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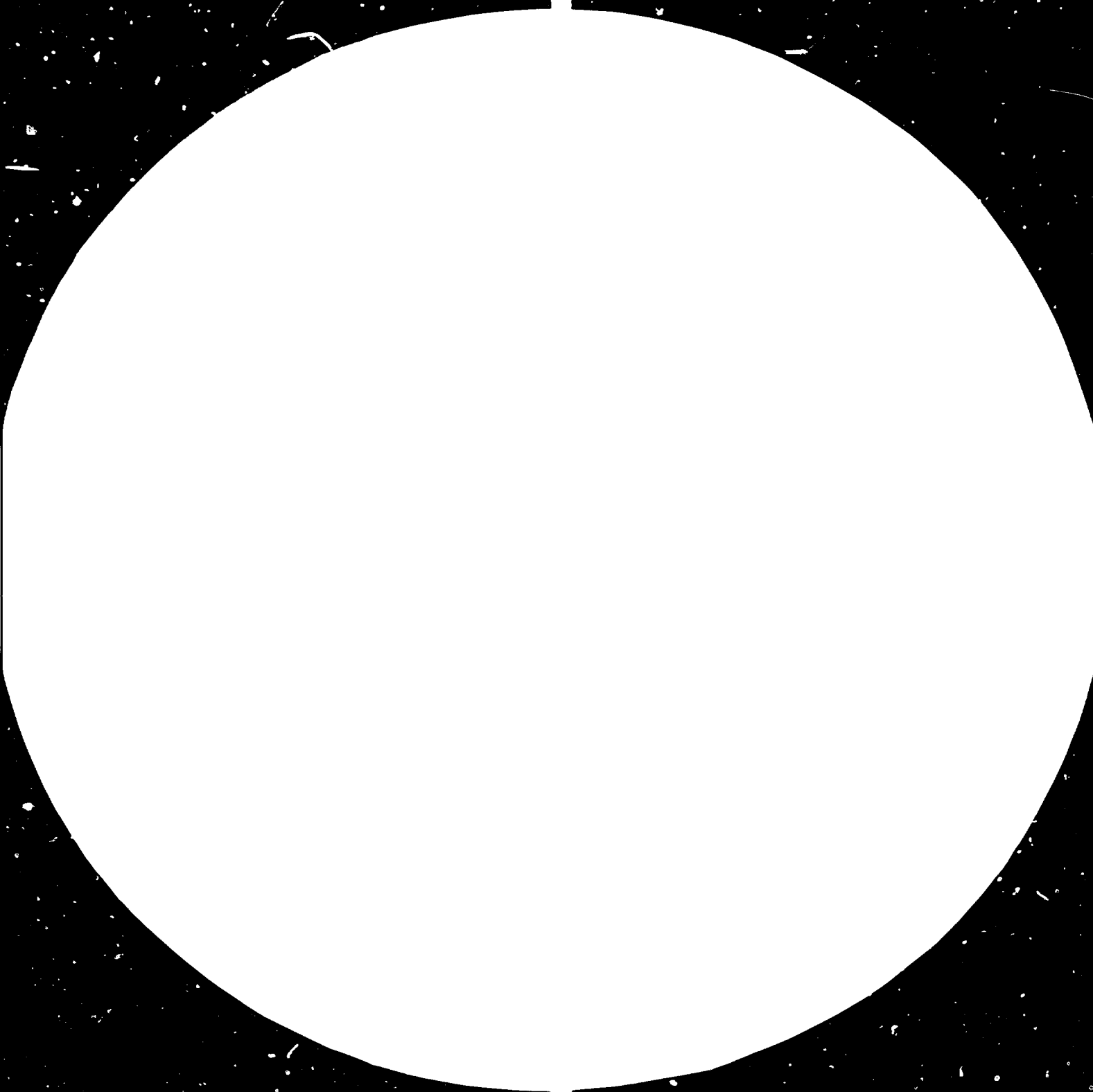
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TENTATIVE PROPOSAL FOR THE FORMULATION OF AN  
AFRICAN DEVELOPMENT PLAN FOR AGRICULTURAL MACHINERY AND EQUIPMENT \*  
(1982-1990)

prepared by  
the Secretariat of UNIDO

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I. OBJECTIVES, CONSTRAINTS AND OPPORTUNITIES OF AN AFRICAN  
DEVELOPMENT PLAN FOR AGRICULTURAL MACHINERY AND EQUIPMENT

In presenting this document to the First Regional Consultation on the Agricultural Machinery Industry, the UNIDO Secretariat has started from the hypothesis that an initial consensus would be achieved during the Consultation regarding the following objectives:

1. The development of production capacity for machinery and equipment for use in agriculture, food production and rural activities in general constitutes a priority objective of the African countries. This is clearly shown by the Lagos Plan of Action. <sup>1/</sup>
2. It is the aim of the African countries to promote another type of development that reconciles agriculture and industry, giving priority among the essential needs of the population to food production and reducing dependence on the developed countries for equipment, with the aim that the African States and peoples should, for their own benefit, regain control over a type of technology and mechanization suited to African conditions.
3. The African States intend to adopt a plan of action of national, subregional and regional scope. Without a national base, a regional plan has no reality and would constitute an empty infrastructure; conversely, the development of intra-African co-operation is necessary for the success of national plans.

The UNIDO Secretariat has also taken account of the following constraints:

1. The time is not yet ripe for preparing a long-term action programme immediately. Surveys carried out in 16 African States have revealed much uncertainty regarding the precise situation and the nature of projects, and this uncertainty must be dispelled. Moreover, it is also necessary to ascertain the situation in the other African countries. In most cases, no agricultural mechanization policy has been determined.
2. Generally, the countries do not have the institutional machinery necessary for the formulation of national programmes of action regarding agricultural machinery that would integrate agriculture and industry. The establishment of such machinery, even in embryonic form, is therefore the first measure proposed.

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<sup>1/</sup> Lagos Plan of Action for the Economic Development of Africa,  
OAU - ECM/ECO/9 (XIV) Rev.2.

3. The level of intra-African co-operation is very low at the moment. <sup>2/</sup> Trade is confined to hand tools and animal-drawn cultivating equipment. Such trade is sometimes even on the decline. Information concerning appropriate technology and equipment, or the solutions worked out by the various research and development centres does not circulate between African countries. Industrial co-operation is at a standstill regarding the basic infrastructure, forges, foundries, for example, the subcontracting of parts and components and spares. This is a fact that must be taken into account.

4. The weakness or non-existence of a capital goods industry - the agricultural machinery industry is part of that sector and uses the same basic elements of the infrastructure - has led Africa as a whole to depend on imports and industrial co-operation with the developed countries. At the moment, such imports account for 90 per cent of the regional market for agricultural equipment. As a result of this constraint, two-fold action is necessary:

- . Better negotiations on imports by the African countries and the promotion of new forms of co-operation; <sup>3/</sup>
- . The adjustment of bilateral and multilateral co-operation in the light of a re-evaluation of demand for machinery for agricultural and rural use, to be manufactured in African countries or groups of countries, and possibly a search for new partners.

The UNIDO Secretariat has also taken into account the dynamism of existing trends that positively influence the development of the agricultural machinery industry.

1. The Industrial Development Decade for Africa is the mandatory framework for thought and action regarding any sectoral programme. It is not only a necessary framework, it is also an opportunity. In fact, an agricultural machinery programme should be integrated in the dynamics of the Lagos Plan of Action. The UNIDO Secretariat's

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<sup>2/</sup> See the diagnostic study made on the basis of 16 case studies (UNIDO/IS.288) and the internal working paper prepared by Mr. Mitra of the Joint UNIDO/ECA Division, Addis Ababa.

<sup>3/</sup> It will be recalled that following the First Consultation Meeting on the Agricultural Machinery Industry (Stresa, Italy, 15 - 19 October 1979) the UNIDO Secretariat was requested to explore ways and means of strengthening co-operation. Draft model contracts have been prepared for discussion during the second consultation meeting to be held at world level.

proposals are related to the general implementation of the programme of action for the Decade, recently considered by the Sixth Conference of African Ministers of Industry <sup>4/</sup> - extracts from which are given in annex 3.

2. All African countries have their specific characteristics, but also they all have similar problems. There are agro-ecological zones in which the problems of agricultural mechanization transcend national frontiers. These objective factors are favourable to African co-operation.

3. Types of technology and equipment that are more suitable for African conditions have been developed, within African countries, and sometimes on the basis of models from other developing countries. For instance, Zambia and Zimbabwe manufacture animal-drawn ploughs and other implements according to a model from India. The same applies to a type of motorized thresher designed in Egypt on the basis of an IRRI model. Therefore it is not necessary to invent everything afresh, but information on many such achievements, which are unknown in most African countries, must be disseminated.

4. The developed countries and certain advanced developing countries are considerably involved in co-operation with African countries, <sup>5/</sup> for instance, the Federal Republic of Germany with Algeria, the United Kingdom with Uganda, France with Senegal and Mali, Poland with Ethiopia, China with Tanzania and India with Kenya, Nigeria and Zambia.

The partners in such co-operation are therefore already on the spot and are informed regarding the realities of the situation in Africa.

The following proposals have been prepared on the basis of the objectives, constraints and potential considered above.

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<sup>4/</sup> Document ECA/CMI.6/8, 2 December 1981.

<sup>5/</sup> The China/UNDP/UNIDO project for the establishment in Beijing of an International Centre for the Promotion of the Agricultural Machinery Industry in Developing Countries bears witness to the interest shown by the international community in international co-operation in this sector.



## II. CONTENT OF THE PROPOSED PLAN

It is suggested that the First Regional Consultation on the Agricultural Machinery Industry should discuss the principle and broad outlines of an African Development Plan for Agricultural Machinery and Equipment (in French: Plan Africain de Développement des Equipements et Matériels Agricoles - PADEMA) designed to achieve the priority aims and to eliminate or attenuate negative constraints. A major dynamic project, based on existing national, subregional and regional institutions, <sup>6/</sup> should provide a framework for thought and action with regard to co-operation between African countries and between those countries and the international community.

PADEMA would be designed and organized for the period 1982-1990, covering the rest of the Industrial Development Decade for Africa.

It would consist of two programmes:

- A. The short-term programme (1982 - 1984);
- B. The medium-term programme (1985 - 1990).

A. The results of the short-term programme would be:

- 1. The initial formulation of national development programmes for agricultural machinery:

National programmes constitute the basis for subregional and regional programmes.

