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Working Meeting On Co-operation
in the Field of Agro-Industries
Between Brazil and African Countries
Sao Paulo, Brazil, 6 to 10 November 1989

Organized by UNIDO and
Brazilian Government

TECHNICAL CO-OPERATION BETWEEN BRAZIL AND AFRICAN COUNTRIES IN THE AGRO-FOOD INDUSTRY

- National Paper -

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**/ Carlos Aquino - UNIDO Consultant has prepared this document. The Chapter 1 it is a summary of the contribuition prepared by Amilcar Baiardi - ABC Consultant

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SUMMARY

This document is the National Paper presented at the "Working Meeting on Co-operation in the Field of Agro-industries Between Brazil and African Countries" held in Sao Paulo, Brazil, 6 to 10 November 1989.

The present paper was prepared based opn data available at ABC - Brazilian Co-operation Agency and UNIDO - Brasilia; experience gained by Brazilian consulting engineering firms and private industries; and two assessments missions carried out during August and October 1989 in 10 African countries by two Brazilians consultants contracted by UNIDO.

The document is divided into four parts. Chapter 1 gives an historical overview of the development of the agro-industry in Brazil. Chapter 2 examines some details regarding the requirements for agro-industrial development in Africa, and identified demands in the sub-Saharan Africa (SSA). The Brazilian technological capacities available within the agro-indsutrial complex is listed. The Chapter 3 deals with the existing co-operation between Brazil/Africa in agro-industry and the institutional framework. Chapter 4 looks at some conclusions regarding co-operation Brazil/Africa.

Examining the problems and prospects in Africa, the following areas of action were highlighted for exercise on TCDC with Brazil in the field of Agro-industry:

- human resources development at all levels;
- R&D - Research and Development activities and technology transfer
- provision of equipment and assistance in setting up new agro-industries;
- rehabilitation of existing agro-industries specially in the five portuguese speaking countries;
- pre-investment activities (studies; Master Plan Development; Investment promotion meetings);
- technical assistance in the food industries ("trouble-shooting");
- studies and implementation of integrated agro-food industry system within rural development projects areas;
- assistance in food products quality promotion through participation with UNIDO in the regional approach of ARSO - African Regional Organizations for Standardization;
- documentation and assistance in developing an efficient system of regular iinformation flow.

As a consequence of the structural adjustment programmes, most of the African countries are attracting foreigner investment. Brazilian private enterprises are being considered as suitable partners for joint-ventures.

In spite of interest of both sides (Brazil/Africa) in the exercises on TCDC in agro-industry, the present stage of co-operation can be considered insufficient regarding the great potenctial to be expanded and strengthened.

The expectations is that the Working Meeting will become a landmark for the expansion and stregthening of technical co-operation planned between Brazil and African countries.

1. THE DEVELOPMENT OF THE AGRO-INDUSTRY IN BRAZIL

1.1. ECONOMIC EVOLUTION OF BRAZIL

Brazil presented several phases of development after its consolidation as an independent country.

The economic evolution of Brazil can be summarized in some chronological dates:

PERIOD	EVOLUTION REMARKS
1882 (Independency) to 1889 (Slaves abolition)	- economy based on coffee production for export; - slaves as labour force for food production (domestic market) and semi-industrial activities
1889 to 1929	- industrial growing of non metallic mineral; textile; leather; food; etc.; - urban development; - external economic dependence; - high fluctuations of "commodities" price generating wekness of the economy.
1929 to 1955	- Political revolution; - starts a new and better standard of industrial development; - new industries are created: steel; cement; chemicals; electrical goods; paper and products; rubber; etc. - limited industrialization due to lack of capital and technical background.

From 1955 - Begins the "heavy industrialization" period identified by:

- complementary block of investments;
- accelerated growing of productivity capacity in the sector of cappital goods and inputs production.

