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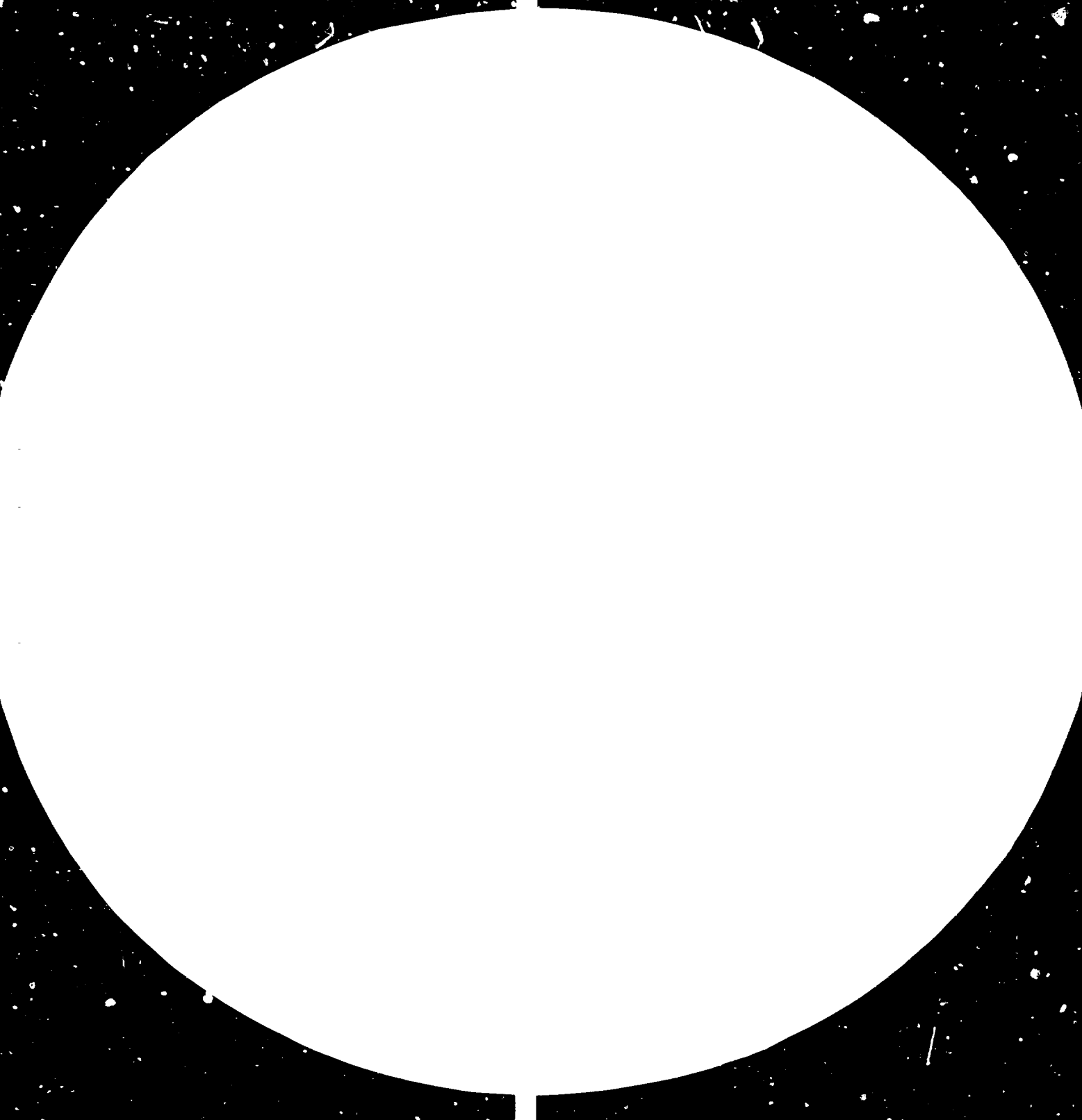
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28



32



36



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Distr.
LIMITED

ID/WG.330/27

8 October 1980

ENGLISH

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

COUNTRY SUMMARY - GUYANA*

by

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SUMMARY

Guyana, population 850,000, area 83,000 square miles (21,500,000 hectares), GDP in 1979 G\$1170 million (US\$456 million), expends a large portion of its foreign currency earned through the export of sugar, rice and bauxite on the purchase of capital equipment for agriculture. Small wheeled tractors mainly used in the rice industry number approximately 5500, together with combine harvesters, crawler tractors and other supportive heavy earthmoving equipment have an estimated total written down value of G\$11,500 million (US\$4,480 million), representing over 95 per cent of the capital investment in agriculture.