The formulation of these programmes necessitates the establishment in each country, if no such body exists, of a National Committee for Agricultural Machinery and Equipment, which would co-ordinate the activities of the main organizations concerned in this field, especially Ministries of Agriculture, Industry and Planning. This Committee should superintend the implementation of the national programme and constitute the focal point for the PADEMA Plan.

During this period, the necessary urgent economic and financial measures would be taken, according to the specific nature and within the sovereignty of each country, in order to provide the conditions necessary for the implementation of a development programme for agricultural machinery. These measures are related

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<sup>6/</sup> Including ARCEDEM (African Regional Centre for Engineering Design and Industrial Manufacturing), Ibadan, Nigeria; ARCHTR (African Regional Centre for High Training and Research), Nairobi, Kenya; ARCT (African Regional Centre for Technology), Dakar, Senegal.

in particular to agricultural policy, adequate prices for agricultural products, credit for farmers, and support for handicraft and industrial enterprises manufacturing agricultural machines and tools.

2. The establishment of the operational machinery necessary for the formulation of national, subregional and regional programmes.

This operational machinery comprises:

(a) Information units - permanent bodies - responsible to the National Committees for Agricultural Machinery and Equipment - that would be the basis, first, for a national and later for a regional information system.

The information necessary for the formulation of national, subregional and regional plans includes: evaluation of the existing industrial production apparatus, its potential for the assimilation of technology, technology suitable for Africa, <sup>7/</sup> investment projects related to agricultural machinery, the prospects of the sector, the development of African markets, equipment needs of the various sectors of demand, in particular the peasant farming sector, which dominates in Africa, systems of agricultural mechanization and technical assistance projects. Such information would be disseminated through various communication channels.

(b) Practical guides for devising and implementing integrated national strategies for mechanization, integrating agriculture and industry. Such guides would be prepared after the methodology had been tested in a number of countries. They should help African decision-makers to use the operational information collected by the information units.

(c) Research and experimentation <sup>8/</sup> on:

. Appropriate forms of mechanization and the characteristics of the various types of equipment required: basic staple

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<sup>7/</sup> Suitable technologies for Africa are those using local resources, for example, the production of simple wooden implements, the use of solar energy in zones with high exposure to sunlight, or that make the maximum use of human resources: for example, the assimilation of the technical process of producing articles welded together out of semi-finished products by village blacksmiths.

<sup>8/</sup> Concerning the content of this paragraph, please refer to Issue Paper No. 1, and, in this document, to annex 1, programme CAP 4.

food production equipment for peasant farmers, small rural transport equipment, storage and processing equipment for agricultural products, cultivation equipment required for new techniques aimed at reducing the extent of cultivation operations (minimum tillage), or even eliminating preparation of the soil, the choice of mechanization in the light of energy choices in the rural environment, etc.

- . The design and adaptation of equipment in order to make it possible to manufacture it locally (completely or partially) and to reduce maintenance problems and attendant direct or indirect costs: for example, the use of one and the same power unit for a varied range of equipment, the standardization of equipment assemblies and components, etc.
  
- . Suitable manufacturing technologies and local production units: potential for developing the use of existing local skills, e.g. those of village blacksmiths. small multi-purpose production plants in rural areas for manufacture in small and medium-sized batches, making it possible, for example, to produce simplified transport equipment, the manufacture on a national or subregional scale of a number of vehicles and types of motorized equipment using the same power unit, for rural development, the possible configuration of a national handicraft-industrial fabric in metal-working and mechanical engineering that could be developed in countries without an industrial base.

The various technological routes in which experiments should be conducted have different socio-economic contents: village blacksmiths and craftsmen, small-scale enterprises, industrial units. They therefore include the essential component of manpower training. The method of analysing the technological complexity of capital goods<sup>2/</sup> would be used as an instrument in relation to agricultural machinery in order to define the various training programmes necessary in the light of the existing technological level and the level required for the projected manufacturing programmes.

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<sup>2/</sup> UNIDO, Technology in the service of development - ID/WG.324/4 - 19 September 1980. Document prepared for the Global Preparatory Meeting for the First Consultation on the Capital Goods Industry - Warsaw, Poland, 24 - 28 November 1980.

3. The start-up of intra-African co-operation and the expansion of external co-operation

The PADEMA Steering Committee would include representatives of African countries and organizations and of the international organizations concerned - OAU, ECA, FAO and UNIDO.

Information should be disseminated throughout the region. Information specifically related to subregional projects would be distributed at subregional level. That would imply either the establishment of permanent information bodies or the designation among the existing institutions of units that could support the activity of the Steering Committee for the Plan and the subregional committees. The establishment of a regional and subregional information system is of decisive importance for the organization of intra-African co-operation.

The main task of the Steering Committee would be to prepare the medium-term African Development Plan for Agricultural Machinery and Equipment, 1985-1990. This indicative plan would present the main national and subregional programmes selected and a programme of intra-African and international co-operation to assist in implementing them. It would in a sense be an extension in this field of AFPLAN (African Food Plan), prepared by FAO and ECA, since it would highlight the complex of problems involved in the production of machinery and equipment necessary to enable the African countries to achieve their food production and other agricultural targets.

Other activities could yield first results during this period:

1. The development of trade and co-operation between existing enterprises in different countries;
2. The conclusion of subcontracting agreements for the supply of metal or mechanical parts and components;
3. The establishment of coordination and, consequently, of a network of research and development centres, as well as the study of the establishment of subregional engineering and industrial research and development centres;
4. The promotion of subregional industrial plants: as specialized industrial plants manufacture goods in large production runs, they can be viable only in a subregional context, except in a few African countries;

5. Evaluation of manpower training needs for the handicraft and industrial sectors and, through the comparison of solutions arrived at, the formulation of a specific programme that should be integrated with the general plan;
6. The organization of international co-operation in order to contribute to the implementation, first, of the short-term programme, and later of the medium-term programme.

The 1982-1984 short-term programme would consist of a set of programmes of priority action on a national, subregional and regional scale, which would be complementary to and co-ordinate with one another. This approach should make possible great flexibility in mounting and implementing the short-term programme. Each country would be at liberty to decide whether to participate in one or all of the programmes.

The set of short-term programmes consists of the following elements:

1. The immediate action programme at national level;
2. The support programme for national decision-makers;
3. The priority subregional programmes;
4. The technological development programme for African agricultural and rural equipment.

These programmes are described in annex 1, pages 14 to 41.

#### B. The medium-term programme (1985-1990)

By definition, this programme would emerge as the result of the programme for the preparatory phase. It would therefore be premature to make an in-depth attempt to consider its content now. It depends on essential choices, for example, defining the scope of subregional programmes, which may reflect different political groupings. It depends on the choice of the policy for the integration of agriculture and industry and industrial options such as those suggested in Issue Papers Nos. 1 and 2. As points of reference, we have the opinions expressed by the African experts who took part in the surveys, who suggest initial orientations.<sup>10/</sup> It depends, finally, on the choices made during the

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<sup>10/</sup> These orientations are summarized in annex 2.

First Regional Consultation and thereafter on choices concerning the scope of operations planned in the course of the short-term programme, the resources that will be devoted to the latter and those that will be available for the long-term programme.

Subject to these reservations, it nevertheless seems valuable, as an illustration, to advance a working hypothesis derived from the complex of problems described in Issue Papers Nos. 1 and 2.

1. Most of the national programmes would be well under way during the period 1985-1990.
2. In line with the orientation of the short-term programme, subregional programmes would probably be confirmed for the period.
3. The national and subregional programmes would be differentiated according to the level of the existing industrial infrastructure.

For certain African countries, an infrastructure that would permit the production of simple capital goods, including agricultural equipment, is almost non-existent, while the nucleus of an infrastructure exists in others. All of these countries would have to advance during the period to a level at which they would achieve mastery of processes involving greater technological complexity, which would make it possible to extend the range of agricultural equipment that could be manufactured locally. <sup>11/</sup>

The manufacturing programmes would be the result of the level of demand ascertained, the technico-economic characteristics of the equipment selected, the evaluation of existing technical capacity, and the possibility of increasing the latter in a given period within the technological routes considered.

4. A similar set of programmes would later constitute the long-term programme; the latter would contain national and subregional and also, perhaps, regional components that would emerge as being of common interest to most of the countries. This would mean, in particular, certain research and development activities and above all industrial manpower training programmes.

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<sup>11/</sup> UNIDO has developed a method for analysing the technological complexity of capital goods. The analysis is based on the identification of 80 elements that characterize the technical production process (for example, forging, foundry-work, machining, etc.), each of which may have six levels of technological complexity. A sample of 308 different capital goods was analysed and a special study was made of agricultural machinery, on the basis of which technical data sheets were drawn up for more than 80 agricultural machines.

III. THE DESIGN AND ORGANIZATION OF PROGRAMMES: SUGGESTIONS  
FOR DISCUSSION DURING THE FIRST REGIONAL CONSULTATION  
ON THE AGRICULTURAL MACHINERY INDUSTRY

This Consultation will doubtless wish to avoid the pitfall that the "Plan of Action" should consist only of an inventory of generalities without any practical follow-up. For that reason, the following is suggested:

1. The Consultation should adopt a position on the principle of establishing an African Development Plan for Agricultural Machinery and Equipment and should discuss its possible content.
2. During the Consultation, it would be necessary to choose from among the activities selected for the short-term programme those that seem to deserve priority. It would probably be out of the question, within two years, to undertake and complete all the activities planned, although the latter will in time be indispensable. On the other hand, the Consultation may have to add other activities that have not been considered. It is therefore necessary to emphasize the "open-ended" nature of the proposals.
3. During the Consultation, trends or positions should emerge concerning desirable and possible subregional groupings in the field of the agricultural machinery industry.
4. The report of the Consultation could be submitted to interested Governments if the Consultation so recommends. On that assumption, the Governments would have to indicate whether they would participate in all or part(s) of the programmes suggested.
5. The African Governments would designate national focal points that, according to forms and procedures specific to each State, would act as national agricultural-industrial committees for agricultural machinery and rural equipment.
6. The Steering Committee for the Plan would include some representatives of these national committees and of existing subregional and regional institutions dealing with agricultural machinery, especially OAU, as well as representatives of the international organizations concerned - notably, ECA, FAO and UNIDO. Subregional committees should also be set up.

This Steering Committee - or these subregional committees - would submit one or more amended projects accompanied by details of the budgets proposed and possible sources of the necessary finance, whether national or from multilateral or bilateral aid. Obviously, the activities would be selected in the light of these financing prospects.

A recommendation should be made to "mount" the project politically, organizationally and financially as soon as possible.

