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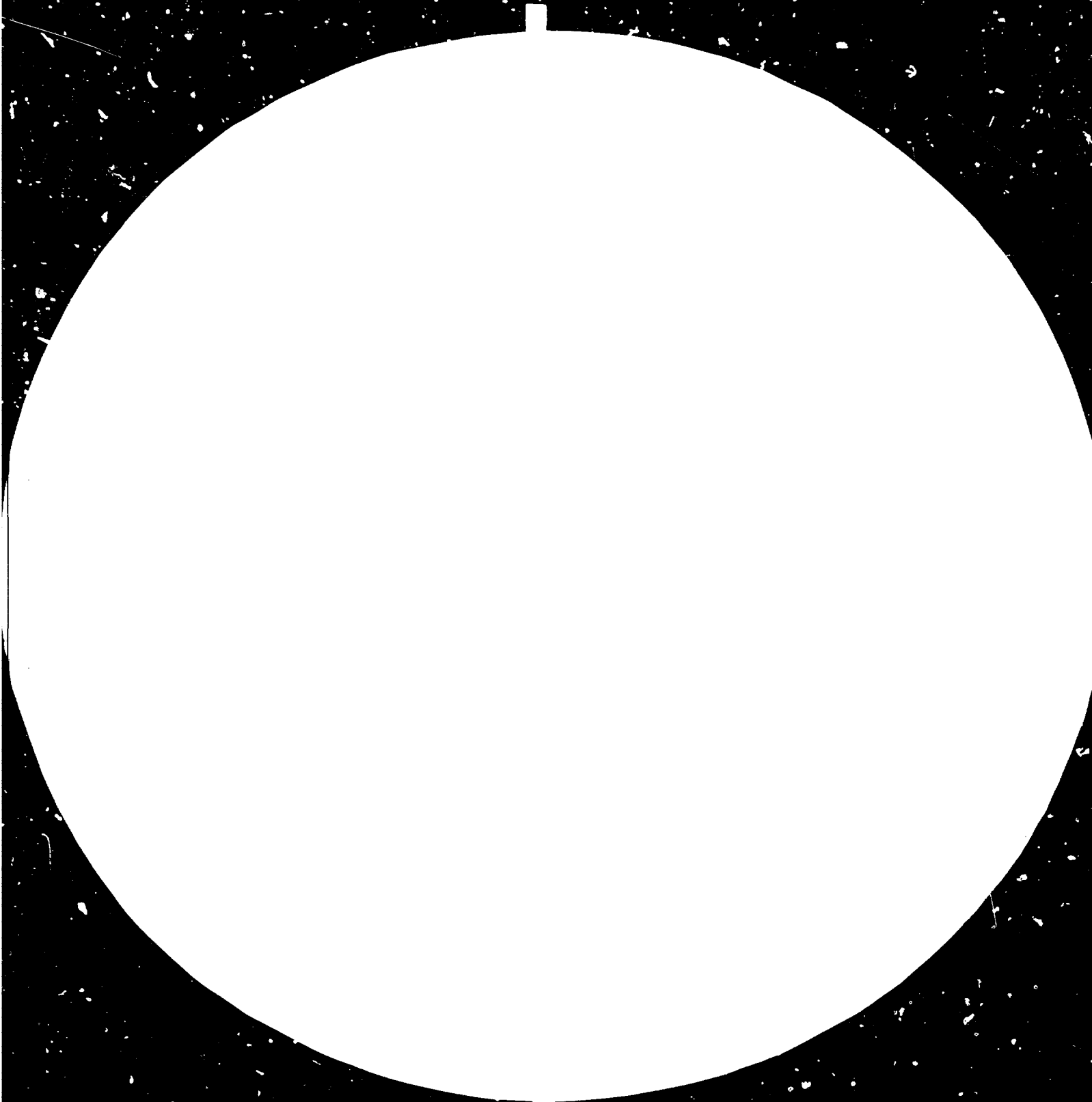
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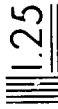
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AGRO-INDUSTRY (FOOD PROCESSING) DEVELOPMENT
IN LATIN AMERICA

