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Global Preparatory Meeting for Consultations  
on the Agricultural Machinery Industry

Vienna, 5-8 June 1979

REPORT

id. 79-5194

PREFACE

The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held at Lima, Peru, in March 1975, recommended that UNIDO should include among its activities a system of continuing consultations between developed and developing countries with the object of raising the developing countries' share in world industrial output through increased international co-operation.<sup>1/</sup>

The General Assembly, at its seventh special session in September 1975, by resolution 3362 (S-VII), decided that the system of consultations called for by the Lima Declaration and Plan of Action should be established<sup>2/</sup> and that UNIDO, at the request of the countries concerned, should provide a forum for the negotiation of agreements in the field of industry between developed and developing countries and among developing countries themselves.

The Industrial Development Board, the principal policy-making organ of UNIDO, at its tenth and eleventh sessions in 1976 and 1977 decided that consultations should be convened among member countries, the participants from interested countries to include officials of Governments as well as representatives of industry, labour, consumer groups etc.<sup>3/</sup>, <sup>4/</sup>

The Lima Declaration stressed, among other things, the development of efficient agro-related industries in order to achieve a high degree of integration between the expansion of agriculture and industry in the developing countries. Accordingly, at its Twelfth session in May 1978, the Industrial Development Board authorized UNIDO to proceed with preparations to convene the First Consultation Meeting on the Agricultural Machinery Industry. It will be held, at the invitation of the Government of Italy, at Stresa, Italy, from 15 to 19 October 1979. The agricultural sector is the sixth industrial sector to be covered by consultation meetings the others being iron and steel, fertilizers, leather and leather products, vegetable oils and fats, and petrochemicals.

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<sup>1/</sup> "Report of the Second General Conference of the United Nations Industrial Development Organization" (ID/CONF.3/31), chapter IV, "The Lima Declaration and Plan of Action on Industrial Development and Co-operation", para. 66.

<sup>2/</sup> Official Records of the General Assembly, Seventh Special Session, Supplement No. 1, para. 3.

<sup>3/</sup> Official Records of the General Assembly, Thirty-first session, Supplement No. 16, para. 60.

<sup>4/</sup> Official Records of the General Assembly, Thirty-second session, Supplement No. 16, para. 162.

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## INTRODUCTION

1. The Global Preparatory Meeting for Consultations on the Agricultural Machinery Industry was held at UNIDO Headquarters, Vienna, 5-8 June 1979. The Meeting was attended by 35 representatives (annex I) participating in their individual capacities, from developing and developed countries, ESCAP, FAO, ILO, and the International Rice Research Institute (IRRI).
  
2. The purpose of the Meeting was to advise UNIDO on:
  - (a) The appropriateness of the three issues selected for the First Consultation Meeting:
    - (i) Formulation of strategies for the agricultural machinery industry;
    - (ii) Basic factors and facilities<sup>1/</sup> in developing countries for the production of simple implements and machinery;
    - (iii) Practical issues relating to international arrangements concerning imports, local assembly and manufacture of agricultural machinery;
  
  - (b) Whether, on the basis of the three issues identified, specific areas of action at the national, regional, interregional and international levels can be identified in order to promote the expansion of the agricultural sector in the developing countries and an attempt made to overcome the constraints on the developing countries to the benefit of both developed and developing countries.

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<sup>1/</sup> Basic facilities consist of production premises for engineering, metalworking, metallurgical processing, with special reference to foundry, forging, heat-treatment and quality control. They should include tool-rooms which could be used not only for agricultural machinery but also for other medium-scale engineering industrial activities.

CONCLUSIONS AND RECOMMENDATIONS

3. The Meeting endorsed the following issues for consideration by the First Consultation Meeting.

(a) A paper taking into account all aspects of the formulation of a strategy for the development of the agricultural machinery industry should be submitted to the First Consultation Meeting.

(b) The First Consultation Meeting should consider the requirement for provision of basic facilities in the developing countries under the following headings:

- (i) Basic facilities for simple and intermediate equipment with emphasis on rural industrialization;
- (ii) Ways and means of production of same with emphasis on co-operation between developing countries and specific assistance from industrialized countries;
- (iii) Manufacturing facilities for more complex and specialized agricultural machinery that will provide the infrastructure for a wide-range of engineering products. These facilities include foundry and forge and provide for heat treatment, quality control etc.

(c) For the First Consultation Meeting, UNIDO should prepare some proposals, including basic principles, which could be a basis for increased co-operation in the production of agricultural machinery taking into account the interests of all the parties concerned.