1.2. STRUCTURAL TRANSFORMATION AND DEVELOPMENT POLICIES IN AGRICULTURE AND AGRO-INDUSTRY

Structural transformation in the country from agricultural to industrial economy demanded half century, mainly through external influence which stimulates the domestic industrial production replacing the imports before and after the I World War.

The Table 1 reflects the evolution of GDP during the period of 1920 to 1950:

TABLE 1 - Destribution of GDP 1920 - 1980 BRAZIL

(per cent)

YEAR	AGRICULTURE	INDUSTRY
1920	40	10
1950	25	22
1969	18	30
1980	13	33

Source: IBGE

This agriculture reduction does not reflects decrease in performance but a significative growing of industry.

During the first half of the century the Brazilian agriculture had structural changes. In fact, up to 1920 its role was directed to export, self-consumption, and urban supply.

Agriculture had decisive incluence in the urban and industrial changes from the 30's, and this two process on the other hand had greatly influenced the modernization of the agriculture sector which industrialized and increased in productivity.

During the second half of the 60's the country reached a new agriculture pattern. The agriculture continued to thrive specially cereals and oilseed production. In 1989 the crop forecasted for the two was 71 million tons.

This transformations were due to coherent agricultural policy which burned the thesis on land tenure reform, and opted to modernize the agriculture in a conservative pattern which reflected the interest of the industry and the category of the land big ownership. This policy called by academics as "conservative modernization" had very defined objectives maintained up to 1985. The main objectives were attend to the demand of the national industry; facilitate the diversification of exports; to enlarge the domestic market for the large industry which produce inputs for agriculture; and to reduce the regional imbalances trough the modernization of the rural areas.

The "conservative modernization" had sectorial policies well defined, such as, land tenure; agricultural credit; technological development; transport and energy. The technological policy modified and stregthen the system of research and rural extension. The transport, storage, and energy policy, provided infra-structure needed for the expansion of the agriculture and livestock sector.

The most visible results of "conservative modernization" were:

- maintenance of land tenure concentration;
- reduction of rural population, i.e., rural migration;
- increase in the utilization of agricultural machines and modern inputs;
- grow of agriculture and agro-industrial production at a rate of 10 per cent a year.

Nowadays, Brazil has a reasonable agriculture size which generates surplus for both domestic and export markets determining the existence of a large and significative agro-industrial complex covering activities on production of input for the agriculture and livestock; the agriculture and livestock production; processing and packaging; and distribution.

During the analized period the agro-industry has received benefit with special programe covering feasibility studies, provision of subsidized financing, and other support. Moreover, certain sectors as alcohol production, cellulose, and cereal mills, received different treatment due to their strategical importance in the energy, food supply, and export policies.

1.3. AGRO-INDUSTRIAL COMPLEX DEVELOPMENT

Agro-industry defined as a rural industry for transformation of raw material does exist in Brazil since the beginning of the agriculture. However, its modernization started from the 50's when the industries of capital goods end basic inputs for agriculture were implanted.

The agro-industrial complex (CAI), has been established at the end of the 60's as a result of integration of inter--sectorial capital applied to the industries of basic input and capital goods for agriculture, and the agricultural industry for domestic and external market.

The transformation industry was strongly influenced by this modernization of the primary production sector. The following branches were those which followed more the modernization: animal feed; fruit juices; slaughterhouses; dairy; wood processing; cellulose; leather; tobacco; and alcohol. The high standards of products quality of those industries required a better technological profile of the agriculture production in terms of quality of raw materials among others.

From the second half of the 60's up to the 80's the industriaes within the agro-industrial complex increased their manufacturing value added (MVA) from 28.66 to 29.03 per cent.

The consolidation of CAI was not done in a uniform way so as consequence there are nowadays extremely dynamic agro-industrial centres and least developed one. As dynamic centres can be listed: Pelotas (RS), Caxias (RS); Concórdia (SC), Maringá (PR), Jundiaí (SP), Ribeirão Preto (SP), Uberaba (MG), Uberlândia (MG) e Juazeiro-Petrolina (PE-BA).