7. The support of this joint enterprise by an African country would entail a kind of voluntary contract with the African community. The minimum commitment would be to designate a national focal point, transmit information considered essential and participate in at least one of the following four programmes: 1. The immediate programme of action at national level; 2. The support programme for national decision-makers; 3. The subregional priority programmes; 4. The programme of technological development for African rural and agricultural equipment. In return for this commitment, the participating country would receive a number of services: information, methodology for the determination of demand and industrial choices, analysis of technological complexity, aid in taking strategic decisions, results of research, the assistance of experts, aid in obtaining finance for projects.

8. PADEMA is at one and the same time both normative and flexible. It is normative because it suggests lines of integrated action for the period 1982-1990 and the rapid start-up of activities through the short-term programme (1982-1984). Without doubt, this start-up may be slower than expected in some countries. Nevertheless, it seems preferable to set a rapid pace for the programme and to give it wide scope. The First Consultation was, in fact, designed to give the initial impetus and create a new dynamism. PADEMA is, however, flexible because it offers a range of activities from which a selection will necessarily have to be made. It is also flexible because it is based on the voluntary principle and the specific characteristics of each African country.

9. It is suggested that an initial budget of the necessary resources should be drawn up in the light of the positions adopted and the choices made during the First Regional Consultation. It is already clear that contributions from organizations like FAO and UNIDO, whose regular programmes are already fully committed



for the period 1982-1983, would depend on extra-budgetary resources. Without wishing to underestimate the importance of the financial hurdle, it is felt that it should not be regarded as insurmountable, because a dynamic action programme that enjoys the concurrence and support of many African countries may well create favourable conditions for its own financing.

10. It is proposed that the Consultation should assign major importance to international industrial co-operation:

Although the discussion on the expansion of such co-operation should take place during the preparatory phase of the programme, it would be useful, during the Consultation, to make an initial survey of offers of co-operation in relation to the various activities envisaged.

Particular interest is attached to offers of co-operation that could come from developing countries that already have sound industrial experience in this field, such as China, India and Brazil, for example. The same also applies, clearly, to developed market economy and centrally planned economy countries, some of which have long been deeply involved in bilateral assistance programmes in the agricultural machinery sector.

The Consultation should provide an opportunity to take stock of the situation in this field and to give initial indications as to the reactions of the developed countries regarding the various fields of co-operation that would be opened up by the definition and implementation of the programmes envisaged. This would involve: (a) specifying the extent to which the developed countries would be prepared to step up their co-operation, continuing along present lines, (b) exploring the possibilities for co-operation on the new lines suggested, particularly in promoting new ways for mechanization, equipment, technology, production plants suitable for the needs expressed by the African countries, and (c) using for those purposes existing bilateral and multi-lateral co-operation machinery as well as the Investment Promotion Services established by UNIDO in seven developed countries.

11.. Finally, the First Regional Consultation on the Agricultural Machinery Industry brings together three groups of participants, each of which will have a special contribution to make:

African participants: It is for them to define their needs, adopt positions towards the proposal to establish national,

subregional and regional plans for agricultural machinery, selecting those specific proposals that seem to them to deserve priority and indicating how this joint enterprise could best be constructed.

The participants from the developing countries and those of the developed countries that are co-operating with Africa in this field:

It is hoped that they will intimate the present state of their participation and their interest in and possibilities for expanding such participation for the activities selected by the representatives of the African countries.

The participants from the international organizations: it will be for them to indicate the nature and extent of the services that they can provide, especially in the field of information, help in decision-making, and technical and financial assistance for the various programmes envisaged.

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A N N E X E S

- Annex 1: THE COMPONENTS OF THE SHORT-TERM PROGRAMME (1982-1984)
- CAP 1: Immediate action programme at national level
  - CAP 2: Support programme for national decision-makers
  - CAP 3: Priority subregional programmes
  - CAP 4: Technological development programme for African rural and agricultural equipment
- Annex 2: SELECTED EXCERPTS FROM THE CASE STUDIES CONCERNING PROPOSED RECOMMENDATIONS MADE BY THE AFRICAN AUTHORS
- Annex 3: EXTRACTS FROM THE REPORT OF THE SIXTH CONFERENCE OF AFRICAN MINISTERS OF INDUSTRY, 23 to 25 November 1981.

Annex 1

THE COMPONENTS OF THE SHORT-TERM PROGRAMME  
(1982-1984)

Four Collective Action Programmes "CAP" are presented which constitute the "backbone" of collective action by the African countries on the basis of voluntary commitments by each State. The content of these CAPs is linked to the twin objectives of meeting the urgent needs of the present situation and carrying out the necessary structural changes on the basis of intra-African and international co-operation and solidarity. The launching of these four CAPs during the period 1982-1984 would open the way for the design and implementation of the medium-term programme (1985-1990).

The four programmes proposed are as follows:

- CAP 1: Immediate Action Programme at National Level;
- CAP 2: Support Programme for National Decision-makers;
- CAP 3: Priority Subregional Programmes;
- CAP 4: Technological Development Programme for African Agricultural and Rural Equipment.

CAP 1: IMMEDIATE ACTION PROGRAMME AT NATIONAL LEVEL

I. The institutions

The country would set up a Committee for Agricultural Machinery and Rural Equipment in order to ensure the essential institutional co-ordination between at least the Ministries of Agriculture, Industry and Planning. This Committee would superintend all the necessary design and implementation activities with regard to national policy for agricultural mechanization and the supply of machinery. It would also be the focal point responsible to PADEMA. It would have a permanent secretariat which would have within it an information unit.

II. The content and implementation of CAP 1

A. Support measures for an integrated agricultural mechanization policy

Although every country has special characteristics, two types of necessary action seem to be common to most of them:

The financing of purchases of agricultural and rural machinery and equipment, and the immediate consolidation of the existing production apparatus.

(i) The financing of purchases of agricultural and rural machinery and equipment

The existence of an organized national market with adequate purchasing power is an essential condition for maintaining and strengthening production capacity for agricultural equipment. Unfortunately, today, the ever-worsening financial situation of many States seriously affects the level of orders and aid for peasant farmers in the purchasing of equipment.

It seems necessary to seek for new financing formulas (national, bilateral or international) that would enable peasant farmers to acquire essential equipment, to specify and guarantee the share of aid for the development of the food, agricultural or rural sectors that would be devoted to the purchasing of such equipment over sufficiently long periods, whenever possible giving priority to the purchase of equipment manufactured locally or even contributing to providing incentives <sup>12/</sup> for such local supplies. It is essential at the outset to "prime the

<sup>12/</sup> Major purchase order from EDF and USAID, part of which were paid for in advance, greatly helped in starting up the production of the UPROMA company in Togo in 1981.

pump" in order to break through the vicious circle of the peasant farmer's lack of purchasing power and to enable him progressively to increase his level of income. Every African State should raise the necessary resources to ensure a minimum rate of capital investment in this sector of agricultural and rural development, devote certain minimum amounts to the purchasing and use of rural machinery and equipment (equipment of all kinds that is produced by the mechanical engineering and metalworking sector represents an average of 50 per cent of capital investment in agriculture). Genuine development plans for agriculture or food production should be prepared, indicating in particular the volume of expenditure to be devoted to the purchase of agricultural machinery and equipment, selected in the light of the real needs of farmers and correctly specified. Agreements could be prepared between the State and the industrial enterprises (organized or individually) which would undertake to provide some of the equipment necessary, abide by quality standards and train the users, while the State for its part would guarantee a market for several years, an adequate price level and help the enterprise in certain key areas (credit for the financing of capital investment, manpower training, R and D activities, etc.). Industrial partners from other African countries or countries supplying technology or raw materials could take part. Such contractual arrangements established on a clear reciprocal basis would facilitate participation by local and foreign capital, and the granting of international financial or technical assistance.

The same possibilities also exist at the inter-State level, in particular for subregional development operations (river basins and homogeneous agro-ecological zones) whose development requires a large quantity of equipment and machinery over a long period.

(ii) The immediate consolidation of the existing production apparatus

The diagnosis of the present situation in 16 African countries has shown the harsh conditions under which many industrial or handicraft-type enterprises producing agricultural equipment must operate. The disappearance of these units would mean the loss of a capital asset in terms of experience, and the intensification of dependence on exporting countries. Thus, the first step towards the development of local production capacity must be assistance to and strengthening of existing capacity, both handicraft and industrial. Direct financing

of equipment and credit (see above) are both essential. These enterprises must also be helped by means of a number of simple measures (adequate price level, financing of working capital during the slack period, control of imports, financial assistance, supplies of equipment, and training of craftsmen, blacksmiths, etc.).

B. Information

Information plays a decisive role, both in order to enable national decision-makers to determine an integrated national strategy for agricultural equipment and for the organization of intra-African cooperation and trade. The information obtained should be soundly based, and its compilation organized in a continuous manner. Such information would relate to:

- . Identification of the production apparatus (industrial or handicraft enterprises, basic infrastructure): name of the enterprise, products manufactured, production technology and equipment, distribution systems, industrial partners and suppliers, research and development efforts, etc.
- . The market, imports, real mechanization and equipment needs;
- . The institutional apparatus and specific action with regard to agricultural machinery and rural equipment;
- . Various development projects being undertaken with the help of international organizations or in a bilateral framework;
- . Future projects.

Technical assistance regarding the information-collection methodology could be provided by UNIDO and FAO. The questionnaire jointly prepared by these two organizations for the implementation of case studies is an initial framework. All such information should be compiled in the form of one or more national monographs, prepared before mid-1983, which would constitute the basic material for the establishment of subregional and regional information networks (see CAP 3).

From diagnosis to a policy

Simultaneously, the national authorities would make an in-depth diagnosis of the situation with regard to agricultural machinery and equipment in their respective countries and would specify the strategies and action to be envisaged in the national, regional and international context. These elements would be contained in a "framework document", which should also be prepared before **end-1983**.

Then a meeting would be organized in the country open to all the national authorities and economic agents, international organizations participating in the implementation of PADEMA, and those engaged specifically in the development of the country, namely, banks, bilateral organizations and "supplier" countries. The objectives would be as follows:

- . To analyse collectively the problem of agricultural equipment and mechanization in the country and to discuss the proposal made by the country in the strategic framework document;
- . To endeavour to harmonize the various ongoing programmes;<sup>13/</sup>
- . To prepare a list of national priority projects (linked in particular to the improvement of food production) and to envisage measures necessary for their rapid implementation (particularly at the level of financing);
- . To identify activities of a subregional and/or regional nature that could be included as elements of the PADEMA subregional programmes (see CAP 3),
- . To assist the national authorities in determining their medium- and long-term strategies for agricultural equipment and mechanization, each organization specifying what form its assistance might take in the light of the guidelines and choices already formulated by the national authorities.