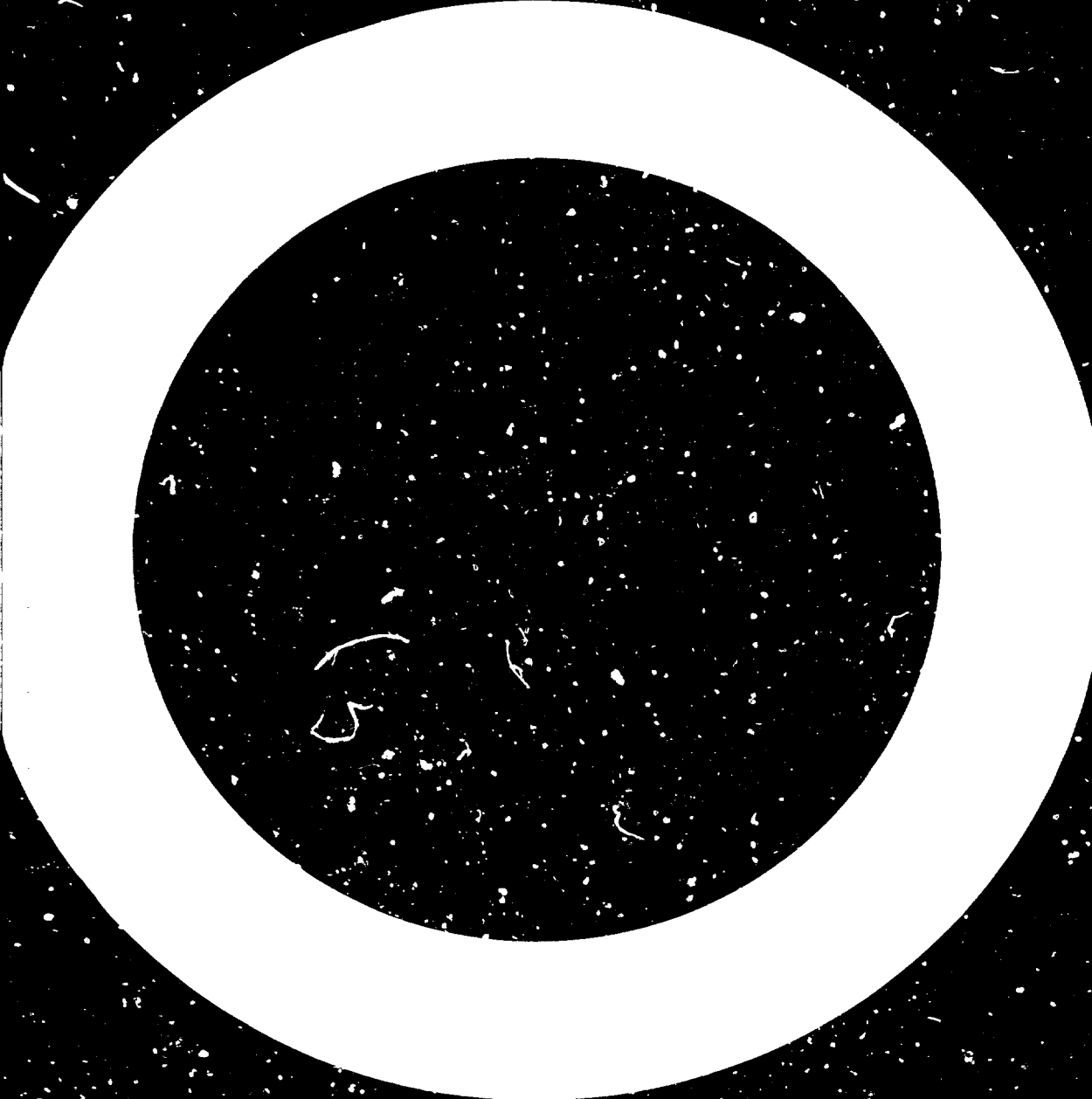
Prepared by

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Division of Industrial Operations

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SUMMARY

Although a food processing industry exists in almost all developing countries there is some controversy concerning integrated agro-industry. Integration is frequently interpreted as a need for having all activities related to agricultural production, processing and distribution under one enterprise; this is not necessarily the case. The largest and most advanced food processing industries do not have farms and they do not extend into final market distribution. However, they have the ways and means to secure agricultural production in accordance with the processing industry's needs and they also have sufficient means to influence the market and to secure the demand for their products.