(d) In view of the magnitude and urgency of the training problems, the feasibility of setting up a programme of action involving the participation of manufacturers, distributors, Governments, non-governmental organizations and institutions should be explored with the objective of obtaining the fullest utilization of existing training facilities in both developing and developed countries.

## I. ORGANIZATION OF THE MEETING

### Opening of the Meeting

4. The Meeting was opened by the Chairman of the UNIDO Task Force on the Agricultural Machinery Industry, who, in his opening speech, stressed the continuing importance of agriculture throughout the third world and noted the activities of UNIDO in promoting agriculture by industry linkages and industrial inputs to agriculture.

5. The Head of the Negotiations Section of UNIDO also addressed the Meeting. He referred to the extensive work of consultants in providing information on agricultural machinery in a wide range of countries. That information enabled the condensation of the large number of relevant issues into the three main areas of strategy, basic facilities, and international arrangements.

### Election of the Chairman and Vice-Chairman

6. The Meeting unanimously elected Chandra Mohan as Chairman and M.L. Esmay as Vice-Chairman.

### Adoption of the agenda

7. The Preparatory Meeting adopted the following agenda:

1. Opening statement by the Chairman of the UNIDO Task Force on the Agricultural Machinery Industry.
2. Statement by the Head of the Negotiations Section, UNIDO.
3. Election of Chairman and Vice-Chairman.
4. Formal adoption of the agenda.
5. General discussion including reports from regions and countries.
6. Consideration of the proposed issues for submission to the First Consultation Meeting:
  - (a) Formulation of strategies for the agricultural machinery industry;
  - (b) Basic factors and facilities in developing countries for the production of simple implements and machinery;
  - (c) Practical issues relating to international arrangements concerning imports, local assembly and manufacture of agricultural machinery.
7. Other matters.
8. Consideration of the draft report of the Global Preparatory Meeting.

Documentation

8. A list of documents is given in annex II.

Adoption of the report

9. The draft report of the Meeting was adopted in the afternoon session on Friday, 8 June 1979.



## II. SUMMARY OF DISCUSSION

### Regional and country reports

10. One regional and two country reports were presented to the Preparatory Meeting. The representative of ESCAP reported on its Regional Preparatory Meeting on Agricultural Machinery;<sup>2/</sup> detailed accounts were given of the Argentine tractor industry and the Chinese agricultural mechanization policy.
11. The representative from Argentina dwelt at some length on the export performance of the Argentine tractor industry. He explained the process of selection of particular types of tractors for local manufacture and the protection afforded by the Government of Argentina to the newly-established industry.
12. The discussion that followed the presentation of the report by the Chinese representative covered such aspects as small-scale machinery production units, the variety of machinery developed and produced, utilization of displaced labour and research and development of intermediate technology.

### Consideration of the proposed issues for submission to the First Consultation Meeting

13. The first Discussion Document (ID/WG.297/1) prepared by the UNIDO secretariat contained a number of issues for the consideration of the Meeting. Subsequent investigations and regional discussions enabled their condensation into three issues:
  - (a) Formulation of strategies for the agricultural machinery industry;
  - (b) Basic factors and facilities in developing countries for the production of simple implements and machinery;
  - (c) Practical issues relating to international arrangements concerning imports, local assembly and manufacture of agricultural machinery.

The Meeting endorsed the above issues for the consideration of the First Consultation Meeting.

### Formulation of strategies for the agricultural machinery industry

14. It was stressed that the strategy for agricultural mechanisation was crucial to the socio-economic development of the third world countries. The

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<sup>2/</sup> Report of the Regional Preparatory Meeting on Agricultural Machinery held by ESCAP at Manila, Philippines, 24-18 May 1979.

selection and manufacture of appropriate tools, equipment and machinery was of special significance in that context. The subject was vast, involving several sectors and disciplines. The participants agreed that to achieve rapid and substantial increases in agricultural and industrial production, which would act as catalysts of socio-economic development of the developing countries, it was essential for each country to formulate a strategy for developing its agricultural machinery industry. As some 80 per cent of farm holdings were still small, it was recognized that the primary and intermediate levels of mechanization might be more appropriate for them. The Meeting felt that it was not feasible to formulate a general strategy that could be applied to all countries or even to groups of countries. Each country's strategy had therefore to be tailor-made by itself to relate to its current and future needs for increased food production and to its aspirations for improved living standards. Attention should be paid to adaptation of technology, development of indigenous and appropriate technology, the impact of such development on employment, available capital resources and training requirements. Attention was drawn to the low cost of intermediate-level technologies developed in some developing countries that would be suitable for small farms.

