPT) of Brazil stated that the Brazilian agricultural machinery industry had started in 1960, closely related to the establishment of the tractor industry in the country. He said that today, there were about 600 small- and medium-sized firms concerned with the production of agricultural implements and that there were some large manufacturing companies producing tractors and combine harvesters. He went on to say that foreign capital played an important role in these companies, sharing or controlling them completely. In order to improve the technological level of the small- and medium-sized national firms, the Brazilian Ministry of Industry and Commerce was in charge of a national technological programme encompassing the following three basic elements:

- product engineering;
- manufacturing engineering, and,
- "basic technology" (standardization, industrial quality and technical information).

He went on to say that activities in the field of "basic technology" were most important at the moment. Since 1973, Brazil had been building up an appropriate framework for metrology, standardization and industrial quality.

He explained that currently, an effective effort for standardization was being carried out in order to assist agricultural machinery manufacturers. Huge efforts concerning quality certification, mainly for agricultural tractors, were also being undertaken. Brazilian experience in the field of "basic technology" could be used to start co-operative technological programmes together with other developing countries on:

- Technical standardization;
- Information exchange of technical requirements to fulfill farming needs;
- Exchange of qualified people for training in machinery testing (before sale) and quality certification.

### China

The Vice-Minister of the Ministry of Machine Building Industry of the People's Republic of China stated that China was a country with an area of approximately 9,6 million square kilometres of which 100 million hectares was farmland and about 353 million hectares was pastureland. Rural residents accounted for 81 per cent of the Chinese population of 1,03 billion. In 1985, the output of grain had totalled 378,98 million tonnes. The Chinese government had attached much importance to the development of agriculture and had taken a series of measures to apply modern technology to agriculture. By the end of 1985, the power capacity of the agricultural machinery industry in China had amounted to 284 million HP.

He went on to say that in recent years, China had imported more than 70 kinds of advanced technology. A number of Chinese agricultural machines, particularly the small ones, had reached an advanced level of development. He described the principles for the development of the agricultural machinery industry in China which were:

1. Meeting the requirements of different local conditions.
2. Mainly developing medium- and small-sized machinery to meet the household farming demands of the vast countryside. The production of large machinery was also being developed.
3. Meeting the requirements of a diversified economy, including agriculture, forestry, animal husbandry, sideline production and fisheries.
4. The provision by the Government of the necessary financial support for the production of the machinery.

In conclusion, he stated that as a developing country, agricultural production and the agricultural machinery industry in China were similar to other developing countries in many respects. There was a promising future for bilateral and multilateral co-operation. China had not only imported farm machines, but had also exported more than 300 types of farm machines and helped some developing countries to establish agricultural machinery plants. The various departments in China in charge of the agricultural machinery industry, enterprises and research institutions were willing to co-operate with other countries and some international organizations, and reference was made to the three workshops held since 1978 on the designing of agricultural machinery, which were jointly sponsored by UNIDO, the Government of China and ESCAP.

## Egypt

The Chairman of the Mechanization Company of the Ministry of Agriculture of Egypt stated that according to the Egyptian plan to obtain the maximum agricultural yield with reasonable prices, mechanization had been essential, and to ensure the successful implementation of mechanization, Egypt had already started out in this industry in the fields of tractor production and the manufacture of attachments such as ploughs, land-levellers, rotovators and trailers as well as water pumping units and parts used for sprinkler and drip irrigation. He said that Egypt sought further co-operation with other countries in many fields to produce complete lines of non-traditional crops such as potatoes, sugar beets, cotton and forrage. He went on to say that Egypt also intended to co-operate to produce back hoes, loaders, ditchers, mould board ploughs and disc harrows and that mowers and fertilizer distributors were also required. Co-operation was also required to support the creation of a feed industry to provide the basic agricultural machinery based on local raw materials and main parts already produced in Egypt. He concluded that due to the importance of the agricultural machinery industry, all the studies, projects and data concerning this subject were available at the Mechanization Research Institute at Giza and that further details or information could be obtained from that Institute.

## Guatemala

The Deputy Director of Agricultural Services of Guatemala stated that according to investigations carried out in his country, there were no specific surveys regarding the development of the agricultural machinery industry and its present situation, nor were there well-defined policies at the national level aimed at strengthening the production of tillage machinery and equipment in an organized and systematic way. He said that although the industrial sector had experienced relative boom periods, it had also faced critical situations which had negative effects on the sector. The creation of the Central American Common Market had become the driving force of industrial activities.

He went on to say that industry in general had experienced modest development since its structure and degree of integration were those of a scarcely developed country. Production in the industrial sector was characterized by a higher output of perishable consumer goods which represent more than 50 per cent of the industrial production. The production percentage of agricultural capital goods was under 1 per cent of the overall production of capital goods. He pointed out that considering that this 1 per cent also included non-agricultural machinery, the greatest portion of the agricultural capital goods industry was mainly devoted to producing tillage equipment (grub hoes, etc). The scarcity of available financial resources in the country had made it difficult to obtain imported inputs and this had also led companies to operate with a low utilization of their industrial capital. He explained that the industrial sector had been extensively affected by problems of both domestic and foreign origin. Scarce growth and poor diversification of industrial product supply in general were due to the following restrictions:

- Domestic limitation of total investments - both private and public - as well as reduction of foreign investments.
- Scarce skilled labour.
- External vulnerability of the sector (technological dependence, bad financing and purchase of industrial inputs).

- Low degree of industrialization.
- Scarce growth in the demand for industrial products.

In conclusion, he stated that Guatemala had recently established the new "Central American Customs, Duties and Tariffs System" which encouraged the import of raw materials for industry. In addition, two further instruments were in force:

- The Law of Incentives for exporting industrial companies.
- The Law of Promotion of industrial decentralization, mainly aimed at those companies operating under industrial benefits.

