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AGRO-FOOD INDUSTRIAL SYSTEM

PRELIMINARY GUIDELINES ON THE NATURE OF GROUP-SPECIFIC TECHNICAL ASSISTANCE REQUIREMENTS

The agro-food industries can be defined as manufacturing industries that use as their principal raw materials vegetable or animal agricultural products, fishery products, or forestry products. About 80 industries of the United Nations classification, out of a total of 600 are agro-industries. Fifty other industries are activities derived from agro-industries (furniture manufacture, clothing, footwear, etc.). The main agro-industries are food, beverages and tobacco industry, the textile industry, wood and paper industry, the leather industry and the rubber (natural) industry.

A number of fundamental features are common to the agro-industries and these are of interest to the developing countries:

-The satisfaction of priority final consumption needs (food, clothing, housing);
-The use of technologies that make possible the preservation of perishable products, the reduction of losses between producer and consumer, the recovery of by-products, and the recycling of wastes;
-Utilization of agricultural raw materials that may permit an improvement in the incomes of the direct producers and some stability in prices for the consumer;
-Incentives to modernize agriculture through the development of "Take-off" industries in the economic growth process, which have indirect effects on the other industries;
-Capital requirements usually lower than those of other industrial sectors, and high co-efficient of labour intensity;
-Wide opportunities on the international market that are fairly rapidly accessible.

The agro-industrial system in Africa is very complex indeed. So many elements interact to inhibit the development of a modern agro-industrial system. These include:

a) Problems at the primary production level:

-Yields are low as production methods are primitive.
-Costs of production of primary raw materials are high.
-Marketable quantities are low and there are no surpluses for processing.
-The distance from the point of primary production to that of processing is far; this leads to high transportation costs and food losses.
-Infrastructures are inadequate and these cause logistical problems for agro-industry.

b) Planning is bedevilled by the lack of information:

Statistical data are unreliable and officials are sometimes reluctant to release data. Other problems include poor human resources, very small domestic markets, lack of capital, obsolete equipment and inconsistent Government policies which in some countries favour trading rather than manufacturing. Lack of foreign exchange has slowed down the agro-industrial development aspirations of many African countries.

There is no doubt that the level of foreign exchange has delayed the evolution of new agro-industries. In addition, current industries are suffering from lack of engineering maintenance capabilities: These industries are victims of poor investment decisions, inappropriate technologies and total lack of integration with other sectors of the industry. In fact, some African countries (Ghana, Nigeria and some North African countries) are going through the process of "de-industrialisation".

The situation is not totally hopeless. Given African countries' determination to be self-sufficient in food production and self-reliant in industrial development, industrial activities upstream and downstream of agriculture are of crucial significance. This is embodied in the Lagos Plan of Action and the proposed framework for the formulation of an operational programme of action has been set out in the document on Industrial Development Decade for Africa (1990/91).

Therefore, the work at the Project Development Support Unit (PDSU) of UNIDO is opportuned and timely. The work concentrates on the development and rehabilitation of agro-related industries in Africa. The work recognizes certain interdependent key requirements in agro-industrial development. In agro-food processing in particular, a balanced harmonious and integrated industrial structure from production through processing to marketing, and consumption is fully recognized, including policies (Government) which influence these developments. The constraints upon these developments are also noted.

Using the programme approach, practical techniques that permit the identification and formulation of packages of projects required for eliminating the bottlenecks and constraints inhibiting the development of a given industrial sector are applied. Work so far has identified thirty countries in Africa with good preconditions for rehabilitation in the agro-industrial sector. In providing preliminary guidelines as to the nature of group-specific technical assistance requirements, it is pertinent to examine the components used in this work and draw on the knowledge of specific agro-food processing industrial systems in Africa. The components are grouped as follows:

A. Production/Raw Material Supply Components
- -Agro-ecological constraints
- -Potential land resources
- -Investments to enhance land potential
- -Human resources
- -Land use
- -Crop protection
- -Livestock resources
- -livestock production

B. Processing Industry Components
- -Industrial infrastructure and manufacturing capacity
- -Size of processed food industry
- -Relative performance of manufacturing sector

C. Marketing/Consumption/Demand Components
- -Size of the domestic market for agro-processed products
- -External market (exports)
- -Economic structure

D. Policy

-Economic policy

The main constraints identified by component (see later) by country and by various processing lines and the extent to which these affect interlinkages in agro-food industrial development will influence the nature of technical assistance required for the development of individual subsystems. In promoting the application of the programme approach to project identification and formulation, group-specific patterns of development will focus on:

-Rehabilitation of existing facilities or replacements if needed
-Value added commodities for export
-New Industrialisation (small-, medium- or large-scale industries)

1. WHAT TYPE OF TECHNICAL ASSISTANCE?

In broad terms, technical assistance in agro-industrial processing can be in any of the following:

a) Training

-To improve mangement, production skills and structures and enhance labour productivity;
-In project planning, investment promotion;
-To develop an effective technological acquisition capability to regulate the flow of both capital equipment and technical know-how into the country;
-Quality control and testing;
-To strengthen bureau of standards, product development, research and development.

b) Information Systems Development

-To enable industrial and technological decisions to be taken on the basis of adequate information. Technial assistance is required in creating a data bank linked to UNIDO, FAO, etc.;
-Information systems analysts will gather, process and disseminate

data in order to provide a statistical basis for assessing the impact of sector specific policies and for modifying the policies when necessary.

c) Development of the engineering and machine tool industry

-This will lead to a broad based industrial structure, oriented towards the maintenance of existing industries. The production of spare parts and the development of technical manpower, necessary for the process of technological growth.

d) Investment

-Bilateral aid is becoming increasingly interested in small and medium scale enterprises, linked with the larger industrial units, as an indispensible stage in the creation of an industrial fabric. Technical assistance will be required in the preparation and execution of projects (feasibility studies, documentation, economic forecasting).

e) Policies

-Strengthen the forecasting capacity to formulate and implement appropriate policy measures.
-Identifying such enterprises which can significantly increase domestic resource use and channeling rehabilitation assistance to them;
-Providing resources for strengthening the institutional base for industrial master plans and policy making;
-Establishing an effective monitoring system for evaluating compliance by recipients of technical assistance to policy objectives and also evaluating the "delivery capacity" of industrial policy making institutions.

2. PRIORITY PROCESSING LINES

It is assumed that the following subsystems will be the outcome of the present exercise and these invariably will be the subjects of the mission.

