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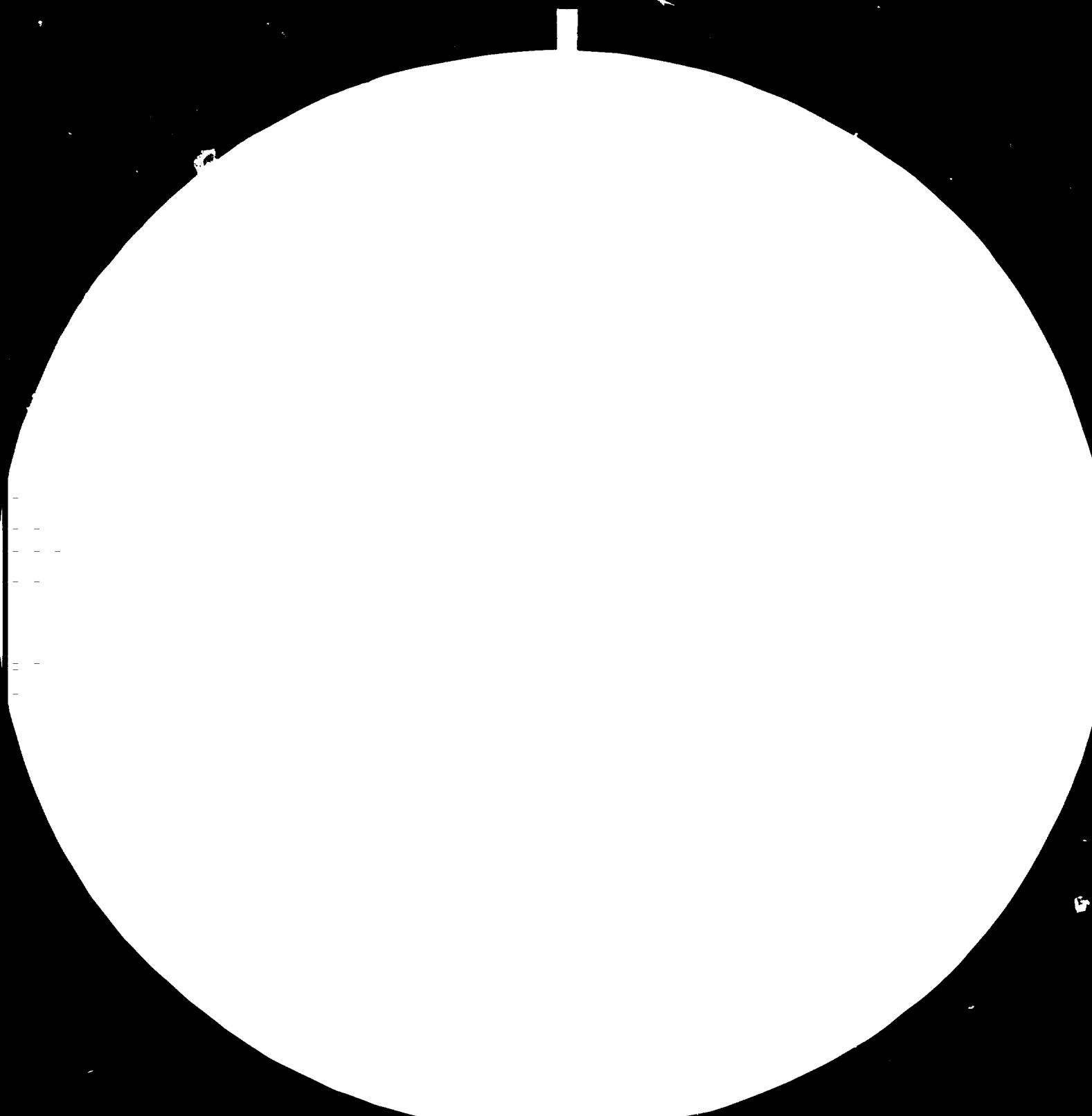
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CONSULTATION MEETING ON THE AGRICULTURAL
MACHINERY INDUSTRY

Regional assessment of issues on agricultural
machinery industry in some countries of West
and Central Africa.

March-April 1979

Report prepared for the Division of Policy
Co-ordination, Negotiation Section

by

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Industrial Development Organization

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This report has not been cleared with the
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nization which does not therefore necessarily
share the view presented.

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SUMMARY

Within the framework of the preparation for the Consultation Meeting on the Agricultural Machinery Industry and with regard to the issues discussed at preliminary Expert panels, UNIDO has carried out the missions of a group of consultants to assess in the field the reactions of the principal countries.

The report outlines the main arguments brought up by government officials, international experts, entrepreneurs, importers operating in the Agricultural Mechanization Sector during meetings and discussions in Zaire, Gabon, Central African Empire, Nigeria and Senegal.