Both of these laws granted fiscal benefits.

### Guinea

The representative of Guinea, Engineer in the Division of Studies and Industrial Promotion, stated that the Republic of Guinea had an area of 245 857 square kilometres and approximately 6 million inhabitants with a population density of around 24 inhabitants per square kilometre. About 70 per cent of the population lived in the rural areas. He went on to say that agricultural activities had a low level of mechanization and that 85 per cent of the activities were carried out by hand, 10 per cent by animal traction and 5 per cent by tractor-drawn equipment. He said that due to the population growth rate of the country and the rate of rural migration, it was necessary to develop the agricultural machinery sector. Projects required to develop the agricultural machinery sector were the following:

- Rehabilitation of U.S.O.A. agricultural implements factory at Mamou and if feasible, to turn it into a unit for manufacturing simple agricultural machinery such as ploughs, seeders, sprayers, mowers and so on.
- The establishment of companies devoted to the assembly of agricultural machinery which would be entrusted with the on-site installation of tillage machinery, seeders, vegetable protection and maintenance machinery as well as tractor-drawn harvesters.
- Assistance to the pilot centre with regard to the production and repair of agricultural machinery as well as training of staff.
- Assistance to the pilot centre in order to transfer technology for the production of agricultural machinery.
- Research, production and promotion of agricultural machinery envisaged and implemented in the western African subregion in particular, and in some other areas of the country in general.

### India

The Officer on Special Duty of the Ministry of Industry of India stated that prior to independence, India had been a primarily agrarian economy dependent on the vagaries of the monsoon and food shortage was perennial. After independence, steps had been taken to increase food production: The extension of irrigation had increased supplies of high-yielding varieties of seed and the introduction of agricultural machinery were the important steps that had been taken in this direction. As a result, agricultural production had gone up from 30 to 85 million tonnes in the early sixties to 160 million tonnes in the eighties. He explained that India had now emerged

as a net exporter of food grains due to the success of what was called the "Green Revolution". The introduction of various mechanical agricultural implements had seriously started in the 1960's with improved types of pump sets, power tillers and tractors which were later followed by wide usage of threshers, combine harvesters, front-mounted tractors, drawn reapers, groundnut diggers and shakers, potato plants and so on. He went on to say that the production of tractors currently amounted to 85 000 tonnes and was expected to almost double by 1990.

He said that India had developed to one of the major manufacturers of agricultural equipment by taking appropriate technology from the best sources and adapting it to suit Indian conditions. He explained that India did not consider it necessary to produce as large volumes of output as developed countries since economy in production costs was largely dictated by product design, investment and labour intensive general purpose manufacturing methods with lower costs. In addition, for developing countries, inexpensive low horse power tractors and other agricultural equipment which could be easily maintained, serviced and individually owned was more suitable.

He concluded that in order to maintain quality and competitive prices, more than one manufacturing unit would be preferable and that for the development of an indigenous agricultural machinery industry, some Governmental support and preference was essential. He pointed out that proper development of managerial skills and other infrastructure was also vital.

#### Jamaica

The representative of Jamaica stated that his country covered an area of approximately 144 square miles and had a population of about 2.5 million. Agriculture and agro-industries included: Sugar cane, bananas, coffee, horticulture, pimentos, citrus, winter vegetables, fisheries, rice, bauxite and mining. He explained that agriculture/farming was owned almost equally by the Government and the private sector and that this was due to the location, proximity and economic position of Jamaica. Agro-equipment and machinery was mainly imported from the United States and Canada through lines of credit and so on at the Government level and multiple arrangements at the private sector level. He said that Jamaica did not manufacture any agricultural machinery except for some basic hand tools and that the country was constantly searching for spare parts and thus welcomed substitute spares from the participating countries in the Meeting, provided prices were competitive and supply consistent.

He continued by saying that the Jamaican bauxite industries were mainly owned by North American companies who supplied and serviced most of their own plants and machinery. Gypsum and limestone mining also formed a great part of production for local use and for export. As Jamaica did not produce energy, it was constantly exploring methods of conservation and studying ways to substitute the use of coal for electricity. He cited the example of the pilot project at the National Cement Plant. Energy from coal technology was therefore of great interest to Jamaica for both mining and agro-industries. Jamaica therefore welcomed dialogue with other countries on machinery and/or equipment to suit all the above areas of agriculture and agro-industries with a view to maintaining and modernizing its present stock.

### Mali

The Chief of the Division of Agricultural Machinery of Mali stated that seventy per cent of the peasants in his country were still using hand tools and that in 1928, the first animal-drawn plough had been introduced into the country followed by the first tractor in 1945. In 1960, the country had become independent and priority had been given to animal traction. In 1962, the Division of Agricultural Machinery had been introduced to be in charge of agricultural machinery mechanization. He continued by saying that as far as the inventory of material in the country was concerned, there were at present 2 000 tractors of every kind and 150 000 tool chains for animal traction. The existing agricultural machinery facilities in Mali were:

- A unit for the manufacture of animal traction material created in 1974 and handled by a joint public/private company.
- Two private foundry workshops for the manufacture of harvesting machine discs.
- Several workshops devoted to the manufacture of trailers.
- A certain type of craftsmanship was being organized, especially with regard to foundries, to manufacture animal traction spare parts and some complete equipment.
- A simplified tractor mounting workshop was at present being installed.

### Mexico

The Director of the Metal Mechanic Industry of Mexico stated that Mexico had reached a certain degree of development with respect to agricultural machinery and implements but that it was at present undergoing a difficult situation. All companies in the agricultural machinery sector were operating under capacity and were facing severe financial problems due to the recent drastic drop in the domestic market. Nevertheless, though somewhat limited, the development of agricultural machinery was focussed around technologically more advanced products. He added that in the industrial promotion programme, agricultural machinery was one of the highest priorities. Thus, it was being strongly supported with fiscal incentives and access to credits. He pointed out that the national industrial development policy aimed at achieving a higher degree of integration and important progress had been achieved. He also stated that there were foreign exchange restrictions on imported spare parts which was due to inadequate exports.