-Meat and meat products
-Cereals
-Vegetable/edible oils and fats
-Sugar
-Cocoa and Coffee
-Tobacco
-Wood and wood products
-Fruits and vegetables
-Textiles
-Other beverages

3. PROJECT IDENTIFICATION

Specific subsystems are studied in greater detail, based on their components, linkages, inter-relationships and technical and economic constraints identified. Possible solutions will be the basis for technical assistance and/or investment projects. These should:

- -be cost-effective and can be managed and is related to the specific needs of the subsector;
- -produce the maximum positive impact on the development of the subsector and on the subsystem;
- -contribute to the integrated development of the agro-industrial subsector and the agro-industrial systems of which it is a part;
- -contribute to the elimination of bottlenecks and to the expansion of the system;
- -be located within the food-industrial institutional framework;
- -be compatible with other related ongoing projects and contribute to their successful implementation;
- -be feasible under the prevailing economic policies or should include recommendations for necessary policy changes.

4. METHODOLOGY

a) The structure of the agro-food industrial system is presented through a base diagram where the productive components of the production and consumption system and their linkages ar pictured. System flows (economic and physical) are given including stock variables such as installed capacities as well as performance indices such as the level of capacity utilization. The institutional framework (policies) are also included - the foregoing based on the MEPS users guide.

b) Basic qualitative and quantitative data that will allow the assessment of the relative importance of each component are obtained. Descriptive and qualitative base diagrams are drawn.

c) Data are obtained according to the particular characteristics of the system to help in defining the problem areas and identifying technical assistance and investment needs. Projects that have already been

identified are noted, and their compatibility with intended technical assistance projects assessed. The existing situation in the country, government policies and the institutional and technological setting are considered.

d) Government policies are discussed as they influence each component and in particular, the interests of Government as far as internal and external markets are concerned. Problems and bottlenecks that hinder the development of the system and restrict the attainment of Government's objectives can be identified from the base diagrams and in identifying projects to try to solve these problems. The projects should take into account the relationship of the agro-industrial system to the rest of the economy.

OPERATIONAL GUIDE TO DATA COLLECTION

An agro-industrial system proforma given below is required for the gathering of data. It is advised that a copy be sent to the counterparts in each country selected for the study before the consultant arrives there.

A. GENERAL PROFILE

1. Country
2. Government policies on agro-industry, industry, science and technology
3. Company name and address
4. Name and position of respondent
5. Plant site/location area
6. Ownership structure/equity participation (licence, transfer of know-how, joint venture, turnkey contract?)
7. Date production commenced:
8. Total number of full-time employees
9. Sector, percentage employed in labour force (manufacturing)

B. LEVEL OF DEVELOPMENT

1. Government policies on land use - adequate and consistent?
Raw material resources and supply

-type of raw material, sources (high yield varieties?)
-area and yields
-degree of mechanization (private, public, peasant farms)
-effect of agro-ecological conditions on yields
-gross value of production of raw material
-value added
-total production; productivity
-storage facilities (capacity)
-storage losses
-percentage consumed, percentage left (surplus) for processing
-percentage retained as reserves (e.g. grain reserves)
-commodity prices

2. Investments

-Total cost of irrigation, fertilizers, tractors, pesticides, afforestation;
-Post harvest storage costs (pest control, etc.)

C. PROCESSING

1. Name of firm, address, ownership, activities, employment, key officers, strengths, weaknesses, obstacles, marketing practices, etc.

2. Small-medium firms - geographic distribution, methods of operation market share.
Profiles of the firms as follows:
-Production technology employed
-Installed unit operations
-Brief description of production process and final product
-Number of enterprises involved (small, medium, large)
-Geographical distribution

-Input capacity (tons/annum)
-Actual capacity utilized (t/a)
-Utilization factor (%)
-Annual production record
-Ratio of product to raw material

3. Financial Data:

-Raw material costs, storage;
-Transportation costs;
-Packaging raw materials, sources, costs, storage;
-Investment costs/fixed capital;
-Foreign financing;
-Production costs;
-Economic profitability;
-Value added/fixed cost;
-Value added/gross value of production;
-Contribution to GDP;
-Performance ratios.

4. Maintenance

-Breakdown/repairs - frequency;
-Availability of machine shop and facilities (foundries, forges);
-Maintenance costs per year (spare parts, lubrication and greezing, etc.).

5. Energy consumption at full capacity (per year)

	Quantity	Average cost/unit	Total cost
Electricity			
Coal			
Petroleum			
Natural gas			
Water			
Steam			
Others (specify)			

6. Byproducts utilization

7. Product quality, availability of:
   -analytical laboratory (chemical, microbiology, effluent/waste treatment)
   -process/product development
   -research and development
   -research and development finance as a percentage of turnover
   -effluent/waste treatment plant
   -storage facilities
   -quarantine

8. Markets served

9. Productivity per manhour and per unit of capital

10. Manpower/human resources
   -Government policy on education, linkage between agro-industries and plans for education;
   -Number of technical schools relative to the arts;
   -Organisational structure;
   -Management (planning, finance, marketing, buying, personnel);
   -Technical (production)
      -maintenance crew
      -quality assurance
      -engineering
      -skilled craftsmen/technicians
      -unskilled
   -Relationship between production, engineering and quality control;
   -Training required to upgrade performance (industrial training);
   -Specialisation

11. Planned expansions and modernisations

   -Existing projects which are on line;
   -Existing project proposals;
   -Nature of expansion/modernisation;
   -Justification for expansion/modernisation;
   -Projected investment for expansion/modernisation and sources of finance;

-Suppliers and contractors for expansion/modernisation;

-Required equipment;

-Percentage local sourcing/content;

-Projected completion date;

12. What are the main problems? (technological shortenings or gaps)
What are the opportunities? (technology options for investment)
What policy recommendations?

D. MARKETING AND DISTRIBUTION

1. Domestic

a) Overview of the domestic marketing and distribution network.

b) What firms, addresses, ownership, activities, size, market share, employment.

c) What sort of technologies and marketing practices

d) Transportation:

i transportation costs as a percent of price

ii technology, methods of transport

iii origin/destination

-distribution centers and the locations they serve

-limiting factor(s)

e) Storage facilities:

i costs, reliability, etc.

ii pest control costs or cost of quality assurance

f) Packaging/preservation

i cans, fiber board cartons, plastic containers

ii fresh produce packaging

iii transportation hazards - product quantity at point of offloading goods

g) Price formation

-average per ton of product

2. International

a) Overview of the international marketing and distribution network

b) International marketing firms (large and small), marketing practices interviews with key officers, profiles of both large and small firms and geographic distribution

c) Transportation methods and costs

d) Storage facilties (warehousing)

   i costs, reliability

   ii location

   iii pest control costs or quality assurance costs

e) Ocean shipping facilities

f) Promotional activities

g) Preservation/packaging (as it affects distribution and marketing)

   i costs, effectiveness, methods and packaging technologies

   ii transportation hazards - product quality at point of offloading

   iii packaging quality, competitiveness with international marketing standards

h) Licences/fees/subsidies

i) Tariffs/export taxes

j) Impact of food aid programmes

k) Effectiveness of import/export controls

   i evasion

   ii inefficiencies

l) Exports/imports

   i flows measured in physical units and in US dollars

   ii unit values/prices by product and destination

   -FOB and CIF values for imports

   -transportation costs as per cent of FOB values

   -transportation costs by origin and destination

   -transportation costs by shipping method

   -level of foreign trade balance of the main products

m) Notes on obstacles to international market penetration

E DEMOGRAPHIC DATA

1. Population
   - -Urban
   - -Rural
   - -Regional
   - -Population growth rates

2. Employment
   - -labour force participation rates (male/female)
   - -employment by sector (agriculture, manufacturing, services, Government, others)

3. Income
   - -per capita incomes
   - -growth rates of per capita income

4. Food consumption habits by region (descriptive)
   - -Food consumption by region (quantitative);
   - -Food consumption by product types;
   - -Competition between domestic consumption requirements and industry (if any).