The activities of integrated agro-industries are complex and fall in various fields of activities such as agriculture, industry, commerce and normally there is no single governmental institution to deal with the whole chain of operations. Therefore, although the need for agro-industry development is recognized, in most countries there are no specific instruments to promote and assist such development in an integrated manner.

It is evident that food processing cannot be successful if it does not have specialized agricultural production to supply the needs of the processing industry. Therefore, in the traditional way of processing surpluses of agricultural produce, a sound agro-industry development is not possible. The evidence is that food supplies are not increasing adequately in most Latin American countries and that the demand for industrially-processed food is increasing and will be more and more required as the economies develop.

Although most Latin American Governments place high priority on agro-industry development and are implementing programmes to this end, there is still a need for a clear, objective guideline with quantitative evaluations of the ways and means of achieving the planned targets.

A programme of co-operation among Latin American countries would be desirable for each country individually and for the region as a whole. Such a programme would require a concentration of efforts from the interested Governments, regional organizations such as ECLA and ALICA, and international organizations such as FAO, UNIDO, OAS, Bank for Inter-American Development and the World Bank. The aim of such a study would be to evaluate in each

country the actual status of agro-industry development and to point out its potentials and limitations. This would be the basis for planning the sector's development in each country and estimating the needs for programmes to be carried out at the regional and subregional level.

I. THE ROLE OF UNIDO IN AGRO-INDUSTRY DEVELOPMENT

The United Nations Industrial Development Organization (UNIDO) is the United Nations organization that specializes in assisting developing countries develop their industry. It works by providing technical assistance through the services of experts; operating training programmes; and supplying special equipment for research and development, pilot plants and some operating equipment and spare parts. UNIDO is not a financing organization, but it does assist in locating potential investors and helps in negotiating loans, joint ventures and transfer of technology and in other ways needed for the establishment of new industries, as well as rehabilitation, modernization and expansion of existing ones.

UNIDO has Branches and Sections dealing with most of the industrial subsectors; among them is the Agro-Industries Branch, which comprises food processing, textiles, leather and leather products, wood products and packaging (especially packaging for food products). UNIDO activities in food processing are concerned only with industrial aspects of the food production chain.

UNIDO experience in food processing has been applied over the last fifteen years. Although some studies have been carried out, most of UNIDO work in this field has been of a pragmatic nature, following the requests of Governments to solve specific problems of existing industries or formulating projects for the establishment of new ones. The problems faced by UNIDO experts in assisting developing countries have in several cases been related to equipment, layout, production methods, qualification of personnel, plant location etc. However, the two most frequent problems - shortages of agricultural produce and inadequate demand - not actually industrial problems.

It is commonly accepted that fresh foods are better than processed foods. Moreover, since processed foods require industrial operations, packaging and distribution with large advertising costs, fresh food should cost less than processed food. The conclusion is that processing food would be justified only to preserve surpluses of agricultural produce that otherwise would be spoiled.

That idea is commonly faced by UNIDO experts when planning the establishment of food-processing industries; requests are made for such plans when there is an abundance of agricultural produce that is being lost. The reason

why many plants in developing countries are working below capacity or not at all is that they were established to process a surplus of agricultural produce. That was a mistake, since it implies competition with fresh products, processing products that do not have the proper qualities for processing, and facing situations in which the surplus does not exist anymore and the industrial plant cannot operate.