In the last three years, the Brazilian average exports earnings were US$ 30 billion, i.e., 10 per cent of GDP. Out of this 38 per cent or US$ 11.4 billion came from industries which processed raw materials of non-animal origin.

1.4. CAPITAL GOODS INDUSTRY

The establishement and grows of CAI from the last years of the 60's was only possible because at that time the country already had an industry of capital goods.

The accelerate growing of this industry started from 1955 when the MVA was 8.68 per cent. In 1980 this MVA became 28.2 per cent.

Regarding the industrial structure there is remarkable demand for goods ordered instead of serial goods. The biggest customer for good ordered was the Ferderal Government during the 70's ordering nearly 80 per cent of the total production for projects specially in the energy and transport programmes. On the other hand, the private enterprises bought more than 80 per cent of serial goods.

During the period 1980-1983 the sector of capital goods suffered from the economic recession showing high idle rate. However, since 1984 the sector overcame the problems and started to achieve good perfomance reaching between 1984-86 a rate of production over 12 per cent per year.

1.5. RESEARCH AND TECHNOLOGY IN THE AGRO-INDUSTRY

Brazil had invested relatively small amount of financial resources for the scientific and technological development. The aim for 1990 is to reach 2 per cent of the GDP and 3 per cent in the year 2000. During the last years the amount of applications were around 0.6 to 0.8 per cent of the GDP which means US$ 2.1 billion. The State share with more than 70 per cent of the total. In spite of this the brazilian capacity is considered very good.

Almost all basic research on agriculture is undertaken by schools of agronomy at public universities which has around 3.000 researchers-professors. Beside that there are approximetly 2,000 scientists distributed in several centrs under EMBRAPA - Empresa Brasileira de Pesquisa Agropecuária, and 4,000 scientists among R&D state enterprises and centres.
Out from 9,000 to 10,000 scientists in the field of agriculture science, probably 10 per cent, i.e., 1,000 are involved in raw materials processing.

In the private sector, mainly in the food industry, can be find nearly 300 scientist with M.S. or PhD background.

Regarding the level of equipments nationalization the sugar cane and oilseed processing plants are those with the highest index, and the soluble coffee branche has the lowest nationalized index.

2. THE POSSIBILITIES OF CO-OPERATION WITH AFRICAN COUNTRIES IN THE AGRO-INDUSTRIAL SECTOR

2.1. BRIEF CONSIDERATIONS

Somehow Brazil has built up a fund of exerience in the adaptation of imported technologies and, at the same timea, has developed its own technology in many fields of activity. Both experiences have been applied in less developed regions of the country, in a manner suitable faor utilization by developing countries.

This aspect of the present stage of development gives to Brazil a special position in terms of capacities for co-operation with countries in Latin America, Asia and Africa.

Nowadays, Brazil with its diversified climatic, soil, and socio-economical conditions probably has one of the largest stock of technology and experiences available for co-operation among developing countries.

2.2. THE BRAZILIAN CO-OPERATION AGENCY - ABC

The Brazilian international technical co-operation is growing signicantly after the creation of ABC - Brazilian Co-operation Agency in september 1987. The ABC became the instrument to centralize the co-operation actions within the Foreign Affairs Ministry.

The main objective of ABC is to find means in order to increase relations and prospects for technical co-operation and further economic and commercial ones.

The main objective of ABC is to find ways and means of promoting TCDC and to increase further relations and prospects in the economic and commercial areas.

2.3. REQUIREMENTS FOR AGRO-INDUSTRIAL DEVELOPMENT IN AFRICA

The countries of sub-Saharan Africa (SSA) had an economic performance (GDP) at an avaerage annual rate of 2.3 per cent during 1984-1987, which is lower than the region's population growth rate of 3.0 per cent. Besides, the real income of the average Africa is still 10 per cent lower than in 1970.