5. Family expenditure patterns by region and income
   - -Expenditure for food, housing, clothing, transportation, etc.;
   - -Methods of purchase, storage and preparation;
   - -Prices and preference for substitutes if prices are high.

6. Nutritional aspects
   - -Food budget: quantity and cost of various foods consumed;
   - -Per capita nutritional demand (calories, fat and protein);
   - -Per capita nutritional supply;
   - -FAO recommendations;
   - -Government objectives and policies on nutrition;
   - -Are these achieved?
   - -Seasonal fluctuations in nutritional conditions;
   - -Role of food foreign aid programmes in nutritional aspects.

It is important to gather as much data on costs and benefits in general, although concerted efforts will have to be made to get these from respondents. Adequate information is required to justify the recommendation of specific policies, technical assistance and investment promotion activities.

Mr. Omosaiye's report:

A I S C O N S T R A I N T S B Y C O U N T R Y

1. CAMEROON

a) Production
- -Sector greatly in need of modernisation and increased productivity
- -Production methods primitive, peesant farmers cultivate small areas with relatively low yields per hectare
- -Rural exodus has raised the average age of farmers to 47 years and of cocoa growers to 52 years
- -"Modern" sector is mainly in the hands of public or semi-public enterprises which are often inefficiently managed.
- -Poor rains in 1987/88 affected cotton output.
- -No protection; palm oil growers have been severely hit by cheap imports from the Far East.
- -Palm oil refining capacity inside the country falls far short of demand.
- -Mismanagement of price stabilisation funds at ONCPB, a body that administers marketing of crops and application of producer prices.
- -The forestry sector has not been able to meet domestic demand in full, high prices, poorly organised markets and the lack of influence of nationals in the sector.
- -Limited coastline (400 km) is a barrier to major expansion of industrial fish .

b) Manufacturing
- -Relatively little industry in Cameroon. The industrial sector has had a chequered history since independence.
- -Government's policy of import substitution under pressure from the IMF and World Bank.
- -Industrial Sector in need of structural reforms, e.g. the need to progressively open up to more competition.
- -State shareholdings in most of the major industrial and manufacturing ventures badly managed by Société Nationale d'Investissement (SNI) which holds these, leading to loss in profitability.

c) Food Industry Constraints:

- Poor roads limit the supply of raw and finished goods to industries and markets in the rural areas.
- Lack of enforcement of controls of quality; some industries have no facilities for QC.
- Raw materials costs are generally expensive whether produced locally or not, a major discincentive to food industry.
- Problems of overstaffing and poor performance are common in enterprises which are state-owned.
- Finished product prices are uncompetitive in the presence of cheap imported flour and therefore cannot be exported.
- Capacity utilization at flour mills (33 per cent); company records losses annually; low capacity utilization is common in food industry.
- Limited storage capacity is a major problem at the main flour mill.
- Problems with markets; imported finished products flood the local markets; products are priced higher than those of competitors.
- Problems with lack of spare parts arising from the absence of machinery and tool shops and absence of local competence to fabricate these.
- Costs of infrastructure - electricity, transport and water are rather high.
- There are no specialists to man high technology machinery and equipment, hence no maintencance know-how.
- Lack of specialization in the food industries subsectors generally.
- In tea processing, machinery and equipment are old and efficiency is low.
- Inappropriate technology or lack of expertise in technological choice at some enterprises.

d) Foreign Trade -An objective analysis is hampered by the lack of accurate data.

-Semi-processed goods are a major import category, reflecting the weakness of the domestic manufacturing sector.

e) Food Industries Cameroon

-Sugar processing
-Coffee
-Tea (tea sachets)
-Cocoa, chocolate, sweets and biscuits
-Palm oil - artisanal and industrial
-Groundnut oil mill
-Flour milling: wheat mills, rice mills, maize mills (in rural areas), pasta and macaroni
-Fruits and vegetables - processing very limited (pineapple juice); bananas for exportation only
-Meat processing - abattoirs in Yaounde and Douala.
-Dairy processing - (sweetened concentrated milk and yoghurt)
-Roots and tubers - VERY limited, artisanal
-Animal feeds
-Brewery and soft drinks

2. CONGO

a) Production

- Less than 1 per cent of the land is cultivated, yields are low, 55 per cent is covered by dense forest.
- Distribution and transport networks are poor.
- Sector has also suffered from rural-urban drift and
- Government's past policy of setting up state farms for the cultivation of both food and export crops, have proved inefficient and required large Government subsidies.
- Parastatal marketing monopolies are counterproductive.

b) Food Crops: Maize, Cassava, Groundnuts, Potatoes

- Congo relies heavily on imports to feed its swelling urban population, e.g. imports of wheat and rice.
- Marketing monopoly for several food crops by a State company was a disincentive to small peasant producers who carried two prices for their produce.

c) Export Crops: Coffee and Cocoa

- Agric products contribute very little to export earnings.
- Sugar production is low and well below installed capacities of processing (35 per cent).

d) Livestock

- Shortage of suitable pasture and the presence of tsetse fly are obstacles to the development of livestock rearing.

e) Fishing

- Fishing industry is still small.

f) Manufacturing

- Sector is small, state companies operating at a loss in recent years.
- The weakness of the transport infrastructure linking the North with the remainder of the country and particularly the coast.
- Management weakness and lack of technical support.
- Prospects uncertain due to fluctuations in the oil market; hence financial constraints.
- Small and medium sized enterprises are usually deprived of loans.
- The weakness of the domestic demand of 2.2 million inhabitants; thus the domestic market is far foo small to support the expansion of the manufacturing sector.
- Illegal imports; competition form neighbouring countries inhibit industrial expansion.

g) Food Industry Congo

- Sugar processing
- Fish processing
- Brewery and soft drinks
- Bakeries
- Palm oil milling; groundnut oil mills
- Cassava processing
- Flour milling
- Cassava processing