Finally, CAP 1 would lead in each country to the formulation of a medium-term national plan (1990 horizon) for the production of agricultural and rural equipment, which would be the national component of the PADEMA Regional Plan for the phase 1985-1990.

During this preparatory phase, countries that had undertaken to carry out CAP 1 could receive increased technical assistance from the technical organizations participating in the implementation of PADEMA (mainly ECA, FAO and UNIDO). Particular attention would be devoted to the Least Developed Countries.

The project sheet related to CAP 1 is on the following page.

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<sup>13/</sup> For example, projects of UNDP, the World Bank, ILO, FAO, ECA, UNCTAD, UNIDO, the plan of action against hunger being prepared in EEC, TCDC projects, action for the benefit of the LDCs, and all bilateral projects of any substantial weight.



Project sheet

CAP 1: IMMEDIATE ACTION PROGRAMME AT NATIONAL LEVEL

OBJECTIVES: To prepare a National Sectoral Plan for the period 1985-1990, and for that purpose: to evaluate the situation in the country, collect the essential information, and evaluate the situation with regard to subregional, regional and international co-operation.

OPERATIONAL  
CONTENT AND  
PHASES:

Establishment of a "National Committee" organizing the work in the country and acting as the focal point for the implementation of the regional plan (PADEMA);

Establishment of an information unit within the Committee;

Active phase for the compilation of information and national consultations (in 1982);

General meeting of national economic agents, identification of priority projects, recommendations for PADEMA (mid-1983);

OUTPUTS:

National medium-term strategy (1985-1990).

Framework document proposing the bases for the national strategy and action envisaged in the regional framework (1985-1990);

Identification of priority projects for the country and proposals for subregional action programmes;

Co-ordination of the programmes of the various assistance organizations.

PARTICIPATION  
IN WORK:

Mobilization by the national authorities of the economic agents interested;

Technical and methodological support by FAO and UNIDO;

Participation in the general meeting by the international organizations and partners operating in the bilateral co-operation sphere.

## CAP 2: SUPPORT PROGRAMME FOR NATIONAL DECISION-MAKERS

The structural readjustment between national production of agricultural equipment on the one hand and needs on the other makes it necessary for each country to define and implement an integrated mechanization/equipment strategy for its agriculture and the rural environment (see Issue Paper No. 1). Such strategies are practically non-existent in the African countries, where there is usually a definite break between agriculture and industry, and between industry and the handicrafts sector. One technical reason for that is the non-existence of decision-making aids, methodology for action, and practical guidelines that illuminate and direct the choices of decision-makers in designing strategies.

The proposed methodology deals with two components:

- Analysis of the real needs of peasant farmers and in agriculture in general, and determination of the basic choices with regard to rural development and mechanization;
- A practical diagnosis of the industrial production structures existing in the country, not only for agricultural machinery but also for mechanical engineering and metalworking in general and the subsequent development of outline national master plans for the development of mechanical engineering and metalworking linked with rural development and food production.

As far as this second aspect is concerned, UNIDO has prepared a general methodology for the diagnosis of industries producing capital goods and for the formulation of a strategy for such industries. <sup>14/</sup>

FAO and UNIDO are prepared together to help countries to formulate with them their national integrated strategies for agricultural machinery and equipment production and the required aids to decision-making.

### Implementation and Content of CAP 2

- (i) During the preparatory phase, five African countries would be covered by this programme. These countries would preferably have already

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<sup>14/</sup> UNIDO - Report of the First Consultation on the Capital Goods Industry - Brussels, Belgium - 21-25 September 1981.

defined the strategical foundations for their food and agricultural policies and should be representative of the diverse situations in countries in the continent. Two or three LDCs (Least Developed Countries) should be part of this sample.

Joint FAO/UNIDO missions involving national representatives would carry out the necessary work and surveys (beginning of 1983). The latter, turning to account the lessons drawn from the tests of the method, would prepare the bases for the integrated national strategy for mechanization/equipment in agriculture (1985-1990). The national plan would include specific integrated programmes and the programming of the necessary technical assistance, whether it should originate from international organizations such as FAO and UNIDO or from bilateral co-operation. This Plan would specify the fundamental mechanization options based in particular on suitable routes (see Issue Paper No. 1) and would specify for the industry the measures necessary to integrate the development of local production capacity for rural and agricultural for equipment within a national outline master plan for the development of the metalworking sector.

As far as the Least Developed Countries are concerned (in which this sector is very little developed) the promotion of agricultural machinery would exercise a linkage effect economically and technically.

(ii) In the later phase (1984), FAO and UNIDO, assisted by African experts would undertake the analysis of the results, make the necessary methodological adjustments and prepare documents for aid in decision-making or "practical guides for the formulation of a national strategy for agricultural mechanization and equipment supply.

The "guides" would then be distributed throughout all the African countries. They would be supplemented in the various countries by carrying out socio-technico-economic evaluation studies on the dominant mechanization systems (particularly tractorization) and systems for the production of agricultural equipment (particularly assembly units, small and medium-scale enterprises and forms of handicraft production). Some groups of experts could be set up for this purpose, working in parallel with the missions in the country. The "guides" and supplementary studies would constitute the tools for aid in decision-making.

(iii) Seminars for the training of African technicians and senior personnel would be organized to permit the application of this methodology for action in the other African countries.

The project sheet related to CAP 2 is on the following page.

Project Sheet

CAP 2: SUPPORT PROGRAMME FOR NATIONAL DECISION-MAKERS

**OBJECTIVE:** To establish a methodology for action in order to enable each country to have the necessary decision-making tools at its disposal for the design and implementation of an integrated operational mechanization strategy covering agriculture and industry.

**OPERATIONAL  
CONTENT AND  
PHASES:**

1. Experimentation phase in five countries (1982-1983)  
Joint FAO/UNIDO studies and missions with the participation of national representatives in order to test the methodology in interested countries;  
Application of the methodology to the formulation of a national mechanization/equipment structure for agriculture.
2. Result-consolidation phase (1983-1984)  
Refinement of the methodology, general compilation of national results;  
Additional tools: socio-technico-economic evaluation regarding the mechanization systems and the various types and structures of industrial production;  
Drafting of a "practical guide for help in strategic decision-making" and various technical documents;
3. Training and information of African decision-makers and technicians in the application of this methodology for action in each country concerned, for the preparation of the 1985-1990 plans.

**OUTPUTS:** National plans and integrated action programmes for the countries "tested" during the preparatory phase;  
A methodology for action and various decision-making aids for all the African countries;  
Strengthening of the ability to ascertain needs, and later increased capacity for negotiating technical assistance agreements.

**PARTICIPATION  
IN WORK:**

National authorities (committees and also users, suppliers and rural organizations, etc.);  
FAO and UNIDO: preparation of the methodology, missions to the countries, assistance in evaluation studies, technical meetings of experts, preparation of comprehensive review documents, organization of training activities.  
African experts.

### CAP 3: PRIORITY SUBREGIONAL PROGRAMMES

The subregion seems today to be an essential framework and unit to permit the viability of industrial-type production plants, the pooling of resources that are limited at national level, and the development of intra-African solidarity, which should also be realistic and operational. Politico-economic or financial subregional institutions exist in Africa and have formulated programmes for the development of agriculture and food production, some of which have a bearing on agricultural machinery; in particular, inter-State institutions have been established for the development of regions or river basins <sup>15/</sup>. However, immediate efforts should be made to harmonize and strengthen ongoing programmes, eliminate the constraints of all kinds that still lie in the way of subregional co-operation, and design structured subregional action programmes for the medium term (1990). The regional dimension is the complement of the subregional dimension. Later, it will be necessary to consider the specific tasks that are regional in nature, which implies a clear view of activities common to the subregional programmes.

#### The organization and content of the CAP 3 programme

##### I. Institutional organization

The work carried out at the national level (CAP 1 in 1982 and the beginning of 1983) would lead to the formulation of precise and structured proposals concerning the fields necessary for the development of co-operation in the subregion concerned. That would be possible, since some inter-State organizations and institutions are already participating in this dynamic subregional process (economic and political subregional organizations, agencies responsible for the development of river basins or great lakes, and subregional banks).

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- 15/ Common African and Mauritian Organization;  
West African Economic Community;  
Economic Community of West African States;  
Customs and Economic Union of Central Africa;  
Organization for the Development of the Senegal River;  
Economic Community of the Great Lakes Countries;  
Permanent Inter-State Committee on Drought Control in the Sahel.

A Committee for Agricultural and Rural Equipment would be set up within each subregion, the members of which would include representatives of the various national Committees and the representatives of the subregional organizations concerned. This Committee would constitute the focal point for PADEMA in each subregion and would carry out the general designing, organization and monitoring of all the action programmes. It would have a permanent structure, responsible in particular for gathering and disseminating essential information.

## II. The tasks

Under the responsibility of each subregional committee, the following tasks would be undertaken in the period 1983-1984:

- . Co-ordination and strengthening of existing forms and structures of subregional co-operation:
- . Diagnosis of the obstacles for the developing of such co-operation and identification of the main measures necessary:
- . Establishment of a priority action list and analysis of the means necessary for its immediate implementation (such action is described in detail below):
- . Definition of possible and necessary fields for the strengthening and reorientation of international co-operation with a view to full participation in a dynamic subregional process, the identification of foreign partners and desirable action by them:
- . Carrying out the work necessary at the level of the subregion in question for the launching and implementation of the CAP 4 regional programme, which concerns the promotion of suitable equipment and technologies and in some way constitutes the "heart" of the PADEMA Action Plan:
- . Preparation of an outline plan/integrated programme for sectoral subregional co-operation for the period 1985-1990, covering the essential fields of co-operation (information, subregional industrial development, research and experiment on agricultural equipment and suitable technology, the development of subregional networks and institutions, training, financing, etc.).

III. Priority action would cover the following fields:

A. The collection and dissemination of information

National enterprises, research centres or countries are not well aware of what is happening beyond their own territory. That constitutes a major obstacle for the development of co-operation and also with regard to the quality of the decisions taken, to the extent that "knowledge is power", in which flows and exchange of information precede and even engender flows of products, technology and know-how, human exchanges, economic and financial exchanges.

In the preparatory phase (1983-1984), the distribution of information corresponding to the priority needs of the various national and subregional economic agents should be developed through the design and establishment of information and trade structures and networks.