Evaluation of IDDA - Industrial Development Decade for Africa carried out during 1988 and 1989 in 20 African and donor countries, as well as in African and international development organizations, through the joint action of the United Nations Economic Comission for Africa (ECA), the Organization for African Unity (OAU), UNIDO and the United Nations Development Programme

(UNDP), recommended that greater attention should be devoted to the development of small-scale industries, agriculture and the informal rural and urban sectors in order to promote domestic markets.

In order to overcome these challenges, the evaluation team recommended increased technical co-operation among developing countries within Africa as well as outside the continent.

Out from twelve areas of activity highlighted for IDDA II the following would be pointed out:- the promotion of agro-based industries; the rehabilitation of private and public enterprises; developing the human resource capabilities in Afica's industrial sector by restructuring educational and training systens.

During the 9th Meeting of the Conference of African Ministers of Industry held at Harare, Zimbabwe, from 29 May to 1 June 1989, the Ministers adopted a number of resolutions which constituted the African Common Position on the Third General Conference of UNIDO. The followings resolutions have close relations to the scope of this paper: new concepts and approaches for co-operation in respect to indsutrial development; development and transfer of technology and development of human resourcers; economic and technical co-operation among developing countries

Having as a reference this background information and also experience in Africa of the UN system and the Brazilian Co-operation Agency the assumption is that there are some common point regarding requirements for agro-industrial development in SSA for the next decades, as follow:

- human resources and institutional development in order to support the industrialization process;
- whenever possible utilize local resources in regard to minimize problems of inportation and to the balance-of-payment crisis;
- priority on food production;
- search for integration of agro-based industries and other strategical sectors of the economy;
- rehabilitation of existing agro-industries;
- industrialization promotion through small-and-medium-scale industry due to the following advantages:

    - produce more efficiently at competitive cost for local markets which are relatively small and different from each other;
    - generate activities in both rural and urban areas;
    - less energy consumption;
    - less capital intensive technology;
    - less demand for sophisticated production and management technologies;
    - low investment per job created

- technical and economic co-operation among developing countries

2.4. IDENTIFIED DEMANDS

Based on Brazilian experience in Africa, through ABC, consulting enterprises, private industries; and two assessment missions carried out during August and October 1989 in 10 African countries 1,2/ by two Brazilians consultants contracted by UNIDO, the following areas of action were highlighted for the exercise on TCDC in the field of agro-indsutry:

- human resources development at all levels;
- R&D - Research and Development activities;
- provision o by

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- provision of equipments and assistance in setting up new agro-industries;
- rehabilitation of existing agro-industries specially in the five portuguese speaking countries;
- pre-investment activities (studies; Master Plan Development; Investment Promotion Seminars);
- technical assistance in the industries ("trouble-shooting")
- studies and implementation of integrated agro-food industry system within rural development projects areas;
- assistance in food products quality promotion through participation with UNIDO in the regional approach of ARSO - African Regional Organization for Standardization;
- documentation and assistance in developing and efficient system of regular information flow.

As a consequence of the structural adjustment programmes, most of the African countries are attracting foreigner investment. Brazilian private enterprises are being considered as suitable partners for joint-ventures.

1/ Aquino, C. Mission Report on agro-industry assessment in Africa - Angola, Mozambique, Guinea-Bissau, Senegal and Niger. 8 - 31 October 1989. UNIDO Distr. Limited

2/ Veiga, A. S. Mission to Africa - Zambia, Malawi, Zimbabwe, Lesotho, and Tanzania. August 1989. UNIDO Distr. Limited

2.5. BRAZILIAN CAPACITIES FOR CO-OPERATION IN AGRO-INDUSTRY

Nowadays, Brazil has well established technological capacities in order to attend the demand for co-operation from developing countries.

The Brazilian capacities are found within the so called agro-indsutrial complex, which covers industries which produces inputs for the agriculture and livestock; the agriculture and livestock production; processing and packaging (agro-based industries producing food and non food products); and distribution systems.