Support facilities have been generally disorganised in general but plans are afoot to remedy this situation. The Guyana Sugar Corporation (Gysuco) has been a noticeable exception with good preventive maintenance, operating and repair practices. Gysuco also runs a good training programme for young mechanics. The Works Division's Foundry of the Guyana National Engineering Corporation has given good support to the sugar industry and the Tractor and Motor Division has given good back-up support to Caterpillar equipment through its Guyana Tractor and Motor Division.

The Guyana National Engineering Corporation recognises that there has not been the type of support necessary for the improvement in technology associated with agricultural activity that will have the spin-off effects in the economy as a whole and that will assist in reducing foreign currency expenditure. It plans to increase its activity in spare parts manufacture, in the possible local assembly of tractors and to increase its activity in research and development of agricultural products.

OUTLINE

Thesis: The Guyana National Engineering Corporation, through its Tractor and Motor and Works Divisions, plans to involve itself in activities associated with agricultural production. These activities will have spin-off effects which will stimulate the development of the economy. This plan can be effectively achieved through collaboration with more developed countries and organisations associated with agricultural activity.

- I. Economic background of the country

- II. Agricultural production
 - A. Crops and methods of production
 - B. Equipment
 1. Type
 2. Availability
 - C. Existing support facilities

- III. Corporate strategy to achieve development
in the agricultural sector

THE USE AND DEVELOPMENT OF AGRICULTURAL EQUIPMENT IN GUYANA

Despite the fact that Guyana is one of the under-developed countries, which is seriously affected by a severe shortage of foreign currency reserves, it relies largely on the importation of goods and commodities for domestic consumption and for use in the generation of primary products for export. Guyana is classified by the United Nations as one of the most seriously affected countries in the Caribbean due to the low level of foreign exchange reserves and high level of imports.

Guyana lies on the northern coast of South America between 57° and 61° longitude and 2° and 8° latitude. The country is bordered to the north by the Atlantic ocean, to the east by Suriname, to the south by Brazil, part of which is also the western border with Venezuela. It has many big rivers the biggest of these being the Essequibo, the Demerara and the Berbice which flows into the Atlantic ocean and the natural boundary separating the country from Suriname is another big river the Corentyne.

The country has a considerable land mass of approximately 83,000 square miles (21,500,000 hectares) and is divided into four natural regions:-

- (1) A coastal strip of rich alluvial soil which extends along the northern atlantic coast and averages about 15 miles (24km) wide.

This area represents about 5 per cent of the total area and produces about 30 per cent of the gross domestic product (GDP). It lies below sea level and has to be protected by extensive sea and river defences. There is also the need for the provision of a system of drainage and irrigation. Sugar, rice, fruit and vegetables are produced in this region. Approximately 90 per cent of the population inhabits this area.

- (2) The hilly, sand and clay belt. This region supports forest cover and it is in this area bauxite is mined. Some timber jacking operations are carried out in parts of this area and recently there have been a number of programmes which have been started to exploit this resource more effectively. Another useful commodity which abounds throughout the region is white sand of a high silica content and is presently used in building and construction. At present a project for manufacturing glass is on stream.

- (3) The savannahs, where cattle ranching is undertaken on a large scale.

- (4) The mountainous regions which lies near to the western and southern borders. The highest point being Mount Roraima which is nearly 9000 feet (2740m) above sea-level. The second highest waterfall in the world the Kaitour falls with a total drop of 822 feet (250m) is found in the western highlands.

The population is estimated at just over 350,000 with a literacy rate of 85 per cent.

The economic system is based on a policy of co-operative socialism. The natural resources and essential services are owned by the State. The economy is divided into three sectors, the public, private and co-operative. The first is the largest but it is planned that the co-operative sector will be expanded.

Industrial activity caters for the production of goods and services for local consumption and for export. The main products which are exported and are the earners of foreign currency are sugar and its by-products, rice and bauxite.

These together with production of gold, diamonds account for over 75 per cent of the total value of industrial production. Secondary industries include the production of timber, poultry and animal feed, the production of cotton and textiles, the rearing of cattle, the processing and packaging of prawns, the growing of pineapple and other fruit and vegetable for local consumption, food processing, the manufacture of light engineering items and office supplies, garments, biscuits, cigarettes, the building of boats and the repair of equipment.