15. Having recognized the necessity of a strategy that was exclusively a national function, the Meeting discussed at length its essential components. It agreed that the following elements could be included in country strategies:

(a) An assessment of the existing farm situation, farming systems and farm mechanization levels, with emphasis on the socio-psychological and technological settings in which the farmer worked and lived;

(b) An evaluation of the interaction of social and economic objectives with (a) above, with a view to assessing the needs of the farmers in terms of tools, implements and machines including necessary adaptations in the light of technological trends;

(c) A systematic search for practical ways and means of converting the needs of the farmers into demand;

(d) Preparation of a manufacturing programme taking into consideration the establishment of basic facilities incorporating an appropriate level of dispersal and horizontal integration policies;

(e) An assessment of the projected needs of servicing repair and maintenance facilities, adequate provision for spare parts, and preparation of a practical programme in those areas;

(f) Identification of research, design and development needs and preparation of a practical programme in those areas; the development and manufacture of appropriate low-cost equipment to meet the needs of small and medium farmers should be emphasized;

(g) An assessment of resource constraints, and formulation of a practical programme to overcome them, based on provision of finances to the farmer, credit on easy terms to manufacturers and distributors, training of users of machinery and technical workers, marketing facilities and linkages with other sectors;

(h) Institutionalized review and evaluation of the strategy on a continuous basis.

### Training

16. The participants considered lack of training one of the most serious constraints in the development of the agricultural machinery industry in the developing countries. The inadequacy and uneven quality of the current training in a number of developing countries were stressed. In the preparation of a training programme, emphasis should be placed on the training of instructors, tractor users and operators, and improvement of design development skills. The importance of establishing a special management training programme for small manufacturing firms was also stressed. The preparation of audio-visual training programme kits appropriate to developing countries for upgrading the skills of farmers and mechanics in the repair, servicing and maintenance of agricultural machinery would be practical. Training facilities should be provided as part of the capital investment in agricultural machinery.

### Implementation of strategy

17. For the formulation of appropriate policies and strategies in the field and later for their co-ordinated and effective implementation, it would be necessary to establish in each country a centralized body endowed with adequate authority and resources that should be representative of the concerned elements within and outside the Government. Such a body might be supported by a group of technical experts as its secretariat. That secretariat might be supplemented by farm mechanization committees at provincial and other local levels whose main functions might, inter alia, be to co-ordinate the activities of the different departments and ministries at operational and planning levels. Establishment, in appropriate cases, of design and development centres would be extremely useful.

18. It was agreed that a paper taking into account all the above agreed aspects would be submitted to the First Consultation Meeting.

Basic factors and facilities in developing countries for the production of simple implements and machinery

19. A UNIDO consultant showed what combination of basic facilities could provide the means of realizing the planned output of machinery in a wide variety of situations in developing countries. The actual facilities would depend on the country's requirements but the maximum use of the facilities should be made by producing components for related products. It was suggested that for the purpose of listing the facilities as given in annex IV, the UNIDO classification of four machinery types (annex III) given in document ID/WG.297/1 could be replaced by three categories.
20. A wide variety of viewpoints was expressed by the participants concerning the prospects for extending the production of medium-power conventional tractors and associated implements and equipment in the developing countries. The Chairman highlighted the difficulties for developing countries in following the production technologies used by developed countries because of their reliance on capital-intensive equipment. Developing countries should consider alternative and simple production technologies.
21. The Meeting sought ways and means by which the large established manufacturers could use their long experience of marketing products in developing countries to assist with current production problems in developing countries. It was stated that some large manufacturers were doing a great deal to ease the problem of spare parts availability. It was generally agreed that their assistance with problems in the areas of category I and II equipment (annex III) was likely to be limited and that small and medium-sized industries and public assistance institutions in developed countries were more likely to be of assistance in that respect.

Practical issues relating to international arrangements concerning imports, local assembly and manufacture of agricultural machinery

22. It was suggested that UNIDO prepare:
- (a) A model contract to deal with import policies, and licensing for local manufactures and joint ventures;
  - (b) An analysis of the experience of some developing countries (Algeria, Argentina, India) in manufacturing tractors under licence, and, based on this analysis, develop a model tractor manufacturing programme to serve as a guide to other developing countries (covering governmental initiatives and incentives, horizontal integration etc.);

(c) Case studies of effective commercialization in the developing countries of locally developed technologies with emphasis on low-cost small tractors, power tillers, engines, pumps etc.

23. It was considered that the First Consultation Meeting would provide an excellent opportunity to work out regional co-operation in terms of complementarities and specialization to achieve economies of scale.