The principal questions that emerge are as follows: What are the information needs (nature of the requesters, content of information)? What are the existing information networks? What are the technical facilities for the creation, structuring and dissemination of the most suitable information?

Using the information material prepared for the national plans (see CAP 1), the essential function in each subregion would be to disseminate information concerning the characteristics of mechanization, of the subregional market for some types of equipment, a list of subregional enterprises, the activities of the subregional institutions, ongoing projects, etc. Distribution of this information would contribute directly to the promotion of specific action, such as the organization of technological exchange between African enterprises and institutions, between African and foreign partners, the establishment of specialized networks, the formulation of research programmes, the establishment of a general subregional framework for the development of basic metalmechanical engineering and working industries, the harmonization of national projects, etc.

B. The promotion of subregional industrial units

(Production of equipment such as engines requiring large markets, steelworks, forges, foundries, etc.)

As far as industrial-type projects are concerned (fairly large production runs, a work-force of 200 persons or more) it should be realized

that such units specializing in agricultural equipment cannot be conceived today unless they are in a subregional context (except in a few North African countries and Nigeria) because national markets are too small at present.

C. Compilation work

On the basis of the work done and the information gathered during the preparatory phase (1982-1984) in the various countries and the subregions, compilation work could be carried out under the main responsibility of the three organizations ECA, FAO and UNIDO. For example, such compilation work would include:

- . A "map" of agricultural mechanization and needs, for the continent, by subregions and countries:
- . A "sectoral industrial map" the necessity for which was emphasized by the African Ministers of Industry <sup>16/</sup>.

The establishment of a relationship between the industrial map and the map of the market and needs would provide a number of useful items of information, for example, regarding potential markets and subregional industrial projects, zones of specialization, potential fields of cooperation between enterprises, etc.

D. The strengthening and/or establishment of subregional centres/institutions for engineering, technology, networks of research and development centres for agricultural mechanization which are essential elements for the implementation of the CAP 4 programme.

E. The conclusion of subcontracting agreements for the supply of metal or mechanical parts and components.

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<sup>16/</sup> The over-all table of industrial enterprises producing agricultural equipment presented by UNIDO in the Diagnostic Study (UNIDO/IS.288) and Issue Paper No. 1 (ID/WG.365/1), which is provisional, proceeds along these lines.



#### IV. Final results

- . At the level of the subregions, 1985-1990 plans would be prepared:
- . These subregional plans would be supported by regional programmes.
- . Specific regional programmes would concern areas common to all the African countries (for example, training and technology);<sup>17/</sup>
- . An indicative plan for development in Africa of the production of agricultural and rural equipment would be formulated at the end of 1984. It would analyse the present situation for the continent as a whole, problems at the horizon 2000, the principal national, sub-regional, regional and international action programmes, and projects envisaged in the period 1985-1990.

To some extent it would be the logical continuation of AFPLAN (African Food Plan) prepared by FAO and ECA, high-lighting the implications and responses from the side of mechanization and industrial production to African food production targets. The project sheet related to CAP 3 is on the following page.

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<sup>17/</sup> They would be based in particular on existing institutions (for example, ARCEDEM at Ibadan, ARCHTR at Nairobi for training, ARCT at Dakar for technology); ECA, for its part, in co-operation with FAO, UNIDO and OAU, has set up a regional programme concerning the third UNDP programming cycle (1982-1985) intended to promote intra-African co-operation for different aspects of the production of agricultural equipment. This programme should be supported and should constitute an integral part of PADEMA,

Project sheet

CAP 3: PRIORITY SUBREGIONAL PROGRAMMES

- OBJECTIVE:** To organize, in the short and medium term, the effective development of intra-African co-operation in the sector of agricultural and rural equipment, especially in the fields of information, the promotion of industrial units and technology.
- OPERATIONAL CONTENT AND PHASES:**
- . Institutional organization in the African subregions.
  - . Diagnosis of the achievements of, and obstacles in the way of intra-African co-operation.
  - . Launching of priority action for gathering and distributing information, promoting subregional industrial units, strengthening subregional institutions, harmonizing ongoing subregional programmes and the production programme of existing units.
  - . Comprehensive reviews and preparation of subregional plans and a regional plan.
- OUTPUTS:**
- . Immediate organization and co-ordination of projects and co-operation in each subregion.
  - . Preparation of priority subregional projects and programmes.
  - . Development of integrated subregional co-operation programmes for the period 1985-1990, specifying the role of international co-operation.
  - . Formulation in 1984 of a regional indicative plan for the development of the production of agricultural and rural equipment during the period 1985-1990.
- PARTICIPATION IN WORK:**
- Representatives of national Committees for Agricultural Machinery and Equipment:
- Subregional organizations and institutions:
- ECA, FAO, OAU, UNIDO and other multilateral aid organizations.

CAP 4: TECHNOLOGICAL DEVELOPMENT PROGRAMME FOR AFRICAN  
RURAL AND AGRICULTURAL EQUIPMENT

The attempt to match production quantitatively and qualitatively with national demand for agricultural machinery and equipment demands that each country should concentrate efforts on the promotion of a production apparatus whose characteristics will be in line with reality in Africa and will serve national objectives. This concept of adaptation which relates to three related elements the manufactured product/production technology/organization and structure of production does not entail any a priori judgement regarding the very nature of each of these elements: the technology may be simple or complex, the production unit small or large, autonomous from or interdependent with other units. The important thing is not to impose any given configuration regarding the production system but to develop the production structures that meet the needs, in the environment, overcoming the product/technology rigidity that is traditionally noted in industrial projects designed according to the model of the industrialized countries.

This promotion of suitable technologies and structures for the production of agricultural equipment is of paramount importance and constitutes a collective challenge to the African countries. Its success depends on two complementary elements:

- The concrete formulation of models for mechanization and equipment and machinery that are genuinely suited to the needs of the African countries, in particular to the large mass of peasant farmers;
- The development of technologies and forms of production units corresponding to existing capacity in Africa, to the existing levels of the industrial fabric, and to major constraints (the size of markets, materials that can be used etc.)

CAP 4 constitutes the genuine heart of the set of programmes proposed. In view of its importance, it is presented below in the form of two interdependent subprogrammes related to the two elements mentioned above.

A. CAP 4a RESEARCH, EXPERIMENT, PROMOTION OF MECHANIZATION SYSTEMS  
AND OF SUITABLE RURAL EQUIPMENT AND MACHINERY

Very few African countries are in a position to ascertain clearly today the future demand for agricultural and rural equipment, far less the genuine needs of the peasant farming sector. While demand for tractors may be expressed easily (even if there is no need for them), needs that exist cannot be expressed owing to the absence of purchasing power or ignorance of the need itself or even of the physical non-existence of the necessary equipment. This inability constitutes a fundamental obstacle to the development of local production capacity for agricultural equipment. Therefore there is an essential problem, namely, the determination of needs and demand, for each country, subregion and even the entire region. This problem makes it necessary in particular to determine the types of agricultural mechanization and equipment that are suited to the needs of the peasant farming sector and for the mechanization of food crop production (see Issue Paper No. 1).

Programmes CAP 1, CAP 2 and CAP 3 assist in this expression of demand, particularly at the national level. But each country on its own, each institution, is not capable of carrying out the surveys, the research and experimentation work required by this promotion of the technologies of mechanization and suitable equipment, whereas many needs are common to several countries. Therefore, here, an organized effort on the sub-regional and/or regional scale is needed for analysis, research and experimentation that would make it possible, after the end of the preparatory phase, to achieve harmonization of ongoing efforts, and to select, define and launch research programmes on equipment or technologies essential for a large number of African countries, having defined concretely the specifications and performance of certain types of machinery and having ensured that this work and information is transmitted to local engineering firms and enterprises.

The organization and content of the programme

A first immediate effort should be made to assist work and research that is already going on, specially on the basis of the information gathered at the national level and compiled in the framework of the CAP 3 programme. The results of this work would be distributed and harmonized.

A variety of research and experimentation projects should be conducted, mainly in the framework of existing African institutions, with the possible co-operation of foreign institutions that have acquired good experience in the field, which would make it possible at the same time to benefit from relevant technological innovations. Some major subjects for research and experiment are proposed here:

- . Determination of the basic equipment for peasant farmers by homogeneous socio-ecological zones<sup>18/</sup>;
- . Research on appropriate forms of mechanization based on hand labour, draught animals and motorized equipment;<sup>18/</sup>
- . Launching of research programmes on:
  - Mechanization in production of tubers;
  - Equipment for harvesting rice;
  - Storage equipment at the village level.
- . Research on mechanization choices in the light of the energy constraint in rural areas (the possibility of basing the rural development of a region on electricity, biomass, solar energy, etc.);
- . New mechanization technologies and types of equipment required in relation with the development of the minimum tillage technique.

All this work would be widely distributed and a comprehensive evaluation of it would be made at the end of the preparatory period (meetings with the research centres, at the subregional or regional levels, etc.) leading to a comprehensive proposal for a regional programme of action in this field for the period 1985-1990.

The project sheet related to CAP 4a is on the following page.

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<sup>18/</sup> See Issue Paper No. 1, part 3.

Project sheet

CAP 4a: EXPERIMENTATION AND PROMOTION OF SUITABLE MECHANIZATION  
SYSTEMS AND RURAL AND AGRICULTURAL MACHINERY AND EQUIPMENT

**OBJECTIVE:** To design, experiment on and promote mechanization systems and rural and agricultural equipment suited to the needs of peasant farmers, food production and the conditions in the environment.

**OPERATIONAL  
CONTENT:**

First phase: to identify, evaluate, disseminate information on and assist ongoing experiments and programmes. To ensure their co-ordination and strengthening. To identify relevant foreign experience. To promote the exchange of experience between countries.

Second phase: With the partners interested at the level of the subregions or the region to evaluate the principal unsatisfied needs, define priority research programmes, and share out the work among the existing institutions, whose facilities would be strengthened.

**OUTPUTS:**

The design of and experimentation with new ranges of equipment corresponding to the genuine needs and constraints of the African environment; distribution of information on suitable technologies and equipment developed in a given country to benefit other countries;

Co-ordination of ongoing work in the institutions;

Help in the ascertainment of needs and in the formulation of mechanization options in a country or subregion;

Preparation of a programme for 1985-1990.

**PARTICIPATION IN  
THE WORK:**

National level: Centres for Agricultural Machinery, research centres, universities;

Subregional level: Subregional institutions and organizations;

International level: FAO, "supplier" countries for suitable equipment, mechanization centres.