The role of the agricultural machinery industry for each country and the assistance of UNIDO and other international agencies to overcome constraints and to promote mechanization development is spelled out as a regional assessment with individual outline for each country.

The appendix I summarizes regional and national approaches as debated during the first Conference of Agricultural Machinery Experts of the OCAM organization at Cotonou/Benin on March 5 to 10, 1979.

A listing of people interviewed and of supporting documents is contained on appendix II and III.

A. Regional Assessment

A.1. Introduction

The countries visited (Zaire, Gabon, Central African Empire, Nigeria, Senegal and the OCAM group) do not represent an omogenous entity in terms of political, economic, agricultural or industrial background. The degree of development and the infrastructures are at different stages and social and institutional environments are clearly differentiated.

There is however a nucleus of common problems with some exceptions for Senegal where the agricultural machinery industry is already established to some extent and where local metalworking skill has a long time tradition at village level. A basic consideration prevails throughout all contacts and discussions. Present agricultural output is considered insufficient for the national needs both as a major source of foreign currency and for feedstuff supply. Upgrading of rural living conditions and of farmers income is therefore fundamental to achieve two main objectives: increase of agricultural

production and stopping of rural exodus especially among younger generations. Agricultural mechanization follows then as a crucial step towards a steady development and to reduce critical dependency from food import. In many cases however there is not a precisely defined indication nor a detailed plan of action. The priorities and targets outlined in the national economical plans are therefore seldom achieved in full.

All parties met during the mission are convinced of the necessity of international and bilateral assistance in the field of agricultural mechanization to avoid further delays and to secure the effectiveness of the financial and human resources deployed for this objective.

The UNIDO consultation on the agricultural machinery industry is considered a very useful initiative in this direction.

A.2. Reactions to questions

A.2.1. Policy aspects

Agricultural development and mechanization are normally high ranking among the countries priorities. There is however a gap between the intention declared in the national plans and the real implementation, main reasons being indicated:

- a) lack of field experience on the appropriate mechanization level and consequently insufficiently defined policies.

Assistance in policy formulation/planning is considered useful in this respect but would be ineffective if not supported by relevant locally acquired research and development data on various levels of mechanization and on the variety of possible alternatives and local adaptations before attempting to determine the policy of the agricultural machinery industry and imports.

- b) A major constraint is almost always the scarcity of financial resources necessary to carry out a consistent programme articulated in different projects. The currency earn activities are insufficient and the existence of emergency situations (i.e. food or energy shortage) divert the resources to short term projects leaving behind medium/long term agricultural development programmes.

- c) Existence or infant stage of related infrastructures (transportation, fuel distribution, repair and spare parts system, farmer training facilities, fertilizers availability, rural energy network, irrigation schemes). This carries almost automatically a difficulty in the implementation of national policies and unsatisfactory return on the investments.
- d) Insufficient decentralisation. Too much activity and the decision making power are concentrated in the capital cities. As an opposite example Nigeria, being a federal republic, shows encouraging cases of agricultural mechanization policies defined and implemented at state level and apparently more adequate to local conditions.
- e) Lack of clearly spelled licensing and investment policies necessary to attract foreign capitals and expertise.

A.2.2. Technical aspects

As a direct consequence of the problems and constraints outlined for the policy aspects, the task of technical definition of appropriate technologies, tools and machinery has been indicated as mostly not sufficiently covered or, in some cases, there is no practical consequence with specific projects and programmes:

The single initiatives and manufacturing ventures are considered valid but generally not sufficient to lead the mechanization process towards appropriate levels if not integrated in the general framework of a national scheme.

Situation for the different categories of machines:

Category I - Hand tools, animal drawn machines and simple processing equipment. Mainly manufactured in Guinea and Senegal. Most of the requirements are covered by import, even from other African countries. Although vital for the development of village level mechanization and in spite of a basic agreement on the need to expand the production, significant efforts to improve the situation were never mentioned. International assistance and cooperation among developing countries should aim at promoting entrepreneurial skill in simple tools manufacturing and to exchange experiences. Main constraints are in some cases the lack of tradition on animal drawn

cultivation (Zaire, Gabon, partly Nigeria), difficulty to import metal and sub components because of financial restrictions, insufficient research and development.

Category II - Intermediate machinery

Similar situation as for category I with the additional constraint of the unavailability of locally produced castings, forgings and of adequate metal machining centers. Opinions vary on the consideration of this category as a necessary step towards the 3rd category. A few projects are being launched (Nigeria, Senegal) on individual basis by the private sector.