3. EGYPT

a) Production

- Agriculture has not kept pace with population growth leading to excessive import bills;
- 4 per cent of the land is arable;
- High soil salinity and drought in recent years;
- Agricultural land is lost to encroaching urbanisation under the pressure of population growth;
- Extensive state intervention is the primary factor responsible for agriculture's steep decline, e.g. Government's dictation of cultivation patterns, fixed producer prices and laid down controls on distribution and marketing failed to create adequate incentives for farmers;
- Certain inputs are often in short supply and credit is difficult to obtain;
- Agric labour in short supply; rural urban migration, high labour costs.

b) Manufacturing

- Sector suffers from considerable inefficiency;
- Returns on Investment (ROI) were low and despite considerable investment, the industrial sector was neither diversified nor efficient, and therefore was unable to compete in the international market place;
- Overstaffing and excessive Government protection form foreign competition;
- Productivity is low as well as plant utilization capacity, approximately 30 per cent capacity utilization in some cases.

c) Food Industries

- Sugar, white, refined;
- White cheese, dairy processing;
- Tomato pasta, canned;
- Fruits and vegetables; canned, dehydrated, solar dried, frozen, juice, jams, marmalade;
- Fish, canned;
- Mineral water;
- Cigarettes;
- Cotton seed oil, goundnut oil, other oils;

- Flour mills, macaroni, pasta;
- Meat and meat products;
- Baby foods;
- Rice mills;
- Animal feeds;

d) Foreign Trade

- A severe shortage of foreign exchange in 1985, combined with the pressure of debts incurred earlier created constraints resulting in a 20 per cent reduction in the volume of imports.
- With a population growth rate of about 2.7 per cent annually, steadily increasing imports of food products impose a heavy burden on the balance of payments.

4. SUDAN

a) Production

- Problems of desertification and variable precipitation;
- Prolonged and severe droughts in Sudan;
- Pressure on land, water and vegetation leading to a reduction in the fellow period followed by soil infertility and desertification;
- Drought and plant disease leading to a fall in the production of cotton;
- Depressed world cotton prices and unsatisfactory marketing policies left Sudan with substantial quantities of unsold stock of cotton;
- Enormous cost overruns to changes of management were part of the numerous setbacks to sugar production projects;
- Fluctuations in production of sorghum - 90 per cent of the crop is rainfed rather than irrigated;
- Changes in rainfall, yields and the area under cultivation leads to fluctuations in crop production generally;
- War at present hinders attempts to produce rice, tea and coffee in Southern Sudan.

b) Livestock

- Rinderpest outbreak led to a ban on Sudanese imports to the largest market - Saudi Arabia;
- Lack of transport facilities to carry livestock from Central and Western Savannah regions to Port Sudan is a further problem;
- A constraint on exports of cattle is their traditional use as mobile sources of wealth to pay dowries and provide prestige.

c) Fisheries

- One limitation on the fish catch is that fish reserves are located away from the major centres of population.

d) Manufacturing

- Sector remains relatively small;
- Sector faces severe shortage of trained manpower;
- Lack of raw materials and forex needed for importing essential intermediate inputs;
- Production costs have increased due to a series of devaluations of the Sudanese pound;
- Infrastructural bottlenecks;
- Low capacity utilization in sugar, textile, and food industries;
* Current emphasis is on rehabilitating existing manufacturing industries;
- Inadequacies in the road and rail system highlighted during the drought by the problems of food aid distribution form Port Sudan;
- In foreign trade, most agricultural exports fall back as a result of the drought and famine.

e) Food Industry

- Cotton
- Sugar refining
- Groundnuts, sesame; vegetable oil industry; 75 oil mills with a designed capacity of 911,700 tons all operating well below capacity;
- Gum arabic
- Durg (a variety of sorghum)
- Flour milling

- Canned fruits and vegetables, jam
- Dehydrated onions
- Milk products
- Cigarettes using domestic tobacco
- Brewing of beer (suspended)
- Soft drinks.

* Textile industry (25-30 per cent of sameplate capacity)

5. MOROCCO

a) Production

- Only 18 per cent of the total land area is arable.
- Four crops account for 82 per cent of cropland use - wheat, barley beans, and sugar beet.
- Land ownership patterns represent a major drag on agricultural output and productivity. The problem of inefficient smallholdings remain critical.

b) Agric output

- Since independence the growth of agric output has slowed and has not kept pace with growth in population. For example, domestic production of sugar now meets half of national needs, and imports of cereals to satisfy domestic demand since 1975.

c) Livestock

- Pasture is often thin and the quality of the herds poor.

d) Forestry

- Still underdeveloped.

e) Markets

Producer prices are controlled and there are subsidies to consumer prices for basic foodstuffs but agricultural wholesale and retail markets are not controlled.

f) Agric Outlook

The major problem facing the Moroccan agricultural sector is the restrictions imposed on exports by the EC in the wave of the Spanish and the Portuguese entry.

g) Manufacturing

Still a relatively small sector accounting for under 17 per cent of GDP in 1986, is mostly centred on the processing of export commodities and the production of consumer goods for the domestic market.

h) Transport and Communications

Has a relatively well developed transport system but the interior, the East and the South remain relatively isolated.

i) Foreign Trade

Despite Government attempts to control imports and stimulate exports in recent years, there has been a trend towards large trade deficits, with exports covering only slightly more than half the value of imports (64 per cent in 1986).

j) Exports

Agric exports form about 25 per cent of total exports, with citrus dominating the picture.

k) Agro-Industry

- An area of major investment taking 25 per cent of all investment and creating the most jobs;
- Fruit and vegetable canning for export based on:
  50,000 ha of vineyards - olives, vines, citrus, almonds and walnuts;
- Milling (Flour milling - wheat) flours processed from local grains
- Fish preserves for export
- Vegetable oils

- Sugar Production:
  - -Demand at 31 kg/head puts Moroccans as the world's largest consumers.
  - -Currently 13 sugar beet factories with an annual processing capacity well in excess of 400,000 tons of raw sugar and 3 cane works, and annual production capacity for raw sugar is 534,000 tons.
  - -Five major sugar refineries which together produced 665,377 tons in 1986.

1) Textiles

Subsector is expected to be at the forefront of export led industrial growth once a new association agreeement is signed with the E.C. in the wake of Spanish and Portuguese entry to the Community.