### Morocco

The Secretary General of the Ministry of Agriculture and Agrarian Reform of Morocco stated that agricultural mechanization in his country was characterized by insufficient output of tractors, generally only of a lower HP capacity and by a lack of diversification of ancillary equipment. He explained that this situation was the result of the fact that most farmers lacked the necessary financial resources and in addition, land was divided and sub-divided into smaller units. He said that the Government was gearing its efforts towards the development of agricultural mechanization and was trying to adapt to its territorial structure, favouring minor mechanization. Towards this end, the following incentive schemes were implemented by the Government:

- Tax-free import of tractors and agricultural machinery;
- Subsidies for acquisition: 10 to 20 per cent according to the type



of product and depending on whether the purchaser was an individual or co-operative;

- Agricultural credit allowing the financing of up to 70 per cent of this material overall value.

### Pakistan

The Chargé d'Affaires of the Embassy of Pakistan stated that agriculture was of utmost importance in his country as could be seen from the fact that 72 per cent of the 91,9 million people lived in villages. He said that agriculture provided 26,4 per cent of GDP and 45 per cent of exports. The agricultural growth rate during 1978 to 1983 was 4,9 per cent. He stated that in addition, Pakistan had moved towards self-sufficiency in wheat and sugar production and exported rice, cotton, fruits and vegetables. Pakistan possessed great potential to initiate and sustain industrial development based on the utilization of raw material wastes and surpluses from such crops as rice, wheat, sugar-cane and cotton. He went on to say that there was great scope in the fruit and vegetable processing industries due to increased income, which was likely to cause people to switch over to fruits and processed food. Scope also existed for improved animal drawn implements. He concluded by saying that Pakistan would welcome foreign investment in joint ventures to manufacture agricultural machinery and implements such that:

- a) Manufacturing had a phased local production/delegation programme whereby in 5 or 6 years, total manufacturing would take place in Pakistan.
- b) Foreign collaborators would undertake to buy-back the surplus over the domestic market.

Finally, he indicated that proposals with an export element, to the extent that at least the cost of imported inputs could be met through exports, would be preferred.

### Philippines

The Assistant Minister of the Ministry of Agriculture and Food of the Philippines stated that his country had many problems with agricultural mechanization, ranging from manufacturing, marketing, proper use, better servicing of equipment and spare parts to repair machines. Farmers were mostly small farm holders who had very different requirements from the sugar cane, pineapple and banana plantations. He said that although the unemployed in the rural areas had to be given work and that their labour could not be replaced by machines, it was only with the use of machines and better farm equipment that the Philippines could hope to produce cheaper farm products that could sell competitively. He went on to say that it was hoped that the experience of the Philippines and the future exchange of ideas and commercial ventures would help the country in the formulation of agricultural mechanization policies and strategies for better and faster rural industrial development. He concluded that as a result, the Philippines hoped to be able to strengthen the existing institutional framework and mechanization for carrying out the national integrated programme of mechanization development.

## Senegal

The Secretary General of the Ministry of Rural Development of Senegal stated that since its independence, Senegal had undertaken an intensive policy for supplying factors of production to its rural population, especially agricultural machinery. In 1960, a national company (SISCOMA) had been established to undertake the manufacture of material for the rural population. In addition, a method of providing financing and support had been created and implemented. The Government had prepared the agricultural programme, financed by a national development bank (BNDS) to cover financial needs. For material support, the national supply company (ONCAD) acted as the link between co-operative agencies and the BNDS, which furnished the bank with the information about the needs of those co-operative agencies so they could be granted the required financing. He explained that the co-operative agencies were responsible for financial matters: They allocated money and work (in conjunction with ONCAD) to recoup costs. This system had worked for twenty years and had allowed the peasants to count on equipment for seeding, harvesting and tillage of their lands, but the credit given out had not been repaid. He explained some of the reasons for this: The peasants had not felt really responsible for the credit and had considered this matter as exclusively concerning the co-operative agencies. In addition, a series of droughts had considerably decreased the purchasing power of the rural population. As a result, 20 billion CFA had not been repaid and no other type of refund could be obtained. In this way SISCOMA (which had 80 per cent of its production within this system) had started to lose its most important market. In 1978, it had been liquidated and replaced by a smaller company (SISMAR). As of that time, the Government had no longer played the role of intermediary for the financing and supply of implements.

He went on to say that the peasants themselves had then - either individually or collectively - to meet their needs through SISMAR, a bank or any other company on the market. He concluded that the experience of the past twenty years had resulted in a rural population that was well provided with basic agricultural machinery. However, there was a need for more complex machinery despite the fact that some companies imported these machines.

## Venezuela

The Director of Agricultural Planning of Venezuela stated that within the framework of the Seventh National Programme, agriculture played a highly significant role and he pointed out that the implementation project aimed at "strengthening agriculture as an economic activity with the highest priority" and sought to make this sector more dynamic. This had an important effect on the generation of employment, developed food supplies and improved the standard of living of the rural population. He said that in order to achieve these aims, modern technology was required to use the resources available in a more rational way and that this led towards a system of agriculture where machinery was of vital importance. He explained that the strategic development of the capital goods industry in Venezuela was based upon the articulation of industrial complexes devoted to the manufacture of the equipment used by all sectors. He continued by saying that the solution was not only centred around multi-production companies, but was also centred around specialized enterprises that could mutually supplement each other. Therefore, the articulation of industrial complexes in terms of the production of the different sectors became a necessity to develop the capital goods

industry. He concluded that Venezuela had sufficient manufacturing supply and was in a position to meet the demands for those produces that were at present being produced. He said that all possible efforts had to be undertaken in order to achieve a better supplementation among the companies, as well as to tackle the production of implements and machinery for tropical products - a sector where Venezuela had competitive advantages.