Category III - Powered machinery

Often considered as independent step from the previous ones. Some countries (Zaire, Nigeria, Senegal) have already active manufacturing/assembling facilities or plan to establish them.

In this category the major problems are considered:

- a) Necessity of in depth research and development activity on the selection, testing adaptation of various solutions offered by international manufacturers to the agricultural mechanization (small versus big machines, power tillers versus tractors, etc.).
- b) Technical difficulties like soil erosion, cultivation practices, etc. that would require integrated geological/agronomical/mechanization local investigations.
- c) Financing limitations involved in heavily capitalized industrial establishments like tractors assembly plants.
- d) Inadequate repair and spare parts coverage for the units imported and to a lesser degree for the one locally assembled. Unavailability of fuel for remote rural areas.
- e) Lack of basic metallurgical and metal working capacities.

This is an area of intensive request for international assistance. Regional cooperation (ex. OCEAN) is fundamental in view of the complexity and costs involved and on the limited size of the present markets (with the exception of Nigeria). Further studies on low cost tractor/power tiller are requested together with industrial feasibility studies and market research.

Category IV - Specialized machinery

Demand limited at present. No potential for manufacturing in sight. The import should be subject to previous testing and, if possible, to the adaptation to local conditions. Fundamental importance of proper operator training, repair and spare parts coverage. Financing support mostly welcome due to the high intensity of capital required by the import.

A.2.3. Institutional aspects

Institutions are reported operating at ministerial level to promote agricultural mechanization. There is however, in most cases a lack of coordination between the functions of planning, rural development, industry, small scale industry promotion and training-labour development and also in the private sector. The establishment of national agricultural mechanization centers, although planned in some countries or on regional basis (OCAM) is still to come and it appears to be the critical step toward specialized and coordinated mechanization. Examples of agricultural research institutes (Nigeria, Senegal) with locally developed technologies need to be supported and expanded.

National standardization committees, transfer of technology/licensing offices are claimed to be at an early stage of establishment and need international assistance in order to start their practical activity.

Rural finance policies need to be redesigned in some cases or to be started together with cooperative or farmer association schemes. The problem of chronically defective repair/maintenance spare parts coverage needs to be faced with efficient institutions aiming at

- a) Upgrading, expansion and modernization of training facilities and programmes especially for the lower levels of professionals (technicians and specialized workers, mechanics and operators).
- b) Establishment of networks of small-medium size workshops for the production of spare parts utilizing if available, existing establishments and artisanal skill.

- e) UNIDO assistance in directing industrial agricultural machinery manufacturers and partners in the developing countries to define "codes of conduct" in the after-sale assistance and in securing the manufacturing rights for some of the components or spare parts.

A.3. Recommendations

- a) After the consultation on agricultural machinery UNIDO should dedicate particular attention to the practical means of divalvation of the results among parties of the countries involved in the mechanisation process.
- b) The general recommendations, adopted as a basic philosophy should be discussed and reviewed with governmental officials, research institutions, entrepreneurs and experts of each individual country in view of designing the financial, institutional and technical facilities necessary for their implementation.
- c) UNIDO should promote an increased exchange of information in the field of the agricultural machinery industry expanding its influence and expertise to the areas of management, administration, raw material and component sourcing, licensing and technology transfer and training.
- d) UNIDO Agricultural mechanization projects should be coordinated with similar initiatives for the infrastructural system (transportation, power, product distribution, irrigation), with the purely agronomical/crop improvement programmes, and with manpower education and social development plans.
- e) UNIDO and other international agencies should encourage and promote arrangements and contacts between agricultural machinery manufacturers in the industrialized world and partners of the developing countries. The objective being to focus mechanization problems under a new light that takes into consideration long term mutual advantages rather than purely short term commercial consideration.
- f) The development of agricultural machinery industry in the area visited will create new problems connected with the long delays and scheduling procedures involved in the purchasing process of raw and semi finished materials from the industrialized world. The final result being unbearable

financial burden for advance payments and buffer safety works. UNIDO should pay attention to this aspect.

A.4. Conclusions

A.4.1. A general approval of the consultation concept and expectancy of its result as a new approach to the specific problems of the sector.

A.4.2. Specific investigations for each country would be required to tailor regional considerations to the local environment.

A.4.3. Cooperation with industrialized countries and with the agricultural machinery industry appears essential to overcome major constraints in the most economical and effective way.

A.4.4. Financing problems are often forbidding major projects. Priorities to long term credits for mechanization projects are indicated as one of the solutions.

PART B - STATEMENTS FROM INDIVIDUAL COUNTRIES

B.1) ZAIRE

B.1.1) Introduction

The vastity of the country, the scarcity of communications and infrastructures, the demographic pressure and above all the deficiency of raw materials and foreign currency constitute the main source of constraints for the agriculture, industry, mining and other activities.