6. BURUNDI

a) Production

- Land is either owned privately by peasant farmers, 80 per cent of whom hold 1.5 ha or less.
- Yields are low, and statistics are sketchy for yields.
- Drought forced the Government to make an appeal for emergency food aid in 1984.

b) Food Crops

Cassava	Pulses
Bananas	Maize
Sweet potatoes	Sorghum

c) Cash Crops

Coffee, tea, cotton

- Cash crops coffee (predominantly arabica), cotton, and tea. Coffee accounted for 88 per cent of export receipts in 1986, however, export receipts are dangerously dependent on the climate and its impact on the coffee harvest.

d) Livestock

Not quite efficient.

e) Forestry

- Not managed on a commercial basis.
- Wood is extensively used for fuel, total land area covered by forest had fallen to 3 per cent by the early 1980's, since distribution of electricity outside the principal urban areas is extremely patchy.

f) Manufacturing

- Accounted for 5.3 per cent of GDP in 1986; is small and based almost entirely in the capital, Bujumbura.
- Brewing is the main activity in food processing.

g) Market*

- The market for manufactured goods is small in Burundi and limits its expansion;
- Fluctuating output trends due to:
    + an uneven supply of power
    + an acute shortage of foreign currency for the import of raw materials
    + the small domestic and regional market

h) Transport and Communications

Not enough roads; no railways; of the 5,162 km of roads available, only 310 km are all weather.

i) Food Processing

- Brewing is main activity;
- Sugar mill (daily capacity 1000 tons or approximately 90 per cent of domestic needs)

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* The need for production and equipment items cannot be met by domestic industry.

- Rice)
) projects to set up these initiated in 1983-87 plan
- Palm)
- Soft drinks
- Coffee Processing ??

j) Foreign Trade

Coffee will remain the principal export in the foreseeable future; tea and cotton have only limited potential for diversifying export goods.

7. ZAIRE

a) Production

- Sector has largely failed to live up to its potential.
- Food production per caput is estimated to be below pre-independence levels, while output of most of the main export crops is now lower than it was before independence.
- Vast timber resources also remain largely untapped.
- Poor agric performance due to shortcomings of Government policy.
- Logistical difficulty of organising the distribution of inputs and the marketing and processing of agric produce.
- Farmers had few skills to draw on following the abrupt departure of the Belgians during the crises which followed independence.
- Both food and cash crops have been hit by a combination of poor planning and unsuitable pricing policies.
- Reliable and consistent output figures are not available for food crops produced for subsistence (cassava, maize, rice, and plantain).
- Total starch and grain production would appear to have been insufficient to meet local demand.
- Transport difficulties have meant that demand in the urban areas has increasingly been met from imports.
- Coffee plantations are in urgent need of investment and the peasant farmers of training and credit. Zairean coffee (mostly robusta suited to roasting) is currently generating growing doubts about its quality from consumer nations.

b) Manufacturing

- The sector suffered from chronic mismanagement, rundown of stocks and weak financial controls.
- The sector is restricted in many ways, with market growing only slowly.
- Private Zairean capital is limited and funds tend to be chanelled into the quick turnover of commerce rather than the longer term investment that industry requires.
- Domestic market is too small to make a spare parts industry viable.
- Foreign exchange has historically been scarce.
- Low capacity utilization at most factories - 30 per cent.

c) Transport and Communications

- Transport has become the most quoted difficulty of industry and commerce; monsoon rains make many roads impassable for 3 months each year.
- Of the 140,000 km of roads, 2,450 were asphalted in 1985.

d) Foreign Trade

Percentage of agricultural exports has fallen since independence on account of a growing population and the exceedingly low level of investment in the sector; Coffee is the only agricultural export of importance.

e) Domestic AIS

-Cotton
-Palm oil
-Maize for brewing, milling and livestock feed.

-Food crops:	cassava	Cash crops:	plantation-grown coffee (Robusta)
	maize		oil palm
	rice		cocoa
	plantain		rubber and tea
			cotton and tobacco
			all produced on small holdings

-Sugar 63,928 tons
-Maize flour
-Animal feedstuffs
-Beer 4.28 m hl.
-Cigarettes 4.60 mn.
-Soft drinks 997,000 hl.

Textile Industries and Shoes

8. NIGERIA

a) Production

- Low productivity per unit of total resources employed in the production process.
- Low aggregate output of farm products since the producers rely on small holdings of 1-2 acres.
- A fixed land asset, declining potentiality of productive resources.
- Low capitalisation of farm production and irregular supply of farm inputs like fertilizers.
- Decline in agricultural investment since the first national development plan.
- Food production growth rate is much below the population growth rate and food demand.
- Estimated energy and protein supplies have been shown to be inadequate even up to 1990, which means that domestic supply/demand deficits will exist.
- Foreign exchange constraints on imports of agricultural commodities have recently begun to be reflected in increased crop production.
- Cocoa has suffered from low prices, the drift of labour to the cities, insufficient replanting and shortages of imports of fungicides, resulting in the spread of black pod disease; causing a large drop in output.
- The sudden switch to a free market led to a worrying drop in quality control.
- Domestic demand for sugar far outstrips supply.

* Import restrictions have affected the breweries and soft drinks manufacturers, flour millers and bakeries, textile mills and vegetable oil producers.

- Budgetary constraints are limiting the resources available for agricultural investment by the Government.
- Farming rights to traditionally held land take a long time to acquire, as compensation disputes often take years to resolve.
- Many of the initial agricultural investment schemes undertaken by industrial companies have failed due to poor project conception and inexperience in agriculture.
- The investment costs of local commercial production of industrial raw materials are inevitably high, and there is a need for much greater technology transfer than Nigeria has so far achieved.

b) Fish

- Production has been hampered by shortages of nets, boats and the cancellation of industrial fishing licences.

c) Manufacturing

- Static technology
- The development of local substitutes for many raw materials still requires heavy importation of processing equipment.
- By the beginning of 1987, capacity utilization was estimated to have fallen to an average of less than 30 per cent.
- Shrinking of the country's foreign exchange earnings was the root cause of the collapse in recent years; given Nigerian industry's acute dependence on imported raw materials and equipment. An estimated 60 per cent of all raw materials used by local industry are imported.
- Devaluation of the Naira dramatically increased their import costs, driving up unit production costs, which were high already because of low capacity utilization, poor infrastructure (most companies have to maintain their own generators).
- Industry has been hit by the severity of the restrictive monetary policies introduced under SAP to choke off excess demand and many small- to medium-aged companies have already been liquidated.
- The combined result of credit restrictions and the fall in real wages has been a slump in effective demand.

- Problems of achieving local sourcing are daunting:
    - ++ Many companies lack the necessary economies of scale to warrant the ventures being undertaken.
    - ++ Technical demands are also difficult and in most cases, there is still inadequate research into Nigerian substitutes.
    - ++ Heavy production costs also tend to make locally sourced materials more expensive than imported counterparts.

9. TOGO

a) Production

- The vagaries of the climate are the most important constraint on agricultural production.
- \+ Cash crop sector has long been affected by inadequate financial incentives.
- Producer prices are severely constrained by the low world prices for coffee and cocoa and the strength of the CFA franc.
- \+ Production of livestock is insufficient to meet domestic needs.
- Fish production is restricted by a lack of port and shore facilities; fishing remains relatively unimportant.

b) Manufacturing

- Sector is small, accounted for only 7 per cent of GDP in 1986.
- High energy consumption meant high production costs and recession dampened demand, resulting in the closure of many factories.

c) Foreign Trade

- Smuggling represents a significant volume of unrecorded trade, estimated to account for more than 10 per cent of total exports, and makes nonsense of published trade figures.