### Yugoslavia

The representative of Yugoslavia, the Director of the Joint UNIDO/Yugoslavia Centre, stated that the selection of agricultural machinery projects for discussion between developing countries was appropriate given that developing countries only produced six per cent of world production. He said that on the other hand, there were a number of more advanced developing countries that were in a position to provide relevant and meaningful assistance to less developed countries to strengthen production of agricultural machinery, research and development capabilities, the transfer of technology and the expertise and skills of the labour force. He added that Yugoslavia felt that at present, co-operation among developing countries was mainly restricted to interregional trade and not production. It was thought that more emphasis should be placed on industrial and other more stable forms of co-operation.

He explained that the production programme of agricultural machinery in Yugoslavia was rather wide. It was intended to cover the need for machines and equipment for different crops and animal husbandry. It was also designed to cover basic needs for machines and equipment of small farmers (average of 3 hectares per household) as well as large agro-industrial estates and co-operatives. He said that export of tractors and agricultural machines was in the range of 60 to 80 million US dollars per year and that most exports were on a commercial basis. However, some of the leading producers had entered into various forms of industrial co-operation with India, Egypt, Pakistan, Iran and Tanzania.

He said that Yugoslav producers were particularly interested in:

- Industrial co-operation including assembly production of agricultural machines, implements, parts and components thereof;
- Supply of machines, farm equipment, spare parts, etc.;
- Supply of production equipment and of infrastructure;
- Elaboration of studies, design and engineering in the establishment, expansion and/or rehabilitation of the existing production facilities;
- Training of technical, managerial and other personnel;
- Other consulting services.

He concluded by saying that Yugoslav institutions were ready to consider industrial co-operation and the supply of machines within the available resources, as well as joint ventures and other forms of co-operation.

### III. BILATERAL DISCUSSIONS ON CO-OPERATION PROJECTS

#### Discussions between Argentina and Algeria

The main contacts established with one firm were centred around the possibility of exporting agricultural machinery - mainly atomizers and sprayers - to Algeria. The equipment from Argentina would suit the needs of Algeria perfectly since both countries have similar crops such as citrus, grapes and olives. The main subject of discussion was the possibility of Argentina supplying the Algerian market with equipment, since Algeria would demand about 1 000 pieces of equipment annually. This could be carried out through a co-operative arrangement between two companies. The Argentine representative was invited to Algeria to attend the Agricultural Machinery Fair to be held in June 1987. This first verbal invitation would be followed up by telex and possibly by a visit to Algeria. The two sides agreed to send the background information and documents required immediately in order to enable the Argentine representative to attend the fair, so that a preliminary agreement could be prepared for the manufacture of sprayers and atomizers based on a ratio of 40 to 50 per cent of Argentine material and the remaining portion to come from Algeria.

With another firm, several other projects were discussed, namely:

- a) A unit for the manufacture of agricultural machinery with an estimated investment of 23 million US dollars to produce 13 470 units of tilling equipment and 3 000 units of equipment to cultivate potatoes. Starting date: 1990.
- b) A unit for the manufacture of irrigation equipment, seeders and treatment machines. Production is to start in January 1989.

Algeria requested the loan of some equipment on a temporary basis so it could be tested and evaluated in Algeria.

#### Discussions between Argentina and Brazil

##### HILCOR (Argentina) - ESALQ (Brazil):

A technical co-operation project for a feasibility study to manufacture coarse and fine grain seeders was discussed (possible joint ventures, setting up of a plant in Rio Grande do Sul). It was agreed that HILCOR and INTI would jointly undertake the study of the legal aspects regarding patents and other conditions (within the next 30 to 60 days). Further it was agreed that ESALQ would prepare a schedule of visits and contacts in Brazil, with experts from Brazilian enterprises in the fields of soyabean, wheat and other products (the visit was scheduled to take place from 5 to 15 December 1986). It was decided to come to an agreement between INTI, HILCOR and ESALQ on this subject.

##### FERTILAR (Argentina) - ESALQ (Brazil)

Discussion of a technical co-operation project to carry out a feasibility study aimed at manufacturing in Brazil deep-working fertilizer equipment: Either trailed or mounted on three points. ESALQ agreed to analyze the technical feasibility for the use of this equipment in the production of sugar cane, corn, dry beans, and so on. ESALQ would supply the technical information to carry out the tests required to make technical assessments.

FERTILAR agreed to study with INTI the legal conditions in force, particularly as regards patents and transfer of technology. In case the results were positive, a technical co-operation programme would be established in order to introduce this equipment with the assistance of Brazil. Both parties involved agreed to put forward to UNIDO a financial support project to carry out this co-operation agreement, through transfer of technology or a joint venture.

DAT (Argentina) - IPT (Brazil)

A technical co-operation project on technical norms and support services to small-/medium-scale industries as well as the transfer of technology was discussed. IPT would send within 30 days technical information to DAT on agricultural machinery so a co-operation programme between the two institutes could be drawn up.

Discussions between Argentina and China

A meeting was held between the Chinese delegation and the President of INTI. During the meeting, the delegation gave a short introduction on the development of the agricultural machinery industry in China and presented some documents and catalogues. The delegation expressed the hope that co-operation in the production of agricultural machinery between China and Argentina could be developed. The Chinese delegation welcomed the Argentine entrepreneurs to visit agricultural machinery plants in China and to discuss the possibility of co-operation. The representative of INTI briefed the delegation on the development of the agricultural machinery industry in Argentina and reiterated the interest of Argentina in strengthening co-operation with China. Several other contacts were established with Argentine entrepreneurs.