The food shortage, balanced by massive imports drains critical financial resources from development projects especially in the agriculture.

International and bilateral assistances are active on several agricultural programmes apparently without uniformity of planning and with little efficiency.

B.1.2) Reactions to questions

b.1.2.1) Policy aspects

The Mobutu plan, the emergency plan (1979-81) and the forthcoming new five year plan (1982-1986) give absolute priority to agricultural development along two lines of action:

- a) highly mechanized agriculture with imported machinery for currency earning projects (palm-oil, cocoa, coffee).
- b) Food producing activities with locally produced or imported simple and intermediate implements to maximize labor occupation especially among young people.

The agricultural machinery industry is being promoted either through international/bilateral assistance to existing/new simple tools manufacturing units or through motorized machinery assembly plants. Major constraint is the unavailability of foreign currency for the raw materials/components required by the projects.

A liberal licensing policy is in effect but does not attract foreign manufacturers for the difficulties in the transfer of revenues.

B.1.2.2) Technical aspects

Identity of opinion on classification of agricultural machinery into four categories and on the necessity of local production for categories I and II. The priorities are for the upgrading of local production of category I and short term increase of import of more sophisticated machinery with medium-long term projects of local manufacturing. Technologies for category I and partly for II are readily available. Major constraints are the dependency from import for raw and semifinished materials and the present economical crisis that prevents realistic development projects.

B.1.2.3) Institutional aspects

Existing systems for R&D, repair and maintenance, training, financing, standardization, availability of spare parts are mostly ineffective and new projects delayed by the financial constraints.

Equipment life is drastically shortened and productivity reduced by the unavailability of spare parts. Local manufacture of spare parts theoretically feasible by existing plants is ineffective due to shortage of raw materials. Small scale industry promotion delayed by deficiency of tools import.

B.1.3) Recommendations

International assistance requested in the field of agricultural mechanization policy planning and implementation, R&D of agricultural equipment with industrial feasibility studies, including infrastructures and financial aspects.

Major fields of assistance are also the establishment of repair/maintenance networks, the local production of spare parts, the establishment of national standards for imported agricultural machinery, and the design of a technology transfer policy.

B.1.4) Conclusions

Area of critical importance for the agricultural machinery industry. In depth investigations seem necessary.

B.2) GABON

B.2.1) Introduction

Agriculture in Gabon influenced by the scarcity of the rural population (400,000 approx.) over an area of 267,000 sq.kms, mostly covered by forests, by the severe lack of communication infrastructures and by the emigration of young farmers towards the coastal cities (Libreville, Port Gentil).

The agricultural structure, apart from a few industrially established projects (palm-oil, coffee, cocoa) and from the forestry, is purely of subsistence nature and most of the food requirement is imported. Two projects with bilateral assistance in the South are aiming at rice production with hand tools (Chinese system) and with powered machinery (N'Dende program, Japanese system).

B.2.2) Reactions to questions

B.2.2.1) Policy aspects

The third five year plan (1976-80) as well as the fourth one (in preparation 1981-1985) give priority to agricultural development over two lines of action:

- a) Industrial plantations, intensively capitalized, as a source of foreign currencies, highly mechanized.
- b) Promotion of agricultural skill at village level with simple imported tools and/or creation of cooperative farms using imported intermediate machinery.

No animal drawn agriculture is planned due to lack of farmers tradition.

The reality is lagging behind plans and there are no projects for local production of tools and machinery, mainly because of the limited market, the high cost of labor and the unavailability of manpower.

B.2.2.2) Technical aspects

The classification of machinery and implements into four categories is considered correct. The priorities are for total import of all categories.

There is a need of basic work in formulating standards and for the R&D activity on most suitable equipment to the operating conditions.

B.2.2.3) Institutional aspects

Major constraints to the effectiveness of mechanization are repair and maintenance system, operator training and import/rural finance.

A simple/low cost tractor/power tiller could be suitable to back-up the project of cooperatives, but mainly if available for import. No local manufacture/assembly feasible.

Village based repair facilities and blacksmiths are declining due to rural exodus of the younger generations.

B.2.3) Recommendations

International assistance could be addressed to the establishment of a "Center for Agricultural and Forestry Machinery" to determine the most suitable equipment and its adaptations and to set standards for service and spare parts coverage.

Further assistance should be directed to a village workshop system for equipment maintenance and repair. Regional exchange of experience with countries of the area (Cameroun, Congo, Equatorial Guinea) should be promoted.

B.2.4) Conclusions

Short-medium terms development of agricultural machinery industry not foreseeable.