The situation is encountered in numerous projects, and surveys made by UNIDO reveal that the situation prevails in most of the developing countries. The shortage of agricultural produce for processing, however, is only part of the problem. There is also a shortage of fresh food products, and in addition there is a large and increasing importation of food products in many developing countries. The problem is that the supply of locally produce food is not adequate and does not increase with demand.

In order better to understand the problem, a brief summary of the reasons why food industries started and progressed in developed countries will be made.

II. FOOD PROCESSING INDUSTRY

In his book, At Home and Abroad, Thomas Horst examines the economic forces shaping the development of the food processing industry,^{1/} pointing out the reasons why the industry started in such branches as meat packaging, milk canning, condensed soup, conserves (ketchup, pickles, jelly, apple butter, mustard, pudding), cold cereals, soft drinks and chocolate.

Meat packaging was introduced because of the distance between the internal region of the United States of America known as the Midwest and the east coast. Livestock was raised in the Midwest, but the east coast was the largest market for meat. Refrigerated railway cars were introduced to avoid the transport of animals from one place to the other. That was the beginning of a large industry that later on expanded to include other lines to handle fish, poultry, eggs, milk, butter and cheese. During the 1850s, transatlantic ships provided milk to passengers by keeping a herd of cows in stalls below deck. To avoid taking cows to sea, an inventor developed a process to preserve milk. A famous soup company started in 1897 when a method of condensing soup was discovered, saving on both canning and transport costs in relation to the ready-made soup being sold.

Besides technological innovation to produce foods with longer shelf-life, reduce transport costs and make better use of available raw materials, advertising aimed at creating new eating habits also played an important role in the development of food processing industries.

But food processing is also a necessity; there are foods (vegetable oils, sugar etc.) that can be consumed only as industrialized products. It is known that with economic development, increasing urbanization and increased participation of women in the labour force, the consumption of processed foods increases. The proportion of industrially processed foods in total food consumed in the United States is 92 per cent; in the United Kingdom of Great Britain and Northern Ireland, France and Italy it is 79, 73 and 70 per cent.^{2/} Although data is not available, it is estimated that less than 10 per cent of the food consumed in developing countries are industrially processed.

^{1/} Thomas Horst, At Home and Abroad (Cambridge, Mass., Ballinger Publishing Company, 1980)

^{2/} Juan Manuel Castells, La Crisis de Alimentos en America Latina (Montevideo, February 1982), p. 15.

Processing food is not a luxury; it is an increasing requirement that is aimed at making the supply more adequate to the demand. It is important to the developing world because the production of food is not increasing there. The reason is not lack of technology - technology is available for most of the processed food requirements; nor is it the non-existence of processing industries - there are numerous plants in developing countries working at below capacity; nor is it that the supply of fresh products is adequate - the per capita consumption of foods in developing countries is far below standard. It is a combination of factors that inhibits food production as a whole and industrialized food products in particular.

To analyse causes affecting food production development in developing countries is beyond the scope of this paper. The analysis would show however, that no food processing industry can be successful if it is based on traditional forms of agricultural production. An agro-industrial operation must rely on continuous production of agricultural raw material adequate for processing in terms of timing, quality, quantity and price. If there is indeed a need for food processing industries in developing countries, new models of agro-industry should be designed to operate in accordance with the socio-economic and political conditions prevailing in those countries.

III. AGRO-INDUSTRY MODELS

An agro-industry model should do the following:

- (a) Produce agricultural raw materials in accordance with the needs of the processing industry;
- (b) Contribute to increasing the overall supply of food;
- (c) Create productive employment and absorb rural population in higher and moder qualified jobs;
- (d) Reduce losses of agricultural produce and reduce volumes to be transported;
- (e) Contribute to the overall economy by supplying more food at lower prices to the local market and reducing the pressure on foreign exchange by reducing imports and increasing exports.

Every agro-industry model implies an integration of agricultural production, processing industry and distribution of final products. The planning of agro-industries should start from the market with the identification of the foods being demanded, and then go back to identify the products that could be advantageously produced by the primary sector. After that comes the determination of the most convenient type of processing, packaging and distribution of final products.