In addition, discussions took place between the Chinese delegation and the president of Industrias Agromecanicas SALTA. The two sides exchanged views on co-operation regarding mini hydro-power equipment and wind pumps required for the development programme for the mountainous area, Salta. Both sides agreed to have further contact in the future.

Discussions were held between the Chinese delegation and the representative of the enterprise Haupt Sao Paulo SA. There was a fruitful exchange of information and the possibility of buy-back arrangements was discussed. Further discussion may take place during the extended one-week stay of the Chinese delegation in Argentina.

Finally, discussions were held between the Chinese delegation and the representative of the enterprises Zanello and Temtlar. They briefed each other on their machinery and exchanged the relevant documents for information. They expressed their desire for co-production of tractors and implements. The discussions would continue during the extended one-week stay of the Chinese delegation in Argentina.

### Discussions between Argentina and Egypt

Discussions took place between the delegate of Egypt and the representative of CONDOR-BATTISTINI SA of Argentina. The projects discussed were the following:

1. Tomato processing line: Paste manufacturing, peeling and crushing. Packing.
2. Apricot processing line and packing.
3. Vegetable freezing line.

The Argentine enterprise handed over some preliminary draft projects to implement the above-mentioned suggestions. Both parties agreed to exchange technical information by correspondence.

Several other discussions were held concerning:

1. The assembly of a combine harvesting unit produced in Argentina as a joint venture in Egypt. Further technical and economic data would be sent to Egypt within two weeks.
2. Co-operation in the field of tractor production, especially high-powered tractors produced in Argentina of between 80 and 100 HP. More details regarding, among others, prices and spare parts would be delivered through direct contact between the two sides.
3. Agro-industrial projects dealing with the production of fresh juice and paste, and both sides agreed to begin with tomatoes, citrus and guava. An invitation would be sent to the Chairman of the Egyptian company specializing in this field by the end of November and this project could be implemented in 1987.
4. Both sides discussed seed cleaning and grading units and concluded to begin with the units concerning wheat. A detailed offer would be sent from Argentina. The project could be implemented in 1987.

### Discussions between Argentina and Guatemala

#### Project no. 1

To envisage technical training programmes for material testing and quality control. This programme must foresee the sending of qualified personnel to give courses and also the possibility of training personnel selected by the Government of Guatemala at the appropriate institutions in Guatemala and at DAT (Argentina).

#### Project no. 2

Guatemala requested several companies located at Santa Fé to send details about prices and technical data on machinery production in order to import these products. The enterprise DAT of Argentina would undertake the implementation of this project.

Project no. 3

The feasibility of obtaining manufacturing licenses from Argentine enterprises for the local manufacturing of tillage machinery (grub hoes, spades, etc.)

Project no. 4

To obtain manufacturing licenses from Argentine enterprises to be used in the local manufacture of spare parts (simple manufacturing) for irrigation pumps and then proceed with the final assembly of imported parts.

Project no. 5

To obtain licenses from Argentine enterprises to manufacture different types of corn threshing machines.

Project no. 6

To obtain licenses from Argentine companies to be used in the local manufacture of spare parts for animal-drawn tractors at low cost, and to proceed then with the final assembly of imported parts.

Project no. 7

To request the assistance of UNIDO to set up small laboratories intended to supply technical assistance to local companies.

With regard to projects 3 through 6, specific proposals would be sent to Guatemalan enterprises or co-operatives. The Government of Guatemala would co-ordinate the transfer of technology and promote private initiatives through industrial promotion laws.

Finally, with an Argentine enterprise, the following was discussed, and preliminary drafts were handed over:

- Tomato processing and packing: Peeling, paste and pulp.
- Melon marmalade processing.
- Pineapple processing and packing.
- Concentrated apple juice.

Both parties agreed to exchange technical and economic information by correspondence.

Discussions between Argentina and India

The Argentine side was represented by Agrometal SA, and a project regarding the transfer of technical information on specialized ploughs, discs and shovels developed by Argentina was discussed, in order to study their suitability for Indian conditions. The Argentine enterprise agreed to supply technical information required to carry out the feasibility study for this purpose.

Other discussions took place and Argentina offered to India its know-how in diverse fields such as seed selectors, various types of discs and disc blades, plough bottoms, shaves, shins, chisel shanks, tins for seed bed preparation, etc. It was agreed that technical details provided for these would be studied by the Indian side and depending upon requirements and suitability, Argentine companies would be contacted. It was decided to pass on the requirements of the countries concerned to the agencies dealing with them in India and then to follow it up once these contacts were established.

#### Discussions between Argentina and Jamaica

The following projects were discussed between the two parties:

1. Machinery for cutting, drying and transportation of coffee was discussed with the representative of Argentina, President of Industrias Agromecanicas SACIFA of the Province of Salta.

2. Tractors and harvesters were discussed with the representatives of FIAT AGRI Argentina.

3. Tractors and harvesters were also discussed with the Commercial Director of DEUTZ Argentina.

4. Regarding tractors, Jamaica expressed its interest in importing tractors or some tractor parts and diesel motors from Argentina. Jamaica promised to send detailed information on quantities, types and required models as well as conditions of payment and financing by 15 December. Argentina agreed to study in detail the possible existing credits to conclude the business.

5. Machines and construction material and leather and leather products were also discussed. Concrete possibilities of export to Jamaica were analyzed.

6. Agricultural machinery: Both countries compared their existing machinery and a detailed conversation was held on ways and means of financing and possible joint ventures. In the case of coffee production machines, Argentina would wait for the final report on this matter from Jamaica. Discussions on the possibility of producing certain types of spare parts and especially of a maintenance service and training programme in this area were discussed in detail. A time-table for three visits to Jamaica by Argentine experts to enable them to see this machinery operating in loco was planned. At that time, a meeting with the Ministry of Agriculture of Jamaica would take place to establish a full programme on this matter. Information from both sides would be exchanged within the next 2 to 3 weeks.