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B.3) CENTRAL AFRICAN EMPIRE

B.3.1) Introduction

A landlocked country, the C.A.E. is connected through lengthy river/road linkages with the other countries. Limited population density and low level of agricultural mechanization. Agricultural output includes mainly cotton and coffee as a source of foreign revenue and local food production.

Industrial structures practically non existing. Very limited repair facilities and mechanical shops concentrated exclusively in the capital city and operated by expatriates.

B.3.2) Reactions to questions

B.3.2.1) Policy aspects

The second five year plan (1976-1980) gives priority to agricultural development (and transportation) along following lines:

- a) strengthening and widening of existing animal drawn agriculture.
- b) "Bokassa plan" for rural motorized agriculture at village level.
- c) Industrial plantations (palm oil, coffee, cotton) with specialized machinery.

The reality has to face major constraints:

- d) insufficiently defined policy and implementation system.
 - e) Financial difficulties for new projects and for the survival of the existing ones.
 - f) Transportation problems for imported goods due to landlocked position.
 - g) Insufficient infrastructures (roads, service and parts facilities, fuel distribution system).
 - h) Lack of training of farmers and equipment users.
- Bilateral cooperation and international assistance are claimed to be "spotwise" without integrated efforts. No policy yet for agricultural machinery industry in sight. Some explanatory studies are being carried out on the possibility of establishing foundry/steel making plants to take advantage of existing minerals.

B.3.2.2) Technical aspects

The basic classification into four categories is considered as correct and with the agreement on the need to develop local manufacture of the first two categories. Simple tools are at present imported from Cameroon. More complex machinery from different sources, according to financing aspects and to commercial considerations.

There is a distinct requirement for simplified tractors/power tillers to reduce maintenance and increase life and on R&D activity to adapt imported machinery to local conditions.

Single successful mechanization project the OCCA cotton farming program, requiring financial support.

B.3.2.3) Institutional aspects

Critical the repair/maintenance situation due to shortage of qualified manpower, difficulties in obtaining spare parts, outdated workshops concentrated in Bangui only. The coordination of various activities/projects is insufficient.

Local artisan skill in metal working, blacksmiths not available. No standard institutions in sight.

B.3.3) Recommendations

International/bilateral cooperation could be addressed to:

- assist Ministry of Agriculture and Pesticides in formulating agricultural mechanization requirements and policies.
- Bring back in operation slowed-down experimental mechanization projects (Base Km 22 and similar).
- Strengthen U.C.C.A Cotton training Mechanization Project.
- Promote the institution of a national center for agricultural mechanization.
- Develop small spare parts production units and repair facilities.
- Establish village nucleus of artisanal facilities for simple tool manufacturing and repair.

B.3.4) Conclusions

Agricultural machinery industry not yet in the
planning stage.

Financing and training difficulties particularly
critical.

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B.4) NIGERIA

B.4.1) Introduction

The oil boom with its revenues has switched Nigerian main source of foreign currency income from agricultural products to oil export. As a consequence a consistent rural exodus and the growth of the cities have created the need for urban facilities, consumer goods, vehicles and industrial structures with consequent inflation.

Food is partly imported and there is now the necessity to stabilize and develop rural economy providing income for the farmers comparable to people employed in other sectors and to increase agricultural output. The problems of agricultural development are varying in the various states of the Nigerian Federation due to different ambient conditions and to the policies of each state.

B.4.2) Reactions to questions

B.4.2.1) Policy aspects

Present five year plan 1976-1980 gives priority to industrial development. The next one, 1980-1985 will probably put more emphasis on agriculture. No definite policy on agricultural mechanization appears to be emerging from the interviews at federal government level.

Mechanization with the extensive usage of tractors is being promoted for many projects of large scale state-controlled or private farms and for a tractor hiring service being implemented in the Central and Northern States. Contracts for tractors assembly plants have been signed with European manufacturers (Fiat, Steyr) and the related projects have partly been realized, others appear to be in the negotiation stage.

The vast majority of small farmers will not benefit from above projects and this is considered at federal government level with consequent plans for rural development schemes with cooperatives and extension centers.

Some examples of agriculture using animal drawn implements are being reported besides rice cultivation development programmes (chinese assistance). There is however, apparently insufficient coordination at Federal Government level, probably due to the general exceptionally high growth rate of the national economy and to insufficient centralized planning structures in the agricultural mechanization field.

B.4.2. Technical aspects

From the opinions of various officials as well as from the reports of specialized seminars (see appendix) it appears a clear trend towards the local manufacture of high horsepower motorized equipment especially tractors. The manufacture of hand tools, animal drawn implements or even power tillers are considered not feasible in the long range for the objective of keeping rural employment. However, several institutions such as the IITA at Ibadan and Agricultural faculties of some Nigerian Universities are working at Research and Development projects on appropriate low technology implements for private farmers with consequent small adequate scale production at village level. Hand tools production, adequate repair and maintenance structures are felt as a necessity by different officials but no clear indications appear for short medium term actions.