Exports for sugar, rice and bauxite for 1978 and 1979 are as follows:

Commodity	1978			1979		
	Tons (1000)	Value (G\$'000)	Value (US\$'000)	Tons (1000)	Value (G\$'000)	Value (US\$'000)
Sugar	281	234,455	91,373	264	226,324	88,205
Rice	105	95,983	37,407	85	90,614	31,417
Bauxite	-	328,255	127,930	-	272,626	106,250

The gross domestic product in 1978 and 1979 was G\$1134 million (US\$442 million) and G\$1170 million (US\$455 million) respectively. The rate of exchange between the Guyanese and U.S. dollars being G\$2.5659 = US\$1.00.

Figures obtained from the Statistical Bureau, Ministry of Economic Development.

As mentioned above, the main crops are sugar and rice. The two main export commodities are sugar and products from bauxite, hence the importance of sugar is evident and with the rising price of this product on the international market, it will be even more important to the economy this year and will retain a prominent position for sometime to come. Sugar cultivation in the country is based on the use of manual labour, however, experiments in the mechanised system of agriculture has been attempted in the past and there are pilot schemes which are being run at the present time. A scientific approach to sugar cane cultivation has been practiced and in attempt to maximise output, attention has been paid to the use of fertilisers, chemicals for pest control and other modernised farming techniques that could lead to higher production. The Guyana Sugar Corporation is the main entity involved in the cultivation of sugar cane and is State owned. However there are a few private farmers who are involved in sugar cane production but their approach has not mirrored the approach used by the main producer. Of course it should be mentioned that by-products of sugar, rum and molasses are also produced.

Rice production is highly mechanised even though it is disputable as to whether the utilisation of machines has led to any significant increases in productivity, as like the private sugar cane cultivator, the majority of the rice farmers have not paid the type of attention to associated modern methods and procedures to increase yields. However because of the two crops yielded per year and a corresponding quick return on investment this industry has been a very popular path for the prospective farmer to

follow.

The land is cultivated dry and any water is drained off so that the crop can be harvested on dry land. Any ploughing is carried out with poly disc ploughs. Disc harrowing usually breaks the land down sufficiently to obtain a satisfactory seed bed for broad casting seed. A system of underwater cultivation has been used successfully provided there is an optional depth of water as it has been found that tractors and harrows could travel through flooded fields and effectively destroy vegetation. The operation is undertaken by small 45-50 horsepower tractors with cage wheels, locally manufactured, to increase flotation. Harvesting is done by both mechanical means and by labour-intensive methods.

In Guyana the dualism which exists in the sugar between the State-owned sugar estates and the small farmer and against the approach of the former to the rice producers is marked.

The continued success of the privately owned rice farmer has been to some extent due to the fact that most of these operations utilise family labour and although the minimum wage is G\$11.00 (US\$4.25) per day, substantially less is paid to these workers.

Projects are afoot to produce palm oil and soya bean in heavily mechanised projects.

The traditional labour intensive farming methods are used for the cultivation of fruit and vegetables for local consumption. Again the methods utilised lack the scientific approach needed to maximise produce. There has been little innovation as regards implements used, even in simple aids for the transport of fruit and vegetables innovation is sadly lacking and as a result a large percentage of the produce is damaged in transportation.

The production of cotton, which was produced by many small farmers twenty-five years ago, is being tried again by the Guyana National Service at Kimbia in the north western part of the country. A system utilising both labour intensive and mechanical methods are being used. However, this project is in the early stages and many of the teething problems have to be worked out. The cotton produced is earmarked for the production of textiles at the new Sanata Textile Mills in Georgetown.

Cassava, a starch obtained from the root of the tapioca plant is by small framers, used to produce cassareep for 'pepper-pot' and food flavouring and to produce an additive for wheatened flour. Although, cassava is produced by many small farmers, there is a highly mechanised cassava mill at Port Kaitumer in the North West District.

Coconuts are grown mainly on plantations, but are also produced on a number of small farms. The nuts are used for the production of oil

and soap and it should be added that many of the young coconuts are used for the water, which is a population local beverage.

The above is by no means a conclusion or in-depth record of crop production in the country, but gives an idea of the agricultural activity in the country.

Mechanical equipment used in the production of crops mainly consists of small wheeled tractors and the popular size is the 45-50 horsepower models. Approximately 5,500 tractors and 350 combine harvesters have been imported into the country. These figures exclude those tractors which are used in road building and other earth moving and other non-agricultural activities. The total horsepower of the agricultural tractors to date is about 3,000,000 and for combine harvesters 30,000.