7. Discussions with FERTILAR SA concentrated on fertilizer spreaders specially adapted to distribute deep-action fertilizers on sunflowers, maize and soya beans (about 4,5 metres wide). Special equipment for tractors to distribute deep-action fertilizers specially designed for fruit and vegetables (apples, onions, tobacco, coffee, between 1,10 and 1,40 metres wide) was also discussed. FERTILAR was ready to export its equipment for commercialization in Jamaica and other Caribbean countries. Moreover, FERTILAR assured its readiness to secure the required spare parts.



### Discussions between Argentina and Mali

The following projects were discussed:

1. With Industrias Agromecanicas de Salta the possibility of the supply of animal-drawn equipment was discussed.
2. Technical assistance on research and training of human resources in agricultural machinery was discussed with the Dirección General de Asesoramiento Técnico de Santa Fé.
3. The supply of special parts for disc mould board ploughs, cultivating machines and shovels was discussed with Agrometal-Ingersoll - Magaria SA.

The Argentine enterprise would send technical information and price lists of the required material so the respective economic study could start. The Mali representative requested the assistance of INTI starting from December for the above. The Mali representative indicated that he would present a project to UNIDO by December for assistance requesting DAT intervention as far as technical experts were concerned. Argentina promised to send the relevant technical information and price lists and these would be disseminated to the specialized agents in Bamako.

### Discussions between Argentina and Mexico

Discussions took place on the supply of technology and/or equipment to manufacture grain dryers and roto-bailers, aimed at establishing a joint venture to supply the domestic market and also for export to the USA. Both sides agreed to continue contacts in order to exchange the required information for the pre-feasibility and feasibility studies to set up the plant.

### Discussions between Argentina and Pakistan

Projects for the transfer of technology and training of Pakistani personnel were discussed in the following fields:

1. Manufacture of trailed equipment to distribute deep-action fertilizers (sunflower, corn, soyabean, etc.), 4,50 metres wide.
2. Manufacture of tractor mounted equipment with three outlets to distribute deep-action fertilizers, mainly to be applied to apple trees, grapevines, tobacco plantations, onions and so on, 1,10 to 1,40 metres wide.

Both parties agreed to exchange further information by correspondence.

### Discussions between Argentina and the Philippines

Argentina was interested in selling grain separators, dryers and farm equipment. In addition, the Dirección General de Asesoramiento Técnico (DAT) offered to explore the possibility of technical exchange with the Philippines. The Philippines was very interested in this offer. The Philippines believed that the technical experience of DAP would be of great help to the Filipino farm equipment manufacturers.

### Discussions between Argentina and Senegal

Discussions with two Argentine industrial groups took place and several ideas were developed. A project was discussed on the feasibility of carrying out a joint venture in Senegal for the production of disc units, mowers and so on. The Government of Argentina could open a line of credit to this effect.

Discussions with INTI took place on the possibilities of industrial technical co-operation in several areas with the Agricultural Research Institute of Senegal (ISRA). Interest in the implementation of joint ventures or the establishment of co-enterprises in Senegal was shown by both parties. It was agreed that Senegalese private enterprises involved would have to be contacted in order to consider - together with their partners - the possibility of materializing these ideas.

### Discussions between Argentina and Venezuela

1. Discussions were held with Carlos Mainero y Cia SA, who had just initiated some commercial contacts with Venezuela, and were primarily interested in exporting machinery and implements to that country. They also expressed interest in joint projects with Venezuelan enterprises in the areas of seeders, diggers and other machinery. They were especially interested in this aspect due to the geographical position of Venezuela with regard to the Caribbean and Central American markets. The Argentine company agreed to submit information regarding the equipment produced to the Metal Mechanic Industrialists Association of Venezuela in order to look for entrepreneurs interested in this equipment so as to undertake joint manufacturing.

2. Agrometal and Margaria SA of Argentina stated that they were interested in the joint production of implements and attachments as well as grain dryers. At the present time, both companies were holding discussions with Venezuelan entrepreneurs with a view to materializing this type of co-operation.

3. Additional contacts were made with several other Argentine entrepreneurs. The discussions concentrated on two main areas:

- a) Export of agricultural machinery and implements to Venezuela, to be followed by the establishment of joint projects in Venezuela to meet the needs of the country as well as for the establishment of future co-operation arrangements with other Caribbean countries, taking into account the geographic position of Venezuela.
- b) The rehabilitation of an existent tractor factory in Venezuela and the establishment of a joint enterprise for the production of several types of motors for pumping, irrigation, etc.

Detailed offers from the enterprises concerned would be sent to Venezuela.

Discussions between Argentina and Yugoslavia

The Argentine firms Temtlar, located in Rosario and Tanzi located in Arequito (Santa F ) expressed interest in various forms of co-operation with Yugoslav firms related to the production of agricultural machinery. At the same time, the Yugoslav representative informed the representatives of the two firms about the production capabilities of the Yugoslav agricultural machinery industry. Both sides promised to explore more fully the possibilities of future co-operation in the production of agricultural machinery. In addition, the Yugoslav delegate was informed in more detail of the activities of INTI in the field of agricultural machinery and agro-industry.

### Discussions between Algeria and Guinea

The idea of the establishment in Guinea of a joint enterprise for the reneing and servicing of agricultural machinery was discussed by both parties. The representative of Algeria accepted in principle the recruitment of two engineers from Guinea specialized in agricultural machinery to the Research Unit of the National Enterprise for the Production of Agricultural Material (PMA) at Sidi-Bel Abbès in Algeria. These two engineers would study the adaptation of the agricultural machinery produced in Algeria to the conditions of the sub-Saharan region of Africa in general and to Guinea in particular. These discussions would be followed-up in Algeria during the visit of the Guinean representative.