B.4.2.3. Institutional aspects

The most promising project appears the Federal Center for Agricultural Mechanization being developed with Rumanian assistance at Ilorin, Kwala State - The Center should coordinate state research activities on appropriate technology for agricultural mechanization and promote subsequent production of the implements developed or adapted at the center - start of activity scheduled for 1969. Training institutions on usage, maintenance, repair of agricultural equipment are theoretically sufficiently developed. It is felt however, that the results are not up to the expectations besides occasional examples of spontaneous private initiative.

B.4.3. Recommendations

International assistance is required at various levels of the Federal Government organization in the fields of definition and implementation of policies standardization, Research and Development coordination. State level assistance is also felt advisable due to variety of local constraints.

The fundamental aspects of repair/maintenance and the consequent need for skilled manpower and spare parts availability/local production are a very critical area, worth of deeper investigations. Training on the spot by international experts is felt as the most suitable form of assistance.

4.4. Conclusions

Due to the fundamental role of Nigeria as the most populated country of sub-Saharan Africa, in depth comprehensive studies of the Agricultural mechanization process are advisable.

B.5. SENEGAL

B.5.1. Introduction

Agriculture and related activities sufficiently well developed with fairly efficient infrastructures and institutional back-up. Traditional production of groundnuts being diversified with the expansion of rice and other foodstuff producing cultures. Major regional projects are in the process of evaluation for irrigation of vast territories through the construction of dams on the Senegal and Gambia River. Agricultural machinery industry already established at SISCOMA, a factory employing 500 people and partly government owned. Some of the implements are exported to Mali and other countries of the region.

B.5.2. Reactions to questions

B.5.2.1. Policy aspects

The fifth four year plan (1977-1981) assigns "higher" priority to culture and schooling system followed by agricultural development. Mechanization mostly limited to animal drawn implements with a limited number of motorized machinery especially for state owned farms. No defined policy in relation to imported machinery and tools, entirely controlled by the private sector. There are projects for the introduction of appropriate technologies machinery in the rice cultivation to be developed within the Senegal River programme, but no ultimate choice has been made yet. Future development of agricultural mechanization largely dependent upon government attitude toward credit to farmers and to financial resources made available for machinery acquisition.

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B.5.2.2. Technical Aspects

Implements of the category II are available for individual farmers through SISCOMA production, covering especially the field of animal drawn agricultural machinery, widely used throughout the country.

There is a project of tractor assembly with partial local production using SISCOMA facilities. Selection of appropriate machinery and technology not yet finalised. The size of the market appears however limited if not backed by a substantial export share.

B.5.2.3. Institutional Aspects

Institutional system is considered suitable for agricultural machinery research (ISRA, Institut sénégalais de Recherches agricoles), for farmers training (SODEVA, Société de développement et vulgarisation agricole), for financing of agricultural projects (ONCAD, Organisme national de crédit agricole) and for small scale Industry Promotion (SONEPI, Société nationale d'Etudes pour la Petite Industrie). The project for a Centre of Agricultural Mechanization to coordinate specific efforts in this field is an additional step in the correct direction.

B.5.3.3. Recommendations

International assistance appears useful in the field of company management and administration of SISCOMA and specifically in the critical field of raw material sourcing and purchasing.

The adoption of motorised agricultural machinery in a near future should be supported by an upgrading of the training system for mechanics in the field of repair and maintenance, with a specific assistance programme

B.5.4. Conclusions

Agricultural machinery situation relatively in line with UNIDO recommendations.

The implementation of water projects (ONV, etc.) will probably require the development of adequate local production facilities of tools and implements and of a service repair network.

APPENDIX I - The OCAM Countries

Reactions during the first conference of OCAM Experts on agricultural machinery and implements at Cotonou, March 5 to 10, 1979.

I.A. OCAM regional assessment

I.A.1 Policy aspects Necessity for increased exchange of information and co-ordination on agricultural machinery development among regional organizations and with the international agencies. Main emphasis should be on training programmes more than on international expert missions. Local governments should be more entrusted with the implementation of the projects leaving to international experts the assistance on the technical aspects of the projects.

Integration of projects among international agencies (UNIDO/FAO/ILO) and the elimination of duplications recommended.

Lack of background on project formulation from the individual developing countries: experience on project formulation should be widened to avoid projects designed by the foreign organizations only.

I.A.2. Technical aspects

Limits of transfer of technology. Need for self-development of adequate technologies on agricultural machinery taking into account practical experience of local farmers and soil, rain level, environmental and local skill conditions etc.