The information presented are those on technologies, expertise, and equipments available in Brazil in the area of small-and-medium-scale agro-food industries.

2.5.1. AVAILABLE TECHNOLOGIES

The annexe 1 contents list of Brazilian technologies in the agro-food industry sector to which there are capacities on consulting engineering; equipments, materials, implements, and other agricultural and industrial inputs; research and development; and human resources development.

2.5.2. CONSULTING ENGINEERING

In Brazil there are a number of qualified consulting engineering firms with experience in less developed areas of the country, as well as in African countries.

Moreover, has to be considered that consulting is a key element in the technical co-operation process for the decision makers, and for the integration among Industry/R&D Centres/Universities when carrying out studies and projects.

The co-operation offfered covers the following range of activities:

Pre-investment phase

- natural resources and industrial diagnosis;
- investment opportunity identification;
- pre-feasibility studies;
- evaluation report;
- investment decision advice.

Investment phase

- basic and detailed engineering;
- negotiations and contracts;
- construction and equipment commissioning;
- start-up and initial operation.

Operational phase

- follow-up and adjustment;
- "trouble-shooting"

Identification and contact with firms would be done through ABC - Brasilia (see address-annexe 2).

2.5.3. PRIVATE INDUSTRIES

Contacts with the capital good industries and the food processing industries, can be arranged respectively by ABIMAQ - Brazilian Association of Machines Industry and Equipments, and ABIA - Brazilian Association of Food Industries. Addresses in annexe 2.

2.5.4. R&D RESEARCH AND DEVELOPMENT

Brazil has a good number of reputable scientists and researchers distributed among several R&D insitutions and universities in the country.

With 50 per cent the south-east region has the highest concentration of institutions dealing with agro-based industries problems. The southern region has 20 per cent and the northeast, north and west shares 30 per cent.

The following is a list of some Brazilian R&D organizations suitable for the co-operation task with African countries:

- ITAL - Instituto de Tecnologia de Alimentos
  Campinas - Sao Paulo

Is the largest R&D organization in Latin America in the field of food science and technology, having experiences in African countries such as, Angola, Ivory Coast, Senegal and Tanzania.

Facilities available: specialized laboratories; a Food Packaging Technology Centre set up with support from UNIDO; and 10 pilot plants (fruit and vegetables; industrial fermentation processes; grain storage; refrigeration and conservation of

fruits and vegetables; flours and baking; beverages - fermented, distiled and non-alcoholic; dehydrated food; sea food and sea resources; meat and meat products; dairy products.

- EMBRAPA - Empresa Brasileira de Pesquisa Agropecuaria
  Headquarters: Brasilia - DF

It is a public enterprise under the Agriculture Ministry which coordinates the agriculture research in the country.

EMBRAPA has more than 50 center distributed in different regions of Brazil, working in a specialized way (dairy production center; tropical fruit and cassava center; and the like)

In respect to agro-food industry EMBRAPA has the CTAA - Centro Nacional de Pesquisa de Tecnologia Agroindustrial de Alimentos, Rio de Janeiro. CTAA has experience in West Africa transfering technology on thermoplastic extrusion of flours for industrial and nutritional use.

- CETEC - Fundação Centro Tecnologico de Minas Gerais
  Belo Horizonte - Minas Gerais

Technology available on small-scale milk pasteurization (1,000 liters per day) and meat processing.

- NUTEC - Fundação Núcleo de Tecnologia Industrial
Fortaleza - Ceará

Technology available on cashew processing (12t/day)

- Faculdade de Engenharia de Alimentoss
  UNICAMP
  Campinas - SP

Co-operation on equipment and process development

- CEPED - Centro dc Pesquisas e Desenvolvimento
  Camaçari - Bahia

Technology available: post-harvest technology and processing of tropical fruits and vegetables; small-scale cassava and palm oil processing.

- CENTREINAR - Centro Nacional de Treinamento em Armazenagem
  Viçosa - Minas Gerais

Technology available on grain storage.