Crawler tractors with low ground pressures are also utilised, mainly in the sugar industry which employed about 80 International Harvester units and which are now being replaced by Caterpillar D6D SA and D4 tractors. The agricultural implements, ploughs, harrows and scrapers are being acquired from 'Rome.' Farmers also own 4 X 910 wheel loaders, 4 X 120B, 1 X 120G and 2 X 12G motor graders. Many small farmers have a few crawler tractors which are mainly Caterpillar D2, D4, D5, D6 and D7 tractors. The total horsepower of crawler tractors and heavier earthmovers total about 25,000 horsepower.

A number of small Ruston Bucyrus 10PB draglines are utilised in the sugar plantations and by some of the small farmers. Unfortunately, this model of dragline has not been produced for about twelve years now and the smaller hydraulic excavators are now being considered as an alternative. The dragline has proved to be a much more forgiving machine in terms of poor preventive maintenance than its newer hydraulic excavator counterpart, which demands much greater care and level of preventive maintenance.

The written down value of wheeled tractor machinery is approximately G\$4,500,000 (US\$1,750,000) and that of heavier earthmovers in agriculture about G\$7,000,000 (US\$2,730,000). These figures represent well over 95 per cent of the total capital invested in the agricultural sector of the economy, hence the importance of agricultural machinery to the national economy which depends mainly on sugar and rice for the earning of foreign currency. The only implements that are locally manufactured are the cage wheels which are used on wheeled tractors for flotation; virtually all other equipments which are acquired as new units and spare parts are imported. All this equipment uses dieselene or, in a few cases, petrol for powering the prime movers. This means that there is a continuing out flow of scarce foreign resources to acquire and upkeep this machinery in a situation where foreign resources are extremely scarce.

There are attempts being made by the Government to diversify its cultivation of other crops and this will call for substantial exercises in modifying machines and sub-assemblies, if the existing machinery is to be effectively utilised.

Because of the operating practices and poor practices of preventive maintenance machine availability is extremely low and may just top the 50 per cent mark. Preventive maintenance is minimal and as a result of this breakdown maintenance is the order of the day and is extremely costly, in terms of higher replacement parts and components cost, increased fuel consumption and down time cost. The absence of a scientific approach to the applicability and use of machines serves to increase the problem.

There are a number of Government Ministry repair facilities for repairing agricultural equipment. Throughout the coastal belt and in some parts of the hinterland; in the main these shops were badly organised and run, they lacked adequate tooling and support equipment to cope with the variety of repairs required of them. A part of their ineffectiveness was because of the large variety of different makes and type of equipment which they had to service. Continuing shortages in spare parts and money to purchase spare parts by users have not helped the problems that exist. Shortages of operating and repair skills are other factors which have added to the difficulties encountered in maintaining reasonable machine availabilities. Organisations like the

Guyana Rice Board maintains spares stores and repair shops, but these are little or no better than the ministerial shops. In contrast to these however the Guyana Sugar Corporation has a relatively good preventive maintenance system, has a major repair shop at Albion Estate and runs an excellent apprentice training scheme for mechanics. Also expatriate organisations contracted to undertake agricultural projects in support of agricultural programmes, either bring their own maintenance systems for their use or are able to employ the best available skills, primarily because of their ability to pay higher wages.

However there is now a plan to establish centralised repair centres for the repair of ministerial equipment, with a special shop equipped with tools, machinery equipment, and the necessary skills to carry out the necessary service. One such shop at Melanic Danishana twelve miles from Georgetown along the coast is presently being built through assistance from the German Democratic Republic.

In the Guyana National Engineering Corporation, the foundry section of the Works Division has always played a vital role in providing a repair service for equipment used by the Guyana Sugar Corporation (Gysuco.) The Foundry has facilities for casting bronze bearing and cast iron components. The Foundry has also had successes in manufacturing water pumps used by Gysuco. There are plans afoot to establish a research and development centre for the manufacture of agricultural

implements suited to present cultivation, and that planned for the future. Also planned is the establishment of a manufacturing centre for units like trailers used in the sugar industry. The Foundry has also been involved with the rebuilding of mill rolls used in the cane factories.