B. CAP 4b: The development of African capacity for the design and  
and manufacture of agricultural and rural equipment

The quantitative growth of African production of agricultural and rural equipment is linked to two complementary constraints which must be eliminated: the "design" level constitutes the key for practical matching between demand and the production apparatus, the technologies and production units level.

The design and development

It conditions the linkage between supply and demand in that it expresses, through the design of equipment, consideration of the users' requirements, the function of and conditions for the use of, such products in their environment, the possibility of utilizing technologies dominated by the local production apparatus (either existing or to be established) and available materials, reducing the problems of maintenance (by standardization and reduction of the number of parts) and technological dependence. It determines the possibility of adapting imported products to local conditions of use and manufacture and to utilize local suppliers (forge, foundry, etc.). In a word, it constitutes the key to the development of an autonomous technology. This design function cannot carry out its role in the sector of equipment intended for agriculture for several reasons:

- Human engineering capacity is very inadequate, in particular in enterprises (see diagnosis) or undervalued;
- The needs of the farming sector are badly expressed and when they are expressed, transmission to the engineering and industrial sector is inefficient, particularly for institutional reasons (poor liaison between the Ministry of Agriculture, the research and experiment centres on agricultural machinery, the Ministry of Industry and the manufacturing enterprises);
- It very often proves impossible to pass from the stage of the prototype to the production of initial batches of products for reasons of financing, lack of any guarantee of a market, even the distrust of the national authorities, who prefer to continue importing traditional foreign equipment for various reasons (price competition, reputation, business links, etc.)

The results achieved and the work going on remain at the local level

cannot attain a sufficient threshold of reputation or recognition. On the other hand, it is rarely possible to benefit from "external" research work and technological innovations.

#### Technologies and forms of production

The development of national production capacity for agricultural equipment should not and cannot be confined to adopting exclusively one of two extreme solutions, namely the standard industrial unit, designed on the financial and technological pattern of the industrialized countries, on the one hand, or the village blacksmith-craftsman, on the other hand.<sup>19/</sup> The high capital investment costs, the level of production runs, the difficulty of mastering the technology and organizational aspects by local manpower, the continuing dependence on foreign countries for supplies of materials and components, the rigidity of the link between the manufactured product and the relevant technology are the main obstacles to the first model. On the other hand, this type of unit is appropriate as far as **heavy** industries are concerned (in which technological alternatives are rare), the production of complex items (engines for example) for sub-regional or national markets of adequate size and when a certain technological and industrial level exists. The activity of the village blacksmith also has its advantages and limitations: he is close to the user, he can manufacture and maintain simple tools and equipment. But his production capacity, the nature of his materials and the level of technical complexity at which he operates limit his production potential. Generally, the small and medium-scale enterprise dominates in the African countries, but the problems encountered show that it cannot, either, perform all the necessary functions. In practically no African country is there a minimum production fabric that is organized and interactive and can correctly satisfy the national market for agricultural equipment.

Thus it appears essential to contribute to the emergence of new types of decentralized production units, closer to the rural environment in which their products will be used, which progressively gain mastery of the basic technological routes and participate in the organized development of a basic production fabric, the flexibility of which would be based on relatively versatile production equipment which would make possible diversified production, playing an active role in the creation of jobs and the revival of rural activities. In view of the diversity of mechanical sub-assemblies

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<sup>19/</sup> Similarly, the mechanization technologies cannot be reduced merely to the alternative of hand tools or tractors.



that make up one and the same machine, the diversity of functions to be performed (design, manufacture, maintenance and repair, supply of spare parts, raw materials and components, etc.), no solution should a priori be excluded regarding the nature or origin of productive forces that could participate in the development of production capacity. On the contrary, it is necessary to make use of all existing potential in the country or outside it. It must be remembered that the sources of technological innovation have often been external to the agricultural machinery sector itself. Mechanical workshops linked with the rise of the automobile can carry out the maintenance of agricultural equipment. A unit for the manufacture/assembly of cars can be expanded to incorporate an assembly line for tractors. In another field, a plastic injection machine could provide a whole range of special agricultural products (irrigation hoses, fermentation vats, tubs, etc.), without forgetting wooden articles, which are too often neglected. Conversely, an activity not linked to agricultural machinery may be indispensable for the profitability of a production unit (for example, the flour milling units attached to some blacksmiths' shops in Mali).

#### The organization and content of programme CAP 4b

The development of design and engineering capacity related to rural and agricultural equipment should be sought at different levels, particularly at the subregional and regional levels. Steps should be taken to upgrade, organize and disseminate the results of ongoing work, existing agencies, working at the level of the industrial enterprises themselves and establishing the institutional conditions for collaboration between agriculture and industry. Furthermore, specialization and complementarity between local technological support centres (working at the rural level, with the craftsmen and the small production units), national centres, subregional and possibly regional centres should be ensured.

Specialization on lines of research by centre and/or subregion would be sought according to the dominant speciality. It would be necessary to launch major research projects (the development of transport equipment, the design of ranges of equipment using one and the same power unit<sup>20/</sup>), organize competitions and exhibitions of the equipment produced. All the

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<sup>20/</sup> For example, a French automobile firm has just developed a complete range of more than 10 types of rural motorized equipment using the same engine, a standardized design, which can be manufactured in one and the same factory. The products are motor pumps, electricity generators, welding units, refrigeration units, small concrete mixing units, well-drilling machines (water), small agricultural tractors, dumpers, shovel loaders, rural transport chassis.

thinking and action in this area of design and engineering should logically be conceived of in the general framework of metalworking activities, slanted towards agricultural and rural equipment as priorities.

UNIDO has played an active part in the recent past in the promotion and general thinking on appropriate technology.<sup>21/</sup> Together with OAU, the organization also held an important meeting, the joint OAU/UNIDO Symposium on Industrial Technology for Africa, from 5 to 11 November 1980.<sup>22/</sup> From 25 September to 8 October 1982, UNIDO is organizing a technical seminar dealing precisely with the "design and development" of agricultural equipment used in Africa, to be held in Cairo, Egypt. This seminar will meet in the premises of EIDDC (Engineering and Industrial Design and Development Centre) and will be attended by representatives of some 20 African countries, China, India, the specialized agencies and some international companies that have conducted interesting experiments. The seminar will make possible the communication of information on experiments carried out by the different participating countries, consideration of the obstacles encountered and the main possible lines for developing African design and engineering capacity, not only at the level of the products themselves but also at that of manufacturing technologies. In the light of the discussions and recommendations of this Regional Consultation, the seminar could fulfill the role of a technical expert group and propose a number of priorities, precise recommendations for action programmes (information, research, institutional machinery, etc.) for the concrete implementation of the regional plan of action in the field of the design of agricultural and rural equipment.

As far as the technologies are concerned, one priority will be to identify and evaluate technologies and original forms of production developed in the African countries (institutions, enterprises), the information work carried out in the framework of the CAP programmes would

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<sup>21/</sup> International Forum on Appropriate Industrial Technology, November 1978. Publication of monograph No. 4 on appropriate industrial machinery and implements. (ID/WG.232/4).

<sup>22/</sup> Report of the Meeting ID/WG.332/11, 22 December 1980.

be of great value in this respect. Rapid assistance, promotion and dissemination of such experience could be proposed.

A major programme for research and experimentation should be worked out

The following lines of action could be considered:

- . The technological potential for the development of the general blacksmithing sector (technical processes that could be mastered, equipment and design necessary, training, forms of **association**, etc.
- . Design and experimentation with small rural production units, of a multi-purpose nature, either in the sector of cutting and welding or metalworking.
- . Research on the design and local manufacture of a number of **motorized stationary and mobile equipment of small and medium power meeting the priority needs for mechanization and transport in rural areas**, that could be manufactured in small and medium production runs, at the national or subregional level;
- . The design and local manufacture of simplified motorized equipment in workshops in a rural area;
- . Technico-economic research on the possible configurations of a handicrafts-industrial fabric that could be developed in countries without an industrial base in which the **manufacture/maintenance of agricultural and rural equipment should exercise a linkage effect**.

The external partners, from developing or industrialized countries, could participate actively in such research, and should be identified and associated in the process. Pilot plants could be established. Technical documents would be prepared and distributed, helping to guide co-operation efforts in the technological field, modifying the characteristics of industrial projects envisaged by the African countries or proposed by the "supplier" countries.

The project sheet related to CAP 4b is on the following page

Project sheet

CAP 4b: THE DEVELOPMENT OF AFRICAN CAPACITY FOR THE DESIGN  
AND MANUFACTURE OF SUITABLE AGRICULTURAL  
AND RURAL MACHINERY AND EQUIPMENT

OBJECTIVE: To promote in the African countries a vigorous and lasting increase in the production of agricultural and rural equipment through the development of design and engineering capacity and the rise of technologies and production units based on the mobilization of existing productive capability, the progressive mastery of technology, and adaptation to real needs and the environment.

OPERATIONAL CONTENT

AND PHASES:

- . Identification and evaluation of existing capacity and ongoing experiments \*/ in enterprises and institutions, with regard to the adaptation and design of agricultural equipment, manufacturing technology and various forms of production (handicraft, industrial and "mixed"):
  - . Dissemination of results and information, exchange of experience, harmonization of action, etc.
  - . Launching basic research-experimentation programmes \*/ centred on existing enterprises and institutional machinery (engineering, training, and technological support centres):
    - . Use of international co-operation, especially for the incorporation of relevant technological innovations:
    - . Formulation of a technological programme for the period 1985-1990 - study on its practical organization and financing.

OUTPUTS: -Co-ordination and strengthening of ongoing action in enterprises and institutions:

- Launching a first organized research-experimentation programme based on a strengthened African institutional framework;
- Development of a regional technological programme for the period 1985-1990, as a principal element of the medium-term PADEMA Plan:
- Increased control of imports and the transfer of technology:
- The emergence of new adapted and complementary forms of artisanal-industrial manufacture meeting the equipment needs of the rural and peasant environment and raising the national technological level.

PARTICIPATION

IN WORK:

African countries (Ministries of Industry, enterprises, technical centres, etc.), subregional and regional engineering and technological institutions, industrial and public sector partners from the "supplier" countries and international organizations (ECA, UNIDO, FAO, ILO, etc.).

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\*/ Possibly to be dealt with in the Seminar to be held in Cairo (see text).

SELECTED EXCERPTS FROM THE CASE STUDIES  
CONCERNING PROPOSED RECOMMENDATIONS  
MADE BY THE AFRICAN AUTHORS

The quotations below have been extracted from the case studies with the purpose of stressing the original link between the propositions mentioned in Issue Paper No. 3 and the analyses and propositions made by the fifteen African experts, authors of the studies. They are further intended to concentrate on one or several themes brought up by these authors in light of their respective national context and to recall to mind the primary importance of specific actions to be undertaken at the national level and the efforts of co-operation which are necessary at the sub-regional, regional and international levels.