The term "integration" suggests that agro-industries should be under only one enterprise. That is not necessarily the case. In the United States there is a very large number of integrated agro-industries, but there are different enterprises in each phase. Food processing enterprises in the United States generally do not have farms and they do not themselves distribute the final products. Instead, they contract with farmers to produce the food in accordance with their requirements; concerning distribution, the pattern varies substantially from enterprise to enterprise. Horst^{1/} makes a thorough analysis of the reasons for the growth of the larger food processing enterprises; one of the most important aspects mentioned by him is the system each company finds for the distribution of their products either through wholesale outlets or small stores. He concludes that an individual distribution system is very costly and is justified only for producers with a very extensive production line. Therefore, the rule in the United States where food processing is a highly developed industry, is that the integration is not under a single enterprise covering the whole production chain.

In the United States, where food is abundant, the processing industry leads in determining what should be produced by agriculture and has the means to influence the consumer market. That type of enterprise also exists in developing countries, both transnational and national. They are not, however, able to solve all the problems mentioned above and many Governments are involved in programmes for promoting agro-industrial development. But it is not yet clear what agro-industry really means and how to promote it.

Recently a large mission from the World Bank visited a developing country to establish the basis for opening a credit line for financing agro-industrial development projects. The management of the national bank refused to accept the opening of such a credit line on the ground that prior to receiving the aid, the country should make an effort to clarify what agro-industry entails, how it should be promoted, what kind of special treatment should be given to stimulate agro-industries, what the constraints affecting the development of agro-industries were etc. The situation was not exceptional: A large number of countries, although having agro-industry development as a high priority, do not have a clear conception of the types of enterprise and activity that fall into the category of agro-industry.

Of the countries being assisted by UNIDO, specifically through projects backstopped by the Agro-Industries Branch of the Division of Industrial Operations, a large number are involved in clarifying the concept of agro-industry, defining the most adequate models of agro-industry to be established and formulating policies to promote and assist in agro-industry development. The number includes the following countries: Angola, Algeria, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Malawi, Mexico, Morocco, Niger, Nigeria, Panama, Paraguay, Peru, Rwanda, Thailand, United Republic of Tanzania, Uruguay and Venezuela.

In all of these countries there is a need to increase food processing production, create employment in the rural areas, improve the use of agricultural resources, reduce transport costs, produce better foods at lower costs and, finally, incorporate the small farmers into the modern economy by increasing their income, thereby enlarging the local market with industrial products and settling the rural population in the rural areas, thus reducing or eliminating the exodus towards the large cities. The type of enterprise could be a co-operative or a single or multiple enterprise covering the complete production chain in one or two phases. The only point that matters is that the enterprise should be viable and able to contribute to the country's economic and social development.

IV. TYPES OF ASSISTANCE IN THE FIELD OF AGRO-INDUSTRY
BEING IMPLEMENTED BY UNIDO

Without entering into details of each type of technical assistance project being implemented by UNIDO, the following subjects are being dealt with in current projects:

Overall agro-industrial development plans

Regional agro-industry planning in one or several countries

Design of agro-industry model

Research and development on agro-industry products

Comparative analysis of agro-industry development in developed countries and the elaboration of policies for promoting agro-industry development in developing countries

Pilot-plant installation and operation

Rehabilitation, modernization and expansion of complete food processing subsectors at the national level or for a single food processing plant

Establishment of food testing and quality control facilities

Establishment and assistance in running food research and development centres

Assistance in creating the institutional framework to promote and assist in integrated agro-industry development

Elaboration of feasibility studies for the establishment of food processing industries in developing countries individually or on a regional or subregional basis

Promotion of investment in agro-industries in developing countries

Research on production of foods with local, rather than imported, raw materials

Promotion of technological changes

The list above, which is not exhaustive, shows the wide range of subjects covered by the UNIDO technical assistance programme in the field of agro-industry. Taking into account that such assistance is provided only on receipt of an official request from a Government, the lists of countries and subjects given above are indicative of the high interest in agro-industry development and of the nature of the required assistance.