The Tractor and Motor Division of the Guyana National Engineering Corporation is divided into two companies, the Guyana Tractor and Equipment Company (Guytrac) and the Agricultural and Automotive Company. The former is the dealer for Caterpillar, Bucyrus, Rome and Fleco equipment among others. Guytrac has a well developed dealership for giving back-up support to Caterpillar products and attachments used with Caterpillar machinery. The Parts Department at Guytrac has a large holding of spare parts for Caterpillar equipment even with the present crisis in scarce foreign currency reserves. One of the reasons for this apparent paradox is due to the fact that a decision was taken to increase our level of spare parts holding at the expense of the acquisition of new machines; the philosophy behind this being that there is no point in selling new machines without the necessary support. As a result of this the Guytrac Parts Department has been able to maintain a service percentage of 82 per cent on fast moving parts ordered from the facility. The Parts Department also has the capability of fabricating high pressure hose from the hose stocks on hand and the fittings that go with them. Guytrac also has a repair facility which is equipped with tooling and equipment needed for the repair of Caterpillar equipment.

The practice of parts reuseability as a first resort has resulted in significant savings in spare parts purchases. The rebuild of undercarriage components is another area which has resulted in significant savings of foreign currency spending as well as savings in absolute terms to the user, for undercarriage costs can attain substantial values during the life of a machine. Associated with undercarriage rebuild, Gytrac's custom track inspection service helps to minimise costs on machines in operation. A new Technical Analysis programme has recently been implemented, in which scheduled machine evaluation will be undertaken for customers. In addition to these existing programmes plans are afoot to extend the parts assembly exchange programme to Guysuco and to establish a scheduled oil analysis programme for equipment, whereby samples of oil taken from machines will be analysed for worn elements through the use of an atomic spectrophotometer.

Gytrac combats the problem of the shortage of available skills by running an on-going Trainee programme, whereby graduates from high school and technical schools are recruited and put through a two-year job-oriented training programme so that they can acquire basic fitting skills and are able to trouble-shoot mal-functioning equipment. The training programme is extended for graduate engineers who are required to go through the workshop and the other engineering sections of the organisation before being given the responsibility of running individual sections.

The Training Section is equipped with modern training units e.g. slide presentations showing maintenance procedures in practices, video tapes and cine-film.

It is intended for of these graduate engineers to eventually become an adviser on earthmoving equipment; he will be required to advise customers on the right mix of equipment for the job, the type of implements that will be most effective, the machine and attachments that will be most suitable and he will be involved in attachment and implement design. Another of our young engineers will be involved with tyre applications, maintenance and care.

The Agricultural and Automotive Company is, at the present time, mainly organised to support automotive vehicles; however, the emphasis is being shifted to support agricultural equipment. It is intended to upgrade the repair section of this company to handle agricultural equipment repair of diverse manufacture found in the country. Training programmes are being arranged for the workshop's personnel and training similar to those now at Gytrac are being implemented. The tooling and equipment necessary to support this activity is being drafted as a prerequisite to its acquisition.

It is hoped to move into the area of design of spare parts for production by the Foundry section of the Works Division. As an extension to this, careful thought into the manufacture of implements utilising local resources, whenever possible, will be explored.

For example it may be possible to produce scrapers, which are presently used in conjunction with crawler tractors, mainly out of wood with metallic cutting edges, etc. It is planned that a facility for testing existing and developing new machines will be incorporated within this facility.

Under consideration is the possibility of establishing a tractor plant for assembling wheeled tractors received in a knocked-down condition.

Research into the use of alternative sources of energy in essential, bio-gas, wind and solar power which are effectively utilised the world over, would perhaps provide for a marked reduction in our importation of fuel oil.

It is felt that when these plans are implemented a number of benefits will result to the economy: reduced expenditure of foreign currency, the production of elementary agricultural machines and equipment will enable farmers to approach the business of cultivation in a more scientific manner, and the increase in technology will have spin-off effects that will help the economy to develop.

In order that some of these plans will be realised then there will be the need to collaborate with organisations in countries like India, Japan and China where developments of this nature have already been implemented to positive effect. There will be the need for senior managers within our organisation to be attached to entities where these

developments have been made, study tours for engineering staff arranged through organisations like U.N.I.D.O., will be most helpful, in-plant attachments for middle management to training institutions will result in increased effectiveness in coping with our problems.

It is recognised that a meeting such as this one organised by U.N.I.D.O. is an excellent start in the type of collaboration that is necessary for us to make in-roads into our present situation. There will be the need for an on-going exchange of ideas and developments which can be analysed and modified to suit our conditions.