T O G O

Food Crops	Cash Crops
Yams	Karité (sheanut)
Cassava	Cocoa
Millet and Sorghum	Coffee
Maize	Cotton (seed)
Rice	Palm Kernels
	Groundnuts (shelled)

Processing

-Palm oil milling
-Coffee roasting
-Cotton ginning
-Textiles)
-Footwear)
-Beverages) Import substitution of consumer goods
-Confectionary)

10. IVORY COAST

a)

- Forestry resources have been greatly depleted and timber exports have been falling.
- Because cocoa is easier to grow and less heavily taxed, coffee output has been declining in recent years.
- Producer prices of cocoa have declined substantially in real terms since the late 1970s.
- For coffee, production has also slumped (drought, bush fires, aging of coffee bush).
- Quality of coffee is Government's major concern because farmers have abandoned proper harvesting and drying techniques.
- Sales of bananas and pineapples have dwindled rapidly in the last two years owing to deteriorating quality.
- World prices of sugar have been low in recent years and the crop faced serious difficulties.

b) Livestock

Relatively small livestock herds, largely due to the topographical limitation of extensive forest cover in the southern regions.

c) Forestry

Depleted resources because of the high rate of felling, the encroachment of agriculture on forest areas and inadequate re-afforestation.

d) Fishing

Industrial fishing is largely dominated by foreigners.

IVORY COAST

Food Crops	Cash Crops
Cassava	Coffee (world's 5th largest producer)
Yams	Cocoa (world's largest producer in 1977/78, provides 1/3 of world cocoa supplies)
Sweet potatoes	
Maize	
Millet	
Sorghum	
Rice (paddy)	Export Market
Plantains	
Fonio	Palm oil
	Cotton (seed)
	Pineapples
	Sugar (raw)
	Bananas
	Rubber
	Tobacco
	Coffee
	Cocoa
	Timber

Cotton ginnery: The country has 8 cotton ginneries with a total capacity of about 245,000 tons.

Flour milling
Food canning, processing
Drinks
Edible fats
Other foods, tobacco
Cocoa processing
Cotton processing

11. MALI

a) Production

- Almost all Malian agriculture is peasant farming with a very low level of technological development and use of purchased inputs such as fertilizers and pesticides.
- There is no market in agricultural land in Mali, land allocation still being conducted according to traditional methods.
- Pressure on land may be acting to reduce fallowing periods in some areas, thus contributing to ecological problems.
- Agricultural credit is hard to come by and the peasant farmers have had to struggle against both an unkind climate and a state marketing system designed to tax farmers (by paying below market prices) to the benefit of urban consumers.
- Small farmers have frequently been forced to sell their entire crop without keeping back anything for food or seed in order to repay equipment loans, agricultural services or taxes.

b) Livestock

Principal economic activity in the northern regions of Mali, it is the country's second most important recorded export. Grazing is seriously affected by poor rains and this results in the lowering of cattle population.

c) Forestry

Vast majority of the population, both rural and urban, is totally dependent on wood; there is poor regulation of the rate of use of firewood. Areas around the large population centres are being steadily stripped of trees, adding to existing environmental problems.

d) Manufacturing

- Accounted for only 7 per cent of GDP in 1985, the sector has been characterised by a dominance of STATE-OWNED ENTERPRISES, a legacy of the era of "Malian Socialism". Losses have been imposed on the Government budget.

- Food processing enterprises have suffered badly from lack of raw materials and most cperate at well below capacity.

e) Transport and Communications

Generally very poor, given a large land area and a scattered population, with most roads untarred and many impassable in the wet season. The country's landlocked situation is a major handicap.

f) Food Processing

-Three oil seed plants
-Two sugar refineries
-Fruit and vegetable canning plant
-Modern abattoir and tannery
-Beer and soft drinks plants
-Flour milling and baking plants
-Sheanut processing plant

* Transformation of cotton, and textile and clothing production (two main textile enterprises).

g) Foreign Trade

- An estimated half of the foreign trade with neighbouring countries goes unrecorded, but the figures show persistently large merchandise trade deficits.
- Exports are dominated by cotton, cotton products and by livestock, and have been depressed by drought and by failures of agricultural policy.

12. SENEGAL

a)

- The rural sector, including agriculture, livestock, forestry and fishing accounts for about 25 per cent of GDP, but supports approximately 75 per cent of the economically active population of the country.
- Output has not, on average, kept pace with population growth and has fluctuated very widely from year to year and this has consequently been central to the general difficulties faced by the economy and society, i.e. there is extreme sensitivity of output to the weather.
- Most of Senegal falls within the Sahelian zone, with irregular and uncertain rainfall and general poor soils.
- Farmland is almost all held under customary tenure arrangements guaranteed under the Loi sur la Domaine Nationale and is cultivated on a rotational system.
- With quite serious overcrowding in some areas, there is reduction in fallow-periods leading to lower soil fertility.
- The phasing out of the fertilizer subsidy from 1986 onwards and the cutting off of credit thus has potentially serious implications for production.
- Cultivation methods are generally primitive; holdings are small and farm incomes low.
- Large-scale industrial agriculture has so far been very limited.

b) Livestock

Population affected by drought, the country is a net importer of meat.

c) Fishing

Contributed only 2 per cent (estimated) to GDP in 1987, excluding first processing.

- The policing of the country's territorial waters to prevent illegal fishing by foreign vessels is a continuing problem.
- Published statistics on the fish catch are generally sparse and unreliable.

d) Forestry

Provides fuel for much of the rural sector; therefore tree cover has been seriously depleted over much of the land area to the point where soil stability and possibly the climate have been adversely affected.

e) Manufacturing

- Accounted for 19 per cent of GDP in 1987.
- Government hs significant or controlling interests in a large number of key enterprises; light industry is predominantly privately-owned, and in common with a number of the major industrial facilities, heavily reliant on foreign capital and management.
- Overall level of industrial activity is heavily affected by agricultural performance: oilseed processing alone carries a 12 per cent weighting in the index of industrial production; have however operated at a fraction of capacity and insufficient integration with other parts of the economy.

f) Transport and Communication

- Are generally poor, about 25 per cent of classified roads are ta.....

g) Foreign Trade

- Despite the Government's best efforts to boost exports and restrain imports, Senegal's external trade balance has remained in stubborn and deep deficit throughout th 1980's, with exports sometimes covering less than half the import bill.