In annexe 3 addresses are listed. Contact through ABC is suggested.

2.5.5 HUMAN RESOURCES DEVELOPMENT

In general terms the co-operation offered woult be distributed into four levels:

- management
- maintenance
- processing and quality control
- faculty and researchers

As far management courses is concern the best way is through the CEBRAE - Centro Brasileiro de Apoio à Pequena e Média Empresa. In fact, for the coming year CEBRAE and IDIL Mozambique are organizing a group training programme in Brazil for selected managers as part of the UNIDO Project MOZ/86/015 -"Rehabilitation of the small and madium size industries".

The experience of FDRH - Human Resources Development Foundation in Rio Grande do Sul State has to be considered.

The best reference for industrial maintenance staff are those courses offered by SENAI. This institution participates in the CNI (National Cofederation of Industry) sustem.

For engineers, laboratory and technicians is recommended training programmes at the recipient country. Methodology of UNIDO "In-plant group training programme" would also be considered, as well as adaptation off UPP - Utility Partnership Programme (World Bank).

For academic people, organizations listed in 2.5.4. are suitable also for training. For post-graduation courses besides University of Campinas (UNICAMP) other organization can also be considered such as: Agriculture School at Piracicaba, São Paulo; Rural University, Rio de Janeiro; Viçosa Federal University, Minas Gerais; Ceará Federal University; and Paraíba Federal University.

Co-operation agreements can be negotiated by ABC.

3. EXISTING CO-OPERATION BETWEEN BRAZIL/AFRICA IN AGRO-INDUSTRY AND INSTITUTIONAL FRAMEWORK

At present, the activities being carried out in Africa jointly by ABC and the UN system include:

- Angola: training rural workers management
  investment promoters training

- Mozambique: Nacala Project

- SADCC (Southern Africa Development Coordination Conference)
  Several projects related to energy

- RAF/86/041 (Regional Africa Project)
  Dissemination of scientific and technical information on agricultural and agro-industrial production.

Some projects are in preparatory phase in Angola, Mozambique, Cabo Verde, Gana, Guinae-Bissau, São Tomé-Príncipe and Ivory Coast.

Follow-up meeting on study tour and consulation missions to Brazil was heldin Dakar, Senegal (13-17 May 1989), in the contex of the Africa/Brazil/UNDP - South-South cooperation through action oriented TCDC activities.

The meeting was organized jointly by the UNDP/RBA and the ARCT - African Regional Centre for Technology, to finalize co-operation agreement between ARCT and three Brazilian Institutions, namely EMBRAPA, CENTREINAR, and ITAL.

The objective is to initiate a number of cooperative pilot projects on technological information systems and networking; R&D activities in post-harvest technologies of roots and tubers, cereals, and fruits and vegetables; and develop appropriate energy technology component activities as well as foster human resources development.

Since its creation ABC adopted a strategy in work jointly with international organizations, traditional donors and finacing institutions.

Besides the UN system the World Bank is one of the best potential partners with which Brazil could work together in some selected developing countries. Brazil has already created a Consultant Trust Fund at the Bank and joined the Africa Project Development Facility.

4. CONCLUSIONS

In order to promote reflections and discussions the fllowing conclusions are listed:

- according to the available information, there are great interest from African coutries in co-aperation with Brazil;

- due to its diversifild climatic, soil, and socio-economical conditions, Brazil has a "display" of technology, know-how, and human resources ready for technical co-operation with African countries;

- regarding the African Portuguese speaking coutries, Brazil presents comparative advantages in relation to co-operation due to language and cultural identity;

- in spite of interest of both sides (Brazil/Africa) in the exercise on TCDC in agro-industry, the present stage of co-operation can be considered insufficient regarding the great potential to be expanded and strengthened.

The organizers of this Working Meeting expect that the event will become a landmark for the expansion and strengthening of technical co-operation in agro-industry.