I.A.3. Assistance

Preliminary projects on route as a conclusion of the Conference for an interregional agricultural mechanization centre to be presented to meeting of OCAM Chiefs of State in June 1979. International assistance at various levels desired in the implementation of the project.

I.B. Remarks and experiences of individual countries

I.B.1. Niger

Slow development of animal-drawn agriculture due to lack of farmers tradition

Some projects of mechanization with imported power tillers being carried out in specific areas of the Niger valley. Critical situation of service and spare parts.

No local production available or planned for simple tools and implements.

I.B.2. Rwanda

Peculiar conditions of hilly terrains and very limited farming surface.

Animal-drawn agriculture not developed due to insufficient pastures. The creation of farmers co-operatives with government credits for the purchase of small agricultural machines appears one of the possible solutions.

I.B.3. Upper Volta

Basic policy to increase agricultural output and to switch to market agriculture by the association of agriculture to animal breeding. Animal-drawn system with slow introduction of mechanization following a project of rural workshops for equipment maintenance at village level carried out by FAO.

I.B.4. Togo

Some projects of animal-drawn cultivation and of government supported mechanized farms using imported tractors. Critical factors the service/spare parts coverage and the operators training.

Mauritius

Different ecological conditions. Mainly sugar cane fields heavily mechanized with imported specialized machinery. Efforts required in the development of adequate smaller motorized machinery for new cultivations.

I.B.6. Ivory Coast

Mechanization in advanced stage with different experiences of locally developed appropriate technologies. Local production already started.

I.B.7. Benin

No clearly defined mechanization policy. Different levels being developed with animal drawn cultivation and imported heavy machinery. Critical areas in the formulation of policies, operators training, choice of appropriate machinery and service/spare parts coverage.

I.B.8. Senegal

I.B.9. Central African Empire

} Separately handled

APPENDIX II: List of People interviewed

KINSHASA, ZAIRE

Mr. Ehrlich	UNDP Adjoint Resident Representative
Mr. Le Noble	UNIDO S.I.T.F.A.
Mr. Salah Niare	FAO Representative
Mr. Friedmann	UNIDO Expert c/o OPEZ, Organisation pour la petite et moyenne entreprise
Mr. Sperling	UNIDO Expert c/o OPEZ, Organisation pour la petite et moyenne entreprise
CIT. Kasele-la-Lobato	Directeur, chef de service de normalisation, Département de l'Economie nationale et de l'Industrie
CIT. Mayala	Chef de Division OPEZ, organisation pour la petite et moyenne entreprise
CIT. Nupitu	Directeur OPEZ, Organisation pour la petite et moyenne entreprise
CIT. Kamilongo	Chef de service petite Industrie, OPEZ, organisation pour la petite et moyenne entreprise
CIT. M. Lukusa	Chargé projets productifs et coopérations internationales, Département du plan - Direction des projets
CIT. -	Secrétaire d'Etat responsable des importations - Département de l'Economie nationale et de l'Industrie
CIT. Manka	Secrétaire ANEWA, Association nationale Entrepreneurs
CIT. Lurhala	Secrétaire d'Etat, Directeur Général de l'Agriculture - Département de l'Agriculture
Mr. J. Saucan	Directeur commercial - Commercial
Mr. Fez	Directeur administratif - Commercial
CIT. Moutonier	Propriétaire ACCUR
Dr. J.F. Conway	Groupe central technique - Church World Service Africa
Mr. T. Hanna	Product Engineer BORDING Tool Products
Mr. G.C. Roschelli	Directeur adjoint ICE, Office Italien pour le commerce extérieur

LIBREVILLE, GABON

Mr. Van Amerongen	FAO Project Manager, c/o Ministère de l'Agriculture, Service du Développement rural
Mr. R.R. Warolus	ILO Project Manager, c/o Ministère du Plan, Commissariat du Plan et du Développement
Mr. H. Mokaddem	UNIDO Expert - c/o Ministère du Plan, Commissariat du Plan et du Développement
Mr. J. Campaignolle	Conseiller technique - Ministère de l'Agriculture
Mr. J.F. Edjo'o	Chef de Division, Ministère du Plan, du Développement Rural et Forestier
Mr. E. Allogo	Ministère du Plan, chargé des relations avec les Nations Unies
Mr. R. Ondorebale	Ministère de l'Agriculture, Chef de Section du Machinisme agricole
Mr. D. Feroy	GANATEC, Département Hamelle, Afrique - Service commercial
Mr. T. Izumi	Nippon Koei LTD, Directeur administratif, projet rizicole N'DEIDE