V. FOOD PROCESSING IN LATIN AMERICA

The GNP of Latin America has been growing at the rate of over 6 per cent per annum; in 1974 the region's GNP was valued at \$220 billion, four times as large as in 1950. It was an impressive performance, particularly important in the region's industrial sector. The economic activity of Latin America has changed considerably, especially when compared with the rest of the world; imports and exports are considerable and about 20 per cent of the region's exports are industrial products.^{3/}

Food production, however, especially for local consumption, has not developed in line with the region's overall economic development.

In his book La Crisis de Alimentos en America Latina, Juan Manuel Castells arrives at the conclusion that the basic reason for the food production crises in the region is the low productivity in agriculture and that low productivity is mainly due to the myth that Latin America has an agricultural vocation and therefore the potentiality for agricultural production was more or less taken for granted; hence no proper policy of technological development and support to agriculture was systematically implemented.^{4/} According to the author this explains the low level of technology prevailing in the region and the consequent low productivity. One of the examples given by the author to illustrate the crises of agricultural production is the importation by Chile of a million metric tons of wheat in 1976 and 1978; at the beginning of the century Chile was a wheat-exporting country. (Most of the Latin American countries have become increasingly dependent upon wheat because for many years wheat has been sold at low, subsidized prices in most of Latin America, with the double effect of increasing the local demand for wheat products and discouraging local production of this cereal.)

Concerning the food processing industry, Horst says:

"The food processing industry never has been what one would think of as high technology industry. Many of the basic food manufacturing processes - pasteurization, canning and preserving, milling, baking, and others - go back decades, centuries or even millenia. Much of the technological progress affecting food processing originated in other sectors of the economy: government-sponsored research, chemical discoveries, machinery

^{3/} E.V. Iglesias, La Cepal y las Relaciones Economicas de America Latina (Santiago, 1981).

^{4/} Castells, op. cit.

design, and so forth. According to the National Science Foundation, in 1969 the food and beverages industry spent only 0.4 per cent of its sales on research and development, which compares rather unfavourably with the 4 per cent average for all manufacturing industries. But research and development is the first step in an increasingly costly process of new products market introduction." 5/

This aspect of the problem is essential; the cost of introducing new products into the market and the difficulties in marketing the products require test-marketing and extensive advertising. Through a costly and time-consuming campaign, the food producing enterprises create a demand and convince the retailers to "carry out" their products.

Although productivity, technology etc. are important aspects, food production and particularly the processing industry in Latin America need to be thoroughly studied. A regional study for the rehabilitation, expansion and modernization of the region's food processing industry is certainly justified. There are a large number of positive aspects in the region which should be mobilized and put to work in a systematic way to overcome problems and to open up new avenues for the region's development, on the basis of a sound, integrated agro-industry (food processing) development. The following points should be taken into consideration:

(a) There is in Latin America an association (ALICA) whose members include most of the Latin American countries;

(b) In most of the Latin American countries there are qualified research and development centres equipped with pilot plants and other facilities, qualified personnel etc. which could be engaged in all research and development work for regional food processing development;

(c) Most of the Governments place high priority on agro-industry (food processing) development;

(d) There is a large market for processed food products in the region;

(e) The problems faced in most of the countries are similar and there is a need to overcome them as soon as possible;

(f) A regional programme for food processing development would be based on co-operation among developing countries; although regional, such a programme would not aim at complementarities among the countries - each country would aim at increasing self-sufficiency.

5/ Horst, op. cit.

VI. AGRO-INDUSTRY (FOOD PROCESSING) PROGRAMMES IN LATIN AMERICA

The following paragraphs describe food processing programmes in Latin America in which UNIDO has some involvement.

In Argentina, the Government is involved in establishing programmes for the training of food processing technologists, and in the National Institute of Technology, food processing pilot plants will be established with the aim of assisting Argentine food processing industries, especially small and medium-size enterprises. It is known that various subsectors, especially meat processing, require a large programme of rehabilitation and modernization.