### Discussions between Algeria and Mali

After an exchange of information on the degree of agricultural mechanization in both countries and the different possibilities of co-operation, the following was envisaged:

a) The possibility of establishing a joint enterprise between Algeria and Mali with the objective of renting and selling (in installments) agricultural machinery;

b) The joint operation of two agricultural undertakings in Algeria and Mali under the auspices of the National Enterprise for the Production of Agricultural Material (PMA) of Algeria and the Division of Agricultural Machinery of the Ministry of Agriculture in Mali. Through this joint operation, the Algerian side would supply machines and agricultural equipment to the undertaking in Mali. Mali would inform the Algerian side of the results of the application of the Algerian equipment to the specific conditions in Mali.

### Discussions between China and Algeria

Algeria would consider importing certain amounts of walking tractors (12 to 15 HP), wheel tractors (30 HP) and seeding equipment. To this end, Algeria wished to obtain a catalogue and price list of the above machines from China. The Chinese side agreed to provide Algeria with these items.

### Discussions between China and Egypt

The two sides discussed the common projects of interest concerning the agricultural machinery industry (loaders, back hoes, ditchers, mould board ploughs, disc harrows, manure and fertilizer spreaders, etc.) as well as the production of multipurpose units and complete lines for non-traditional crops. Both sides agreed that these subjects were interesting and important and needed more detailed discussions and decided to contact each other either in China or Egypt to implement these projects.

### Discussions between China and Guinea

The two delegations exchanged views on the possibilities for co-operation in the field of agricultural machinery. The delegate from Guinea expressed interest in co-operation with China in the production of ploughs, rakes, sowing machines and animal-drawn agricultural implements. The Chinese delegation expressed the desire for further discussion on the possibility of such co-operation.

### Discussions between China and Jamaica

Specific discussions on the possibility of China supplying Jamaica with rice production machinery took place. Additional information would be sent to Jamaica by the Chinese delegates.

### Discussions between China and Mali

Mali indicated that it wanted to import from China equipment to manufacture agricultural machinery. The agricultural machinery research institutes of Mali expressed the wish to work with Chinese experts to develop the new machines which were suitable for conditions in Mali. The Chinese delegates indicated that from their side, they would be happy to co-operate with Mali in these ventures and both sides agreed to continue the contacts in the near future.

### Discussions between China and Mexico

China and Mexico discussed the possibility of co-operation in the field of the agricultural machinery industry. Mexico expressed interest in the transfer of Chinese technology in order to produce tractors up to 70 HP, and to acquire more material from China. China expressed the wish to co-operate with Mexico and provide the material requested by Mexico and adequate information would be sent to Mexico.

### Discussions between China and Pakistan

The delegate from Pakistan discussed the possibilities of having joint ventures with a transfer of technology from China for the production of the following agricultural machinery:

1. Processing equipment for wheat, cotton, rice and sugar cane.
2. Canning equipment for fruits and vegetables.
3. Cultivating, planting and harvesting machines.
4. New types of animal-drawn implements.
5. Small tractors with up to 15 HP.

The Chinese delegation expressed its willingness to provide the above-mentioned machinery. It would contact the Pakistani Ministry of Industry in the near future to further discuss the implementation of such co-operation.

### Discussions between China and Senegal

The Chinese delegation gave some information about the agricultural machinery made in China. The delegate from Senegal expressed interest in small tractors, water pumps and small engines produced in China, and stated that some co-operation already existed between the two countries in the field of agricultural machinery. The delegate from Senegal also stated that Chinese products had a good reputation in Senegal, and hoped that joint production of agricultural machinery could be established between entrepreneurs of the two countries. The Chinese delegation was desirous of such co-operation and expressed interest in helping Senegal produce Chinese designed agricultural machinery. The Chinese delegation further stated that the Chinese Agricultural Machinery Import and Export Corporation would be designated to carry out further discussions with the Senegalese counterpart for the implementation of such co-operation.

Further, a project was discussed on the feasibility of carrying out a joint venture in Senegal for the production of disc units, rowers and so on.

#### Discussions between China and Yugoslavia

Both delegations expressed satisfaction with the co-operation between the two countries in the field of agricultural machinery. However, they felt that co-operation could be more diversified and extended. In that context, both delegations exchanged documentation on agricultural machines, implements, attachments and equipment offering each other industrial and other forms of co-operation. Each side would carefully examine the interest for machines offered for co-operation and in due time, would inform the respective counterpart about specific interest including the type of co-operation sought and other follow-up measures. Both sides discussed the possibilities for joint production in the field of agricultural machinery for export to other countries.

#### Discussions between Egypt and Algeria

There was consideration of the possibility of the common production of combine harvesting machines and also of a small-sized press bailer. This project required further study. Both parties agreed to exchange visits in December 1986 and the following January. If feasible, the project could begin execution within one year.

#### Discussions between India and Guinea

Areas of interest where India could supply the necessary know-how were identified as:

1. Simple agricultural implements such as threshers, harvesters, seeding machines, etc.
2. Necessary inputs later on for more advanced implements.
3. Pump sets (diesel).

It was decided that the requirements expressed by the representative of Guinea would be forwarded to the agencies dealing with them in India and then to follow it up once these contacts were established.

#### Discussions between India and Jamaica

Jamaica conveyed its interest in exploring future possibilities for the transfer of technology to undertake production of tractors and other agricultural machinery. It was decided to pass on the requirements expressed by the Jamaican delegate to the agencies dealing with them in India and then to follow it up once these contacts were established.