BAHIAN, CENTRAL AMERICAN EMPIRE

Mr. A. Roekjaer	UNDP Resident Representative
Mr. Lugo Escobar	UNDP Adjoint Resident Representative
Mr. K. Tigoue	Directeur OCAM
Mr. Dr. C.P. Ramassalomy	Secrétaire OCAM
Mr. E.C. Hbedo	Directeur général, Ministère du Plan, de la Coopération internationale et de la Statistique
Mr. F. Datoloun	Bureau technique du Plan, Ministère du Plan de la Coopération internationale et de la Statistique
Mr. Bouchardy	Conseiller technique, coopération française au Ministère du Plan
Mr. E. Abdoul	Ministre de l'Agriculture
Mr. Himeziambi	Directeur général, Ministère de l'Agriculture
Mr. R. Dayo	Directeur du Bureau d'Etudes, Ministère de l'Agriculture
Mr. Igouanze	Ingénieur pédologique, Ministère de l'Agriculture
Mr. Fontaine	FAO, Expert c/o Ministère de l'Agriculture
Mr. Lalanderie	FAO, Expert c/o Ministère de l'Agriculture
Mr. Garaut	Chef de Service, Génie rural, Ministère de l'Agriculture
Mr. Soubia	Chef de Service, Statistique, Ministère de l'Agriculture
Mr. H. Korane	UNIDO Expert, Project CAN 71/005, Plans Scientifiques et Promotion industrielles, c/o Ministère du Commerce et de l'Industrie
Mr. F. Injovadi	Ministère du Commerce et de l'Industrie
Mr. J.R. Tourlinga	UNIDO Expert, Project CAN 72/001, Office de Promotion des P.M.E., Ministère des Travaux publics et du Territoire
Mr. Desras	Chef atelier mécanique général SONECAF
Mr. J. Gheti	Directeur général, Union cotonnière C.A. (UCCA)
Mr. Douai	Directeur technique, Union Cotonnière C.A. (UCCA)
Mr. Chalover	Responsable encadrement, Union Cotonnière C.A. (UCCA)

INDONESIA

Mr. A.B. Daskar	UNDP Assistant Resident Representative
Mr. V.C. Lavidon	UNDP Senior Industrial Field Adviser
Mr. V. Mikkelsen	UNDP Junior Professional Officer
Mr. Thompson	UNIDO Expert, Small Scale Industry Development Project
Mr. G.O. Enkora	Deputy Secretary, Ministry of Industries, Industrial Planning Division
Mr. R.S. Drysdale	Representative for West Africa, Ford Foundation
Mr. Ayo	Assistant Director (Agriculture) Agricultural Division of Central Planning Office, Federal Ministry of Economic Development
Mr. Van der Ende	FAO Expert, Horticultural Research Institute, Project NIG/7/2007
Mr. F.J. Okono	Director, Ministry of Industries, National Office for Industrial Property
Mr. A.E. Talabi	Principal Agricultural Engineer, Federal Department of Agriculture, Ministry of Agriculture, Water Resources and Rural Development
Mr. T.O. Abimbola	Agricultural Engineer, Federal Department of Agriculture, Ministry of Agriculture, Water Resources and Rural development
Mr. E. Amuh	Industrial Survey Section, Federal Office of Statistics
Mr. Osoio	Deputy Director, ILO Area Office
Mr. Chukwurah	Assistant Chief Plan Officer (Agriculture) Agricultural Division of Central Planning Office, Federal Ministry of Economic Development

DAKAR, SENEGAL

Mr. Coppini	PNUD, Deputy Representative
Mr. G. Ferrari	UNIDO SITFA
Ms. C. Halreys	UNIDO Assistant to SITFA
Mr. A. le Van Chau	UNIDO Expert c/o SOEPI, Société nationale Promotions et Etudes Petite Industrie
Mr. Ibrahim Ba	Directeurs Etudes, SOEPI, Société nationale, Promotions et Etudes, Petite Industrie
Mr. J.C. Dubruel	FAO, Resident Representative
Mr. Ton That Trinh	FAO, Conseiller technique c/o OMVS, Organisation mise en valeur de la vallée du Sénégal
M. Guignard	Conseiller technique, Ministère du développement industriel
M. Serre	Conseiller technique, Ministère du Plan et de la Coopération internationale
M. Schilling	Conseiller technique, Ministère de l'Agriculture, Division du développement rural
M. L. Banel	Chef du Service technico-commercial, Ets SOSEIF
M. Loirat	Directeur général, Ets. SOSEIF
M. Birame Ngaye-Fall	Directeur commercial SISCOMA
Mr. Youssouf Ba	Directeur Bureau Etudes SISCOMA

APPENDIX III - Documents and attachments

Zaire - Importazioni Zairesi macchine agricole (3/1979)

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