Annex I

LIST OF PARTICIPANTS

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Food and Agriculture Organisation of the United Nations

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Annex II

LIST OF DOCUMENTS

Background documents

- UNIDO/ICIS/69 Preliminary World-Wide Study on the Agricultural Machinery and Implements Industry
- UNIDO/EX.28 Report of the First Preparatory Panel Meeting for Consultations on the Agricultural Machinery Industry
- UNIDO/EX.43 Report of the Second Preparatory Expert Panel Meeting for Consultations on the Agricultural Machinery Industry
- ID/WG.282/4 Report of Working Group No. 7 - Appropriate Technology for the Production of Agricultural Machinery and Implements (International Forum on Appropriate Industrial Technology)
- ID/WG.282/124 Draft Report of the Technical/Official Level Meeting to the Ministerial Level Meeting (International Forum on Appropriate Industrial Technology)
- Aide-Memoire for the Global Preparatory Meeting for Consultations on the Agricultural Machinery Industry

Discussion documents

- ID/WG.297/1 Discussion document
- Conclusions of the regional consultants on the discussion paper to be presented to the Global Preparatory Meeting
- Supplementary Note No. 1
- Supplementary Note No. 2 - Major concerns in the formulation of strategies for the development of the agricultural machinery industry
- Supplementary Note No. 3 - The establishment of basic facilities for the agricultural machinery industry  
UNIDO consultant
- Supplementary Note No. 4 - Practical issues relating to international agreements concerning imports, local assembly and manufacture of agricultural machinery
- Agenda of the Meeting
- The policy for agricultural mechanization in China and its possible applications to other countries and regions  
UNIDO consultant from China
- Report of the Regional Preparatory Meeting on Agricultural Machinery, ESCAP, 24-28 May 1979, Manila, Philippines
- The Argentinian tractor industry/AFAT (Asociación de Fabricas Argentinas de Tractores)

Information documents

Agricultural mechanization in relation to production, employment and income  
distribution in developing countries Rome, 18-27 April 1979  
(FAO/COAG/79/3, December 1978)

Vocational training in agricultural machinery  
Vocational training development (Rural)  
ILO, Geneva, 1979

Annex III

UNIDO CLASSIFICATION OF AGRICULTURAL MACHINERY

Category I

Implements that are simple to manufacture and operate: hand tools animal-drawn machines, and simple processing equipment. The manufacture of such equipment is readily undertaken in small to medium production units, using mainly simple forging, welding and drilling facilities.

Category II

Intermediate machinery: better ploughs and harrows to give quicker cultivation, weeders and sprayers to control weeds and disease, pumps and appropriate irrigation equipment, and trailers for transport - all required for the intensification of cropping. The manufacture of such machines is dominated by medium-sized workshops with machining, forging and welding facilities, and with access to a supply of suitable castings, bearings and steels.

Category III

Powered machinery: tractors, power tillers, threshers and dryers as well as the more complex pumping equipment necessary to meet the time requirements of cultivation, planting and harvesting especially where multiple cropping is practised. Manufacture of such equipment, which is dominated by large centralized factories, requires an adequate infrastructure in the metallurgical and capital goods industry such as foundry, forging, heat-treatment, precision machining and quality control facilities.