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ANNEXE 1

LIST OF BRAZILIAN TECHNOLOGICAL CAPACITIES IN THE AGRO-FOOD INDUSTRY FOR CO-OPERATION WITH DEVELOPING COUNTRIES */

I. AGRICULTURAL AND LIVESTOCK PRODUCTION

- Genetic material: seeds, semen. Genetic Engineering.
- Project and establishment of production systems
- Agricultural Machines and implements
- Other inputs for production: fertilizers, pesticides, etc.

II. POST HARVEST PHISIOLOGY/PACKAGING/TRANSPORT/STORAGE

- Post-harvest phisiology
- Equipments for harvesting and handling
- Cold stores rooms
- Equipments for distribution and marketing centres

III. PRODUCTS/PROCESSES/EQUIPMENTS

1. Fruits

- tropical juices and nectars
- pulps and concentrated juices
- canning
- jam and candies
- citros processing
- cashew processing
- coconut processing
- banana asseptic canning

2. Vegetables

- dehydrated products
- frozen
- canning
- tomato (concentrated, pulp, peeled, catchup)
- sauces

*/ This list does not contain all capacities

3. Roots and Tubers

- cassava (gari, starch)
- yam, sweet-potato, potatoes

4. Cereals

- Processing for flour: wheat, corn, sorghum, millet
- Biscuit, pasta
- Baking
- Pre-gelatinized flours
- Corn flour products
- Thermoplastic extrusion of flours
- Rice processing

5. Oilseed processing

- soybean (crude, oil, refined oil, bran, cake, margarine and mayonnaise)
- Palm oil
- Cotton seed

6. Animal feed

7. Sugar production

- Sugar cane production and processing
- Molasses processing (alcohol, fodder and bakers yeast)

8. Dairy industry

- Milk processing: pasteurized, sterilized, powder, condensated, evaporated, cream
- Butter, cheeses, yogurt
- Casein and caseinates
- Whey processing
- Buffalo milk processing

9. Meat processing

- Salughterhouses for cattle, calves, goat, sheep, pigs and poultry
- Storing chilling and freezing of meat
- Canning
- Filled and stuffed packaged products (sausages, salamis etc.), smoked products, salted products
- Meats extracts

10. Egg production and processing

- Sorting, packaging and storing of eggs
- Egg powder

11. Sea foods

- Fish products
  - Canning
  - Chilling and freezing
  - Salt and smoked products
  - Fish flour
- Algae

12. Spices

- Preparation and packing of spices (black pepper, cloves etc.) and spices mixtures

13. Stimulant beverages

- Cofee (processing and roasting; soluble cofee)
- Tea (preparation and packing tea)

14. Baby-food

- On fruits, vegetable and meat mixtures basis

15. Chocolate and confectic ary

- Cottage industry chocolate
- Several products: drops, caramels, chewing gums, bonbons

16. Soups

- dehydrated soups

17. Natural food additives

- Essential oil (citros and other)
- Urucum (colour)
- Stevia (sweetner)

18. Alcohol

- Alcohol production: sugar cane, cassava, sorghum

19. Bier

- Bier production

20. Wine and vinegar

- Production of grape wine
- Production of vinegar: wine, fruits and alcohol

21. Spirits

- Sugar cane aguardent ("cachaça")
- Production of whisky, brandy and other spirits

22. Non alcoholic beverages

- Soft drinks
- Mineral water

IV. PACKAGING MATERIAL

- Fresh products
- processed products (glass; metal cans, plastic, cartons)

V. QUALITY CONTROL

- Basic analytical instruments for quality control laboratories

VI. UTILITIES

- Boiler and steam lines
- Refrigeration systems
- Water treatment systems
- Waste disposal treatment
- Equipments for handling materials (lift trucks and pallets, power conveyors)
- Others