The choice and contents of these extracts remain the sole responsibility of the UNIDO secretariat.\*/

ALGERIA

The role of regional and international co-operation

- "The following advantages of such co-operation may be listed: the possibility of achieving trade economies when launching the production of components or complex products, by the existence of markets which are larger than the local market alone, the increase in commercial trading between these countries, the possibility of the joint launching of design and research work to develop products better suited to local cultural conditions, a considerable increase in the power of negotiation by these countries when facing the holders of technology and components, obtaining better financing formulae, the possibility of extending the agricultural machinery industry to the other engineering industries and to basic facilities (foundry work) which would increase the levels of integration and commercial trading. But this form of co-operation is a very difficult process, coming up against numerous constraints of all kinds. In fact the concept of regional co-operation goes against the habits of national planners, who are unable or unwilling at the present time to look beyond the national context. At another level the projects for regional co-operation assume in most cases medium-term profitability and even long-term profitability, and this is difficult for many countries to accept since they hesitate to take major risks without any guarantee of immediate advantages.... Every scheme for industrial co-operation between countries assumes a level of efficiency comparable to that of a multinational company."

- This leads to a recommendation that it is essential to undertake, at this stage, major actions for spreading information.

It is absolutely essential that those countries which wish to co-operate should be fully informed of the projects envisaged by each of them, and of the situation of the agricultural machinery industry as it prevails in each country. Within this framework, the role of UNIDO in collecting together the information and circulating it is essential."

(Smail SEGHIR, Technical Assistant Director,  
Directorate of Mechanical, Electrical and Electronic  
Industries, Ministry for Heavy Industry, Algeria)

\*/ The time available did not permit consultation with the authors.

BURUNDI

- "The production of agricultural machinery cannot be contemplated except within the framework of a regional co-operation scheme, i.e., within the Economic Community of the Great Lakes, as Burundi, in addition to having extremely limited human resources, lacks both a market of sufficient size and confirmed raw materials."

- "In order to be able to produce agricultural machinery, the Great Lakes region must have the necessary raw materials and a basic industry. At the present time, Zaire would appear to be better positioned than the other two countries, and for this reason it should relaunch its stalled iron and steel industry and also resume operation of the Kisangani iron deposits. At the same time, road and rail communications between the three countries should be upgraded."

(Léonard NTIBAGIRIRWA, Director of the Department for Industry, Ministry for Commerce and Industry, Bujumbura)

CAMEROON

- "In Cameroon, if industrialization is to result in a respectable degree of self-sufficiency by the end of the decade, intensive efforts should be made on the following: a policy of flexible and quick credit, establishment of a system of rural craftsmen, trained blacksmiths and organized small- and medium-sized enterprises, well established with clear commercial channels, rapid development of machinery adapted to local conditions (particularly for the poorer farmers), effective training for the peasantry in general, continued incentives for the extension of production, encouragement of investors in the field of mechanization with incentives for a real transfer of technology, a willingness to embark on subregional, regional and international co-operation."

- "UNIDO could organize exchanges of information among different countries with similar problems and between them and developing or developed countries which can help them (meetings between research and development centres, decision-makers, study teams, ...) help the existing national centre CENEEMA to set up a small experimental unit to construct prototypes in the form of test series, to establish the system of rural craftsmen after market research in specific requirements due to differences in ecological zones."

(Ernest ELA EVINA, Director of CENEEMA (Centre National d'Études et d'Expérimentation du Machinisme Agricole), Yaoundé)

EGYPT

- "With respect to hand tools and animal-drawn implements, the Government has to assist the artisans in rural areas by provision of simple designs, marketing assistance and suitable materials and encourage the production of the village artisan through provision of loans at concessional rates."

- "With respect to intermediate equipment, the Government has to develop the basic supporting industries, develop the existing facilities by providing the investments required for expansion and promotion, encourage co-operation with other developed countries in product development and the manufacturing and marketing of appropriate products."

- "Improved actions:

Better management of machines by farmers and custom operators to improve the contribution of equipment to increase farm production, improve repair facilities and availability of spare parts which would have the same effect as increasing farm equipment stock, modernize local manufacture capacity for farm equipment to ensure an adequate supply of new types of machines to meet Egyptian agricultural requirements,... increase the supply of trained mechanics to man the local repair facilities essential to efficient repair and maintenance of farm equipment."

(Mahmoud HELMY ZAKY, Projects General Manager,  
NASR Automotive Company, Cairo)

ETHIOPIA

- "The most critical constraints that will face engine-powered mechanization at the present time is likely to be the foreign-exchange constraint, aggravated by the prevailing international inflationary situation..."

- "This means that under Ethiopian conditions (roughly phase I above), two broad approaches for meeting the needs of mechanization must be considered simultaneously:

- . indigenously-based development of relatively simple machines and implements suited to the varying conditions that prevail in the peasant sector.
- . engine-powered machinery to be selectively deployed in the state farm sector and in the peasant sector provided that in each case the micro-level considerations are fulfilled."

- "Policy recommendations: the necessity for comprehensive development planning, the rational use of available resources, a relatively self-reliant process of development, the need for much research on the national and technological aspects of agricultural production, the need for early attention to institutional developments and to the development of technical capacities, the need to avoid the danger of unrestrained commitment to engine-powered mechanization in the present stage of socio-economic development of the country."

(Dantew G. GIORGIS, National Metalworks Corporation,  
Addis Ababa)

KENYA

- "It appears that past efforts in mechanization have been misdirected and the real needs of mechanization in terms of tools and agricultural power have not been met. The main reason is that the effect of mechanization on production and employment was not and is still not well understood. It is recommended that farm-level analysis of needs followed by a careful selection of appropriate equipment based on world-wide experience be done,..."

- "After testing on the field and checking acceptance by the farmers, the next stage is to manufacture a limited number of pieces of equipment.... At this time local entrepreneurs who can manufacture and provide repair and maintenance service should be identified and involved. Moreover, the necessary credit schemes and market opportunities for increased output expected must be organized. Once a prototype has been designed, produced and fully tested by agricultural engineers, it must be handed over to production engineers who will determine the most appropriate design for local manufacture. It is therefore recommended that a design and development centre be established."

- "In the long run it is quite obvious that energy for agriculture and domestic consumption mainly derived from humans, animals and wood will be a serious constraint to development. There is an urgent need to study the possibilities that exist in the biogas, vegetable oils and solar energy sources. A rural energy centre is therefore necessary..."

(Gichuki MUCHIRI, Chairman, Department of  
Agricultural Engineering, University of Nairobi)

MADAGASCAR

- "If an information centre on agricultural machinery existed for each country, subregional, regional and international co-operation would be facilitated. The centre could provide information on its country's supply and demand situation. It would have to study the actual demand for equipment and implements in the country, to disseminate information located abroad, to collect and analyze information on different manufacturing processes (techniques, machine tools, raw materials)."

- "Recommendation: to develop existing industries with a view to achieving the objective. It must be underlined that the market for agricultural equipment in the developing countries is relatively restricted at the present moment. This industry should therefore diversify its activities in order to make them profitable: manufacture of other types of equipment, marketing and selling of other articles, repair work, maintenance and after sale service."

(Emmanuel RANDRIA-HARVEL, General Director of  
SIDEMA (Société industrielle pour de développement du  
machinisme agricole), Antananarivo)

MALI

- "Key recommendations: convert the Agricultural Machinery Division into a national centre so as to create and sustain a coherent and on-going policy of agricultural mechanization. Develop, within the national centre, a design office where engineers and agronomists can collaborate. Develop the training and equipping of artisan blacksmiths so that the manufacture of animal drought equipment can be entrusted to them in the long term. Assist the co-ordination of the activities of these smiths by stimulating the creation of a co-operative union of smiths. Start up prospective studies on export markets so as to improve the situation of SMECMA. Create basic installations such as industrial forging, and assist the development of those which exist, such as foundries. Favour inter-African consultation on the problems of industrialization. It is at this level that UNIDO can act. This same organization could establish a data and reference bank which is necessary for the work of a national centre for agricultural machinery"

(Dramane ZERBO, Director for Agricultural Machinery,  
Ministry of Agriculture, Bamako)

NIGERIA

- "Past mechanization endeavours, relying almost exclusively on imported agricultural machinery, have not produced the desirable transformations in our agricultural production functions. Agriculture, being the largest sector of the Nigerian economy, has the potential of forming a viable basis for industrial take-off in Nigeria provided that the challenges of agricultural mechanization are effectively met. To realize this agricultural potential, we must dispense with our former simple-minded solution of heavy or exclusive dependence on foreign machinery and indigenously design, develop and manufacture agricultural machinery which are suitable to climate and crops and within the managerial ability and financial reach of the farmers. The time to initiate local manufacture of agricultural machinery is now. The various Governments of Nigeria are ready and well disposed for it; the farmers are waiting; the necessary technical manpower for a start is available; sufficient basic infrastructural facilities exist,..."

(E. U. ODIGBOH, Head, Agricultural Engineering Dept.,  
Faculty of Engineering, University of Nigeria)



SENEGAL

At the national level:

- "The setting up of an accessible maintenance facility for farmers is another decisive element of the promotion of rural mechanization and the production of machinery. Here, craftsmen and village mechanics could fulfill an important function as local branches of the central manufacturing plant.

As regards the supply of raw materials for the manufacturing process, there are great difficulties which impose a heavy constraint on the promotion of local manufacture. There are two possible complementary solutions to this:

- . maximum use of appropriate local raw materials
- . co-operation between several manufacturers by bulk purchases of raw materials through one manufacturer acting as a buying office for the other. One precondition for this, however, would be to unify and standardize the raw materials and certain spare parts used by the various manufacturers. A technology unit operated jointly by these manufacturers could take this in hand.

At the international level:

- "The promotion of the local manufacture of farming equipment in our countries is hampered by the virtual absence of horizontal south-south co-operation and by a notorious lack of up-to-date information on each country's experiences in various technological fields on the variety and special features of the equipment produced.

An attempt should be made to improve this situation by establishing a sub-regional technology unit with the assistance of FAO, ILO and especially UNIDO.

- In order to promote local manufacturing, increased international assistance is therefore more than necessary

- . for the promotion of national basic facilities in our countries;
- . by furthering trade and co-operation among existing production units as part of a coherent process of integration in which the problems of the market should be taken into account and which should lead to the establishment of viable regional industrial plants;
- . by providing facilities and opportunities at all levels for training in farm mechanization; by identifying sufficient sources of finance and export assistance in the various fields mentioned above."