- Disappointing performance due mainly to the effects of drought on trade in agricultural products (reducing groundnut product exports and increasing food import seeds and to adverse commodity price and currency movements).
- Picture is complicated by a large unrecorded trade accross the border.
- Generally, there is a continued lack of export diversification.

h) Agro-Industry

* Groundnut processing/oilseed processing is the most important.
  -Groundnut production = 40 per cent cultivated land, providing employment for as many as one million people.
  -Four crushing mills with a total capacity of 920,000 t.
  -Sharp fluctuations in groundnut production in the last 25 years have posed a severe problem for the economy, putting greater strain on Government resources.
* Cotton ginning: 4 plants
  Cotton spinning mill: 3 plants
  Weaving plants: 3 plants
  Fabric printing: 2 plants
* Fish processing
* Various foods (fruits and vegetables, mangos, tomatoes and pineapples)
* Sugar and confectionery
* Beer and Soft Drinks
* Textiles
* Clothing and leather
* Forestry and wood
* Paper and board

i) Food Crops

Grain - sorghum, millet and rice.

13. ZIMBABWE

a) Production

- The land tenure and resettlement has always been a central and controversial focus of attention in Zimbabwean history.
- Yields are mainly a function of rainfall and irrigation.
- An over-emphasis on maize at the expense of more drought resistant crops such as sorghum and millet aggravated the food problem in recent droughts.

b) Forestry

Wood is the main source of fuel in the communal areas and depletion of natural forest is a matter of increasing concern.

c) Manufacturing

* Zimbabwe has one of the largest, most diversified and best integrated manufacturing sectors in sub-Saharan Africa.
- The uncertain economic performance since the early 1980s means that many industries have been working at well below capacity, although the average is probably close to 60-70 per cent.
- A shortage of supervisors is said to be the main constraint on the more widespread adaption of shift working practised in some industries.

* The largest single company is Delta Breweries, previously controlled by South African Breweries.

d) Transport and Communications

- Zimbabwe is a landlocked country, and must route its overseas traffic through other countries. Cost is considerable.
- In 1987, lack of spare parts forced the Natural Railways of Zimbabwe (NRZ) to hire locomotives from South Africa.

e) Direction of Trade

Zimbabwe has still not regained the share of the Zambian and Malawian markets which was lost after World War I, while South Africa's position as dominant trade partner, though diminished, remains an important constraint on sanctions against it.

ZIMBABWE

Food Crops	Cash Crops
Maize - the main staple	Maize
Winter wheat	Meat
Coffee	Tobacco
Milk	Cotton
Cattle	Sugar
Sheep	Citrus Fruit
Pigs	Coffee
Sorghum	Groundnuts
Soyabeans	Sunflower
	Palm oil

Main Commodities Traded:

Agricultural	Manufactured
Tobacco	Textiles and clothing
Cotton	
Coffee	
Sugar	
Meat	
Tea	

14. MALAWI

a)

- Agriculture: most important sector of Malawi's economy
  - " contributes about 1/3 of GDP
  - " over 90 per cent of export earnings
  - " employs over half of those in paid employment
  - " supports at least 85 per cent of the population
- Sector critically affected by the incidence of rainfall.
- World market conditions and transport are key bottlenecks to agricultural exports.
- Foreign exchange controls have sharply increased the volume of exports in fish since 1980.
- There has been a drop in per capita fish consumption from 17.9 kg/head in 1972 to about 10.6 kg in 1987.

b) Energy

The sector has been characterised by severe supply problems with petroleum products, fuelwood and coal all badly affected in recent years.

c) Manufacture

- Accounted for 11.6 per cent of GDP in 1987 with most industries coming under the heading of agricultural processing.
- Lost investments and markets through recent transport difficulties.
- Sharp fall in the consumption of consumer goods, itself the result of foreign exchange shortages and falling real incomes.
- Malawi is a landlocked country and heavily dependent on its neighbours for transport routes to the sea for imports and exports.
- With civil war in Mozambique external trade routes are in deep trouble with almost all import and export trade currently directed at considerable cost through South Africa.

d) Foreign Trade

- Malawi's trade balance is dominated by production levels and world market conditions for few major export crops, namely tobacco, tea, sugar and more recently maize, in which the country has specialized.
- The inevitable savings in export earnings have been exaggerated in recent years by transport problems.

Food Crops	Cash Crops
Main subsistence crop is maize.	Maize
Other subsistence crops are	Cotton
Sorghum	Rice
Millet	Groundnuts
Pulses	Tobacco
Root crops	Coffee
Fruit	Sugar
Fish	

Estate Crops

Tobacco	* export earner, 67 per cent of agric exports in 87
Tea	11 per cent share of agric exports
Sugar	10 per cent share of agric exports
Coffee	4 per cent share of agric exports
Rubber	
Macademia nuts	

Agricultural Processing

Tea factories
Cotton ginneries
Tobacco factories
Flourmills and plywood
Oil and grain mills
Abattoirs and cold storage plants
Soaps, detergents, glycerins and animal feed
Textiles

15. TANZANIA

a) Production

- Agriculture accounted for over 50 per cent of GDP in 1986.
- Amount of production entering the monetary economy varies and data collection is complicated by large sales of crops through unofficial and other illegal channels.
- Only 6.2 mha (appr. 8 per cent of the country) is estimated to be under cultivation and only 3 per cent of this area is irrigated. Much of the country has low and erratic rainfall; shortfalls caused food problems in 1988.
- Programmes to combat soil erosion and deforestation are urgently needed but are limited by a lack of resources.
- Food crops production is mainly undertaken by peasant smallholders, operating with a low level of technology and low yields.

b) Livestock

Offlake of locally consumed and marketed livestock is low, only 10.7 per cent according to FAO estimates; recent performance in the livestock industry has generally been disappointing.

c) Manufacturing

- The contribution of manufacturing to GDP has dropped due to the very low capacity utilisation, e.g. the textile sector averaged only 30 per cent capacity utilization, thereby contributing to high unit costs.
- Decline in industrial output resulted from high import dependency which led to shortfalls in raw materials and essential spare parts as the foreign exchange constraint grew worse.

d) Transport

- Inadequacy of the transport system and a lack of resources to maintain it have acted as a severe constraint on the expansion of output. More remote regions, especially in the south, still have rudimentary transport systems.

TANZANIA

Principal Food Crops	Cash Crops	
Maize	Coffee)	
Rice, paddy	Cotton)	Grown mainly
Wheat	Tobacco)	by peasant
Millet	Cashewnuts)	farmers.
Sorghum	Sisal)	Grown mainly on
Cereals	Tea)	large states.
Cassava	Sugar	

Agricultural Processing	Exports
Meat canning	Coffee
Brewing	Cotton
Cigarette manufacture	Manufactures
Pyrethrum processing	Cloves
Cashewnut shelling	Cashewnuts
Textiles (6 large mills)	Sisal
Sugar refing	
Coffee processing ?	
Cotton	

16. KENYA

a) Production

- Agriculture and ranching are still the most important economic activities in Kenya accounting (with forestry and fishing) for 31 per cent of GDP and 26 per cent of wage employment in 1987.
- More than 50 per cent of agricultural output is for subsistence; the two main cash crops, coffee and tea, are Kenya's main source of foreign exchange.
- Acute shortage of arable land - only 18 per cent of Kenya's soil is categorised as being of medium or high potential and some of this is already overc· ·wded leading to a growing shortage of cultivable land.