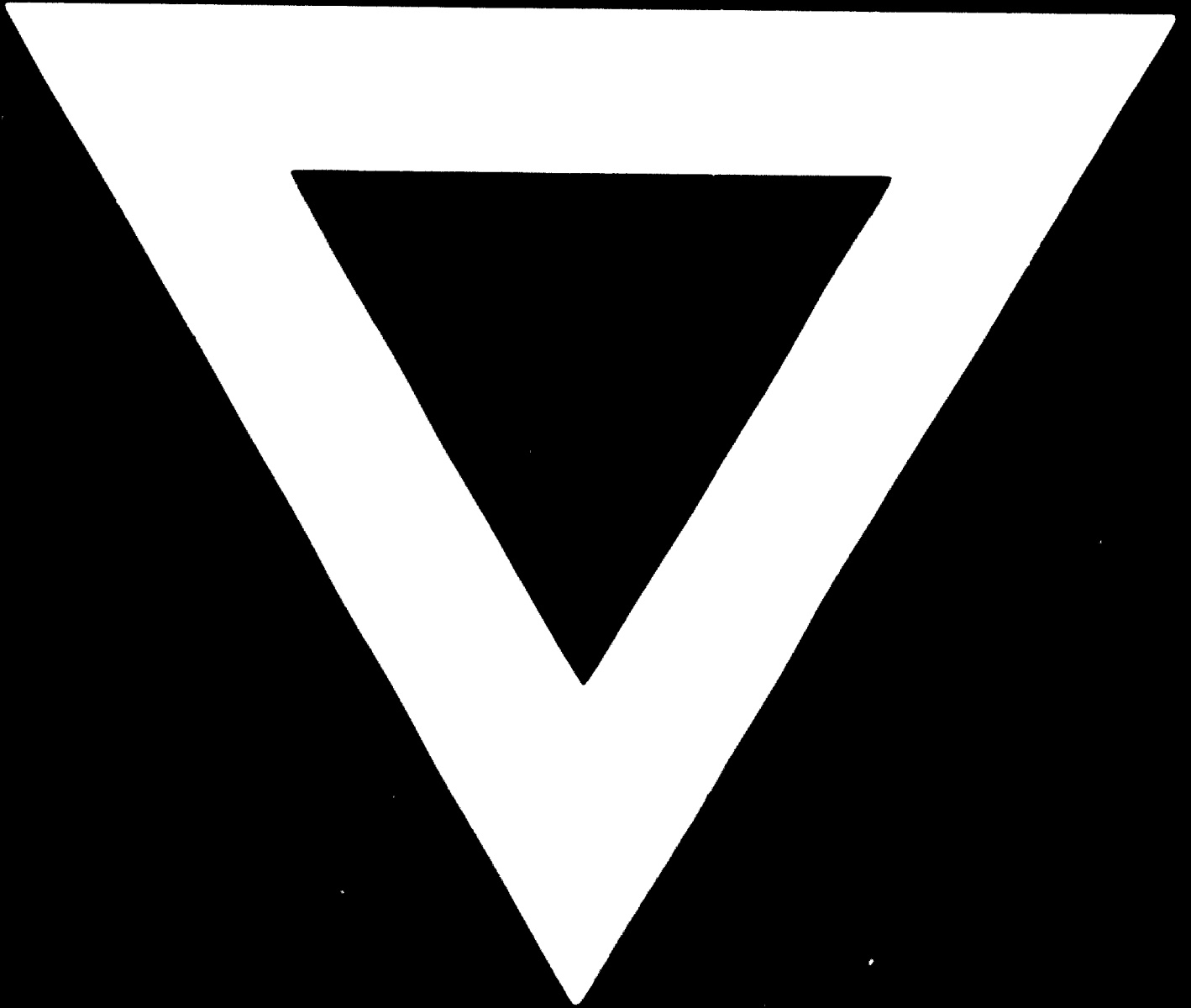
Category IV

Specialised machinery: self-propelled harvesting machinery and crop-processing equipment with a high potential for saving labour. Production of such machines needs a skilled metallurgical industry, high capital production facilities and a good capability in research and development.

Annex IV  
SUGGESTED CLASSIFICATION OF AGRICULTURAL MACHINERY  
PRODUCTION FACILITIES

AGRICULTURAL MACHINERY	MATERIALS REQUIRED	BASIC FACILITIES NEEDED	ANALOGUE MACHINERY	
CATEGORY	Main types			
I	Hand tools			
	Animal-drawn tools			
	Simple processing			
	Simple storage			
II	Tractor-mounted implements			
	Pumps			
	Trailers			
	Thrashers			
	Chellers			
	Driers			
	Processing			
	Simple power tillage			
	Small low cost tractors			
	Sprayers			
III	Medium to high speed diesel engines			
	Conventional power tillers			
	Conventional tractors			
	Self-propelled reaper			
	binders			
	combine			
	harvesters			
	WOOD	*		
	WILD STEEL	*		
	MEDIUM CARBON STEEL	*		
	HIGH CARBON AND ALLOY STEELS	*		
	CAST IRON	*		
	BRASS/BRONZE	*		
	COPPER	*		
ALUMINIUM	*			
RUBBER	*			
PLASTICS	*			
FABRICATION	*			
WELDING	*			
SIMPLE MACHINING	*			
COMPLEX MACHINING	*			
GEAR MILLING	*			
GEAR HOBBING	*			
CAST IRON	*			
FOUNDRY	*			
STEEL CASTING	*			
FOUNDRY	*			
NON-FERROUS	*			
FOUNDRY	*			
DIE CASTING	*			
SHEET METAL FORMING	*			
SHEET METAL	*			
STAMPING	*			
BLACK SMITHY	*			
POWER TONGING	*			
DIE FORGING	*			
HEAT TREATMENT	*			
WOOD WORKING	*			
PLASTIC AND RUBBER MOLDING	*			
STEEL ROLLING	*			
TRANSPORT	*			
POWER GENERATOR	*			
BUILDING	*			
MARINE ENGINE	*			
AGRO-ENGINEERING	*			
MACHINERY TOOLS	*			

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