(Birame Ngoye FALL, Director, SISCOMA/SISMAR,  
Dakar)

SUDAN

- "Except for a small part of hand-tool manufacturing produced at an artisan level by blacksmiths, Sudan is still importing all agricultural machinery and the great part of agricultural hand tools from abroad.

- Within the national policy towards small scale and basic engineering and metal-working industries, there is a bias against the agricultural machinery sector. A change of policy is needed to give priority to this sector concerning financing, appropriate technology adoption, training and also special concessions."

- It is advisable that ECA and UNIDO extend help in master-planning a programme for organization, financing and development of the engineering and metal-working industries in Sudan.

- On the sub-regional, regional and international co-operation, results are achieved in the field of agricultural production. More co-operation is needed in the field of agricultural machinery manufacturing. Joint investment projects including basic facilities are strongly recommended."

(Bashir M. MOHAMMEDANI, Director, Engineering  
and Technical Department, Ministry of Industry,  
Khartoum)

TANZANIA

Recommendations:

- "Establish modern agricultural machinery plants in well selected locations based on appropriate technologies. Establish or support rural craft work shops where hand tools such as hoes, sickles, billhooks, knives, etc. can be made at relatively low production costs. Establish new and support the existing engineering and basic metal-working industries for provision of necessary linkages to the agricultural machinery industry. Develop and improve the rural infrastructure for facilitating distribution of agricultural machinery and establishment of small-scale producing units. Establish and/or assist in establishment of storage facilities for both agricultural inputs and outputs in order to avoid frustration of the farmers' efforts. Offer incentives such as subsidies, low levies, high prices to the farmers' products. International organizations such as UNIDO should assist African countries in negotiation for procurement of agricultural machinery, equipment required for establishment of agricultural machinery manufacturing plants, transfer of technology within a specified time period after identification of suitable foreign companies/organizations...."

(T. C. HAULE, Ministry of Industries, P.O. Box 9503,  
Dar es Salaam; Mr. C. M. MBENA, National Development  
Corp., P.O. Box 2669, Dar es Salaam)

TOGO

The role of subregional, regional and international co-operation

- "An example of subregional co-operation may be seen in the CIMAO clinker plant, established with equity capital subscribed in equal amounts by the Ivory Coast, Ghana and Togo.

Togo has a major iron ore deposit in the northern part of the country. Studies are in progress to determine the feasibility of working this ore for the establishment in the near future of a basic iron-and-steel complex. Following this example of CIMAO, it is possible to envisage subregional co-operation between Togo, Upper Volta and Senegal in the extraction of the ore, in return for which Togo would provide the two latter countries with the raw material they require for their manufacture of agricultural equipment. Another possible form of co-operation would have the West African countries which produce agricultural implements specialize in the manufacture of specific equipment types, which they might then exchange on the basis of commercial agreements."

(Komlavi PEDANOU, Head of the Agricultural Division,  
Ministry for Rural Development, Lomé)

ZAIRE

At the national level

- "Recommend the metal-processing undertakings and the agricultural machinery undertakings to conclude subcontracts in order to secure a guarantee for both parties of the upgrading of local resources and the use of local raw materials. Forbid, therefore, imports of materials which are available from local resources and demand that the metal-processing undertakings concerned with signing subcontracts should increase output and improve the quality of their production in order to meet the technical requirements of the agricultural machinery undertakings.

- Give support and legal backing to "OPEZ" whose function is to persuade individual operators to form communal workshops and set up associations of local craftsmen and blacksmiths.

- With a view to agricultural mechanization, revive the activities of the pilot mechanization centres. Consider setting up in association with the centres and satellites engineering units for manufacturing spare parts for tractors and other agricultural machinery.

At sub-regional level

- "Evaluate all "CEPGL" tool and implements requirements for the decade in order to discover the level of the community's personnel production efforts and its import requirements. Recommend to the three member countries the adoption of a joint policy on local production of agricultural equipment and imports with a view to standardization."

(Ter-Asi-Me KALONGO SAKASAK, Head of Economic Studies, Department for Economic Studies and Industry, Kinshasa)

ZAMBIA

- "It is important to note that where two developing countries have established joint ventures, there is usually a third developed country supporting and financing such ventures. It is therefore necessary that for sub-regional co-operation to be established in Africa in the field of agricultural machinery industry, there may be a need for a developed "donor" country's involvement.

- The United Nations Industrial Development Organization should consider giving financial assistance and technical know-how to enable a group of African countries to set up industries and start producing (not assembling) more sophisticated agricultural machinery starting with small, simple tractors. There is great potential for sub-regional co-operation between Zambia, Zimbabwe, Tanzania and Malawi in the agricultural field.

- "In order to implement these recommendations it would be necessary to invest heavily in training of the personnel involved in the production of agricultural machinery to give them necessary skills for various lines of production. On-the-job training in well-established factories and formal engineering training in the agricultural machinery industry would be essential."

(Phillimon KAPESENELE, African Farming Equipment Ltd., Lusaka)

ANNEX 3

REPORT OF THE SIXTH CONFERENCE OF AFRICAN MINISTERS  
OF INDUSTRY \*

Short abstracts from Part two: Summary of  
Conclusions

B. Formulation and implementation of a Programme for Industrial  
Development Decade for Africa

Framework for the Preparation and Implementation of the Programme

(1980 - 1990) (ECA/IDD.1/INR/WP/1)

5. The Conference concluded that there should be two phases for the implementation of the Decade: the preparatory phase lasting from 1982 to about 1984 and an implementation phase covering the period 1985-1989. During the preparatory phase important aspects would include the elaboration of the Decade programme and its popularization not only at the level of the government but also throughout the entire community. Actions to be taken at the national, sub-regional, regional, interregional and international levels:

Actions at the national level

6. At the national level the Conference concluded that:

- (a) countries should undertake the preparation of an investment portfolio of identified core projects so as to facilitate the implementation of the Decade programme. While the identification of projects would largely be at the national level, there would also be a need to concurrently identify industrial projects requiring co-operation at the sub-regional and regional levels;  
....
- (e) a technology programme should be developed to include research and development, standardization and quality control, engineering design and technology adaptation, and strengthening of negotiating capabilities for the acquisition of foreign technology;  
.....
- (g) international co-operation should be promoted to include, in particular technical assistance from the UNDP, UNIDO the ECA as well as all other international organizations and greater financial assistance from international financial institutions to the industrial sector in Africa.

Action at the sub-regional and regional levels

7. The Conference concluded that:

- (a) industrial policies and programmes should be prepared within strategic industrial sub-sectors and areas at the sub-regional and regional levels for the purpose of promoting industrial complementarity based on specific resources endowment of each African country as well as joint and cross participation to optimize limited investment resources and to enlarge the markets;

\* Document ECA/CM.8/2. 2 December 1981.

- (b) in support of the recommendation of the seminar for "African Businessmen on the Development of Industrial Entrepreneurship in Africa" which was convened by the ECA from 9 - 14 November 1981 in Addis Ababa the OAU, ECA, UNDP, UNIDO, ILO, ITC and the relevant international organizations and member states are called upon to give the necessary support to the Bureau of the interim group established by the seminar to facilitate the formation of Regional Associations for African Manufacturers and Businessmen;
- (c) an information system should be set up which will promote the exchange of industrial and technological information among African countries with a view to enabling them to strengthen their bargaining positions and secure better terms for acquiring appropriate technology at reasonable cost;
- (d) this should be followed by the identification of multinational industrial projects of interest to the countries within the sub-region or region, leading to the promotion and creation of African Multinational Industrial Corporations between two or more countries;  
.....

Expected outputs during the preparatory phase

10. The Conference concluded that the result of the actions to be undertaken during the preparatory phase (1982-1984) of the Decade would as a minimum include:

- (a) the preparation of a coherent and internally consistent set of national, sub-regional and regional policies, master plans and programmes as well as designing and promoting an institutional machinery to achieve the objectives of the Decade in particular and the Lagos Plan of Action in general.

.....

Modalities for implementation.

11. The Conference concluded that:

- (a) a national coordinating committee and a focal point within the governmental administrative machinery should be set up, where these do not already exist, for coordinating the formulation, implementation and monitoring of the national programme for the Decade;
- (b) an intergovernmental machinery should be set up at the regional and sub-regional levels if this does not exist, for coordinating national actions and initiating and monitoring the implementation of regional and sub-regional activities and projects for the Decade; and
- (c) the OAU/ECA/UNIDO inter-secretariat committee for the Decade should intensify its efforts to carry out the task entrusted to it.

Guidelines for the Formulation of Strategies for Major Industrial Sub-sectors and Areas  
(1980 - 1990) ECA/IDD.1/INR/WP/2)

A. Major Priority Industrial Sub-sectors

Food processing industry

13. The Conference concluded that:

.....

- (b) food and agro-industry should be accorded high priority in terms of policies and resource allocation by member states and that efforts to industrialize should give priority to the manufacturing of agro-inputs and processing of agro-outputs, i.e. production and use of fertilizers, pesticides, agricultural machinery and equipment so as to produce more food.

Engineering industry

19. In view of the fact that the engineering industry is the carrier of technology, provides machinery and equipment to all economic and social activities, the Conference concluded that:

- (a) member states individually and collectively should undertake the manufacture of light and heavy industrial products such as engines, tractors, agricultural implements, trucks, buses, railway equipment, telecommunications equipment, textile machinery, food processing equipment, mining and mineral processing equipment and parts and components;
- (b) supporting engineering service facilities such as foundry, forging, machine shops, tool room, heat treatment, metal coating and fabrication facilities should be developed.

.....

Small scale industry

20. The Conference concluded that:

- (a) efforts should be made at the national level to develop small-scale industries in Africa, taking into account the existence of African Industrial Development Fund (AIDF).
- (b) more appropriate technologies should be utilized.

Monitoring and Reporting on the Implementation of the Programme for Industrial Development Decade for Africa (ECA/IDD.1/INR/WP/3)

24. The Conference concluded that:

- (a) the planning of the Decade programme should recognize the need of the regular monitoring and reporting on its implementation. Accordingly, the data that will be required for the evaluation of the progress of implementation should be collected on a regular basis and in particular before the commencement of the actual operation;
- (b) at the national level focal points should be established where they do not exist;
- .....
- (d) at the sub-regional level the existing institutions like the MULPOCs or other intergovernmental bodies should undertake the monitoring and reporting under the direction of the sub-regional technical committees;.....
- .....