ANNEXE 2

TECHNICAL CO-OPERATION

AGENCIA BRASILEIRA DE COOPERAÇÃO - ABC
Brazilian Co-operation Agency

Anexo I - Ministério das Relações Exteriores - 8o andar
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(061) 211.6813/14
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Telefax.: (061) 223.7362
(061) 224.6360

ADRESS OF INDUSTRIAL ASSOCIATIONS

CONFEDERAÇÃO NACIONAL DA INDÚSTRIA - CNI
National Confederation of Industry

Av. Nilo Peçanha, 50 - 34o andar
20044 Rio de Janeiro - RJ
Brazil
Tel.: (021) 292.7766
Telex: 55 21.22634

Contact: Albano de Prado Franco - President

FEDERAÇÃO DAS INDÚSTRIAS DO ESTADO DE SÃO PAULO - FIESP
Sao Paulo State Federation of Industries

Av. Paulista, 1313 - 14o andar
01311 São Paulo - SP
Brazil
Tel.: (011) 251.3522
Telex: 55 11.22130

Contact: External Trade Department

ASSOCIAÇÃO BRASILEIRA DAS INDÚSTRIAS DA ALIMENTAÇÃO - ABIA
Brazilian Association of Food Industries

Av. Nove de Julho, 3452
01406 São Paulo - SP
Brazil
Tel.: (011) 881.0766
Telex: 55 11.25785

ASSOCIAÇÃO BRASILEIRA DA INDÚSTRIA DE MÁQUINAS E EQUIPAMENTOS
ABIMAQ
Brazilian Association of Industrial Machines and Equipments

Av. Jabaquara, 2925
04045 São Paulo - SP
Brazil
Tel.: (011) 579.5044
Telex: 55 11.21217
Telefax: (011) 579.3488

ANNEXE 3

ADDRESSES OF RESEARCH AND DEVELOPMENT (R&D) ORGANIZATIONS

ITAL - INSTITUTO DE TECNOLOGIA DE ALIMENTOS
Institute of Food Technology

Av. Brasil, 2880
13100 Campinas - SP
Brazil
Tel.: (0192) 41.5222
Telex: 19.1009

CTAA - CENTRO NACIONAL DE PESQUISA DE TECNOLOGIA AGROINDUSTRIAL DE ALIMENTOS
National Centre for Research in Agro-industrial technology of food

Av. das Americas, 29501
23020 Rio de Janeiro - RJ
Brazil
Tel.: (021) 310.1353
Telex: 21.33267

FUNDAÇÃO CENTRO TECNOLOGICO DE MINAS GERAIS - CETEC
Technological Centre Foundation of Minas Gerais State

Av. Jose Candido da Silveira, 2000
31170 Belo Horizonte - MG
Brazil
Tel.: (031) 461.7933
Telex: 31.1031

FUNDAÇÃO NUCLEO DE TECNOLOGIA INDUSTRIAL - NUTEC
Industrial Technology Centre Foundation

R. Monsenhor Otavio de Castro, 21
60050 Foraleza - CE
Brazil

FACULDADE DE ENGENHARIA DE ALIMENTOS
Universidade de Campinas - UNICAMP
School of Food Engineering

Caixa Postal 1170
13100 Campinas - SP
Brazil
Tel.: (0192) 39.1301
Telex: 55 19.1150

INSTITUTO DE PESQUISAS TECNOLÓGICAS - IPT
Technology Research Institute

Cidade Universitária
05508 São Paulo - SP
Brazil
Tel.: (011) 268.2211
Telex: 55 11.22831

Co-operation: fertilizers technology

CEPED - CENTRO DE PESQUISAS E DESENVOLVIMENTO
Research and Development Centre

Km 0 da BA-536
Caixa Postal 09
42800 Camaçari - BA
Brazil
Tel.: (071) 832.1111
Telex: 55 71.1593

CENTREINAR - CENTRO NACIONAL DE TREINAMENTO EM ARMAZENAGEM
National Centre for Training in Storage
Universidade Federal de Viçosa
Viçosa - Minas Gerais
Brazil