#### Discussions between India and Mali

It was noted that the experience of India in the following fields was of particular interest to Mali:

1. Experimenting
2. Researching
3. Training
4. Simple agricultural implements.

The following areas were identified where India could provide the necessary know-how: Sowing, soil preparation, seed treatment, harvesting equipment and water pumps (diesel type). The necessary know-how for gradually undertaking the manufacture of such machinery in Mali was also discussed. It was decided to pass on the requirements expressed by the representative of Mali to the agencies dealing with them in India and then to follow it up once these contacts were established.

#### Discussions between India and Morocco

The representative of Morocco expressed his appreciation for the "Green Revolution" in India and wanted the assistance of India, particularly in the following areas:

1. Extension programme
2. Manufacture of simple tools
3. Pump sets (diesel).

It was decided to pass on the requirements expressed by the Moroccan representative to the agencies dealing with them in India and then to follow it up once these contacts were established.

#### Discussions between India and Yugoslavia

During the discussions, both sides noted the progress made in the on-going production co-operation in the field of agricultural machinery between the two countries, which included the manufacture and supply of certain components and spares for tractors and other agricultural machinery by India to Yugoslavia and vice versa. It was noted that there was still scope for further extending the same.

#### Discussions between Mali and Brazil

The discussions dealt with the supply of seeders, fertilizer equipment, tillers and bailers. As a follow-up, catalogues and price lists would be sent to Mali to be passed on to the entrepreneurs in Bamako.

Further discussions were held between the representative of IPT Sao Paulo and the representative of Mali regarding the preparation of a study for the introduction of Brazilian material to Mali and co-operation with the Institute of Machinery Research. The Brazilian delegation promised to send a list of their products and export material to Mali. The Brazilian side would inform EMBRAPA (a Brazilian research institute for agronomy and agricultural material) for future co-operation.

#### Discussions between the Philippines and China

China was interested in supplying a wide variety of agricultural equipment to the Philippines. The Philippines representative was particularly interested in diesel and gasoline engines up to 15 HP. The Chinese side promised to send a catalogue of their agricultural machinery equipment to the Philippines and expressed the desire for further contact on the subject.

#### Discussions between the Philippines and Jamaica

The subject of sugar and sugar factories was discussed including types and methods used in the manufacture of sugar cane, machinery and equipment used. Both countries were able to provide turnkey factories and they decided to exchange technical information in order to complement each other on joint collaboration with other countries.

#### Discussions between Senegal and Yugoslavia

The representative of Senegal supplied his Yugoslav counterpart with information about the needs of Senegalese agricultural machinery manufacturers in order to expand the production through the introduction of tractors and different types of pumps. Co-operation could be envisaged in the form of a joint venture. The representative of Yugoslavia committed himself to inform the corresponding Yugoslav institutions about these projects and also to notify the representative of Senegal about the possible interest of these institutions in the proposed co-operation.

#### Discussions between Yugoslavia and Algeria

Both sides discussed industrial co-operation between organizations of their respective countries on some types of agricultural machines and implements. Yugoslavia provided more information on the range of machines, attachments and other farm equipment that it produced. It was agreed that Yugoslav firms would soon submit to Algeria more technical, commercial and other information on a few specific machines, attachments and farm equipment that might be the subject of future industrial and other forms of co-operation.

#### Discussions between Yugoslavia and Egypt

Both sides discussed specific lines and forms of co-operation in the field of agricultural machinery. Both countries agreed to further the possibilities for future co-operation.

#### Discussions between Yugoslavia and the Philippines

Yugoslavia offered the Philippines industrial and/or other forms of co-operation in the production of a wide range of agricultural machinery, attachments and equipment. The other forms of co-operation considered ranged over technical assistance, joint ventures, coconut oil, coconut by-products and also marketing linkages with their products. It was felt that more useful co-operation between firms of the two countries might be established, in particular if supported by mutually acceptable financial arrangements. It was agreed that Yugoslav producers of small tractors would submit in the near future an offer to supply a specific type of small tractor with attachments. The Philippines expressed interest in the Yugoslav proposals for co-operation and promised to respond after further consideration.



Discussions between Yugoslavia and Venezuela

The Yugoslav representative provided a full list of agricultural machinery which could be exported to Venezuela. At the same time, the Venezuelan representative expressed great interest in specialized equipment for mountainous areas and small and medium size farms. The Yugoslav representative promised to furnish Venezuela with all the details on the above subjects as well as other elements that could be of interest for further co-operation.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### Conclusions

1. This second Round-Table Ministerial Meeting constitutes a concrete practical step forward towards the better use of resources existing in developing countries in the agricultural machinery and implements industry.
2. The fact that so many projects were discussed among the participants demonstrates the importance of this meeting as an instrument to foster South-South co-operation.
3. This event made it possible to have mutually advantageous contacts between public/public, public/private and private/private enterprises.
4. There is a need for a continuous and systematic exchange and assessment of experiences and information in the fields of R + D including the development of prototypes.
5. As it is frequently very difficult for participants to follow-up projects initiated at this type of meeting in order to achieve successful results, it was felt that a way of coping with this problem could be for the participants in this meeting to attend the next Algiers Fair (June 1987), during which a day could be set aside for further contact and monitoring of the agreements reached during the Buenos Aires meeting.

##### Recommendations

1. UNIDO should assist developing countries in their follow-up action arising from this Meeting, either through technical assistance or help in securing the financing required to start up projects agreed upon at the Meeting whenever requested, and to help find appropriate sources of finance for the implementation of the projects.
2. After receiving the answers to the questionnaire distributed to the participants, UNIDO should up-date and disseminate the information on this sector.
3. UNIDO should continue to organize Round-Table Ministerial Meetings on a sectoral basis by using the same approach as applied in Novi Sad (Yugoslavia) in 1985 and continued in Buenos Aires (Argentina).
4. The Governments of the participating countries should make provisions to remove obstacles standing in the way of the exchange of prototypes.
5. The private sector - in co-operation with UNIDO - should organize seminars in order to exchange information on standardization and quality control.

Annex

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