In Bolivia, the Government places high priority on the expansion of the food industry in general and particularly the subsectors of vegetable oil processing and animal feed production require extensive programmes of technical assistance.

The Brazilian Government is fully involved in programmes for food production development. There are large irrigation and drainage projects and extensive research and development is being carried out to clarify the "unknowns" of the Amazon. In particular, the programme of creating a high-level nucleus to advise the Ministers of Planning and Agriculture on policies regarding agro-industry development should be mentioned. A branch for research and development in packaging is being established in the Technological Food Institute.

In Colombia, there is a working group composed of members from the Ministries of Planning and Agriculture and other ministries with the participation of the associations of industrial and agricultural entrepreneurs and financial organizations, particularly the Republic Bank. This working group is involved in programmes and specific projects for agro-industry (food processing) development.

In Costa Rica, there is a programme to promote small and medium-scale food processing enterprises.

In Cuba, the Government is fully involved in programmes for modernizing the country's traditional food processing industry and expanding and diversifying the agro-industry sector.

In the Dominican Republic the Agro-Industry Law was recently enacted; it defines agro-industry subject to special promotional incentives. There is an integrated working group composed of members from various ministries and financial organizations which formulates and assists in the implementation of integrated agro-industrial projects.

In Ecuador, CENDES is involved in programmes of studying and assisting in the establishment of agro-industries (food processing), and a large research and development programme is being carried out for the utilization of fish pulp as a meat extender.

In Guatemala, the Government has established that agro-industry development is the country's first priority. The governmental programme for the establishment of integrated agro-industries is aimed at incorporating small and medium-size farms in the modern economy and enlarging the country's economic basis.

In Haiti, among the various programmes for the food processing development, a project to produce composite flour to be used as a partial replacement for wheat is being carried out.

In Mexico, Sistema Alimentario Mexicano (SAM), which is aimed at co-ordinating all governmental actions towards a new system of food production, processing and distribution in the country, has first priority. The objectives are to ameliorate food supply at all levels in Mexico and make the country self-sufficient in food production and as much as possible technologically independent. Being the Government's first priority, SAM has a very wide scope and its extensive experience is already internationally known and being used as a model for other developing countries.

In the same way Panama, Paraguay, Peru, El Salvador, Uruguay and Venezuela are all involved in large programmes of agro-industry development comprising studies as well as the elaboration and promotion of specific agro-industry projects.

Latin America is well endowed with research and development centres specializing in food processing. It is a field in which co-operation is being followed not only through regional centres but also through numerous research and training programmes implemented on a multi-national basis.

Agro-industry is a development alternative that is of high priority in all Latin American countries, and most of these countries face similar problems of making better use of agricultural resources to produce foods with a higher level of industrialization and using the food industry development as a vehicle to promote rural development and incorporating the rural population in the modern economy. It is therefore highly recommended that a regional study of the agro-industry development in Latin America be undertaken with the aim of formulating country and regional programmes for the rehabilitation and modernization of the Latin American food processing industry.

VII. TECHNICAL ASSISTANCE PROGRAMME FOR THE LATIN AMERICAN
AGRO-INDUSTRY (FOOD PROCESSING) :
REHABILITATION, MODERNIZATION AND EXPANSION

A. General remarks

The consensus is that the Latin American agro-industry (food processing) industry has not progressed in line with the region's economic and social development and that the region should be self-sufficient with respect to food production and become a net exporter of food. Most of the Latin American Governments place a high priority on agro-industry (food processing) development. Latin American agro-industry problems have been studied; however, a country-by-country analysis that is objective and quantitative is not available. Regional and subregional studies are also not available.

Agro-industry is an industrial branch that has all the conditions for a Latin American integrated and co-operative programme for the following reasons:

- (a) Agro-industry development is a recognized need;
- (b) In all the countries there are old industries operating far below the optimum level;
- (c) The supply of locally produced foods