- Agricultural marketing meanwhile remains a bone of contention with the World Bank, which has been pressing for a much greater liberalisation of grain marketing structures than the Government.
- Coffe production is indirectly constrained by the International Coffee agreement (ICA), which has set export quotas well below Kenya's potential output in recent years.
- Deforestation is a major constraint because greater than 50 per cent of energy used in Kenya has been estimated to come from firewood and a further 8 per cent from charcoal.

b) Manufacturing

- Although Kenya is industrially the most developed country in East Africa, manufacturing still accounts for under 12 per cent of GDP.
- Foreign capital has played an important role in Kenya's industrialisation; the role of foreign capital is to some extent backfiring on Kenya now, given the stringent rules of origin applied by the Preferential Trade area (PTA) for East and Southern Africa if companies are to qualify for tariff reductions.
- Heavy protection offered to industry, Kenya's industrial structure is unusually strongly skewed towards large scale units and towards products that are relatively capital intensive.
- Market size is generally regarded as small.

K E N Y A

Food Crops	Cash Crops
Maize - self-sufficient in a normal year	Coffee - main
Beans	Tea
Sorghum	
Millet	Milk and milk products
Root crops	
Wheat	

Agricultural exports	Manufacturing in order of contribution to GDP
Pyrethrum	Beverages and tobacco
Sisal	Textiles
Meat and meat products	Miscellaneous food products
Hides and skins	Petroleum products
Fresh fruits and vegetables	Motor vehicle assembly
Cotton	Other automobile products
Cashew nuts	Pulp and paper
Wattleback extract	Sugar and confectionery
Pulses	Canned fruits and vegetables e.g. pineapples
	Rubber
	Clothing
	Meat and dairy products
	Wood and cork products
	Leather and leather goods

Mr. Omosaiye's report:

CONSTRAINTS BY COMPONENT

COMPONENT 1: AGRO-ECOLOGICAL CONSTRAINTS

- Periodical droughts and floods;
- Periodical infestations of locusts and pests;
- Periodical cyclones;
- Sandstorms and sand-dunes, reducing arable lands;
- Other natural calamities.

COMPONENT 2: POTENTIAL LAND RESOURCES

- Land erosion;
- Desert encroachment limiting available arable lands;
- Insufficient arable lands due to high population density in a number of small area countries.

COMPONENT 3: IMPROVEMENTS IN INVESTMENT ENHANCING LAND POTENTIAL

- Lack of financial resources for imports of agricultural inputs (equipment, fertilizers, pesticides, irrigation equipment);
- Lack of expertise leading to wrong choice of agricultural equipment;
- Traditional farmers' resistance to modern agricultural techniques;

COMPONENT 4: HUMAN RESOURCES

- Inadequate development of human resources at all levels - managerial, supervisory and shopfloor;
- General lack of specialization and skilled manpower in food industries subsectors; lack of training facilities;
- Manpower training not suited to the demands of food industry;
- Faulty educational system, lack of linkage between agro-industries and education plans;

- Ratio of students at technical colleges to universities, which should be 3 to 1, has not been achieved in African countries;
- Inadequate number of cadres and technicians working in agriculture in relation to total agricultural workforce.

COMPONENT 5: LAND USE (MEAN AREA CULTIVATED)

- Rudimentary agricultural tools and traditional techniques leading to low productivity;
- Government policies on land use are inadequate and inconsistent.

COMPONENT 6: CROP PRODUCTION

- Insufficient water supply (rainfall, irrigation);
- Use of traditional tools and techniques leading to low productivity;
- Rural exodus;
- Lack of agricultural inputs (machinery, fertilizers, pesticides);
- Lack of high yield varieties, responding to expected standards and R & D;
- Poor farm management;
- Lack of adequate storage and preservation leading to high post-harvest losses;
- Inadequate commodity prices.

COMPONENT 7: LIVESTOCK RESOURCES

- Unreliable ownership census.
- Shortage of animal feed resources.

COMPONENT 8: LIVESTOCK PRODUCTION

- Insufficient and inadequate grazing and pasture-land;
- Insufficient animal feed;
- Insufficient skilled manpower (management, veterinary doctors and technicians);
- Insufficient storage and cold room facilities;
- Low livestock products consumption per capita;
- Lack of external outlets.

COMPONENT 9: INDUSTRIAL INFRASTRUCTURE AND MANUFACTURING CAPACITY

- Poor supply of power and water in quantity and quality.
- High and sometimes prohibitive cost of energy when available.
- Improper location of processing plant. Lack of processing facilities.
- Inappropriate manufacturing and packaging technologies leading to high production costs.
- Lack of expertise in the choice of technologies and equipment.
- Poor management skills and lack of technical know-how.
- Poor project planning, formulation and implementation.
- Inadequate and/or lack of industrial supporting facilities and services (foundries, forges, machine shops, transport, quality control, maintenance, spare parts, research and development, industrial training, industrial expertise).
- Inadequate supply of raw materials in quantity and quality.

COMPONENT 10: DOMESTIC MARKET FOR AGRO-PROCESSED FOODS

- Size of population;
- Low purchasing power of that population;
- Food consumption patterns may influence and/or limit growth of domestic markets.

COMPONENT 11: SIZE OF PROCESSED FOOD INDUSTRY

- Lack of market, both internal and external;
- Insufficient or lack of raw material supply;
- Lack or insufficient technical know-how related to oversizing of factories;
- Inadequate maintenance, lack of spare parts;
- Lack of managerial skills.

COMPONENT 12: RELATIVE PERFORMANCE OF MANUFACTURING SECTOR

- Lack or insufficient skilled/specialised manpower in specific technical areas;
- Poor supply of inputs (raw materials, spare parts);
- Limited markets for the final products;
- Poor management.

COMPONENT 13: EXTERNAL MARKET, EXPORT

- Tariff and non-tariff barriers in potential importing countries;
- Stringent quality standards including labelling;
- Non competitiveness (price wise).

COMPONENT 14: ECONOMIC STRUCTURE

- Lack of industrial integration with the overall economic structure;
- Poor industrial infrastructure.

COMPONENT 15: ECONOMIC POLICIES

- Inconsistent industrial Government policies;
- Inadequate protection of local industries;
- Inadequate import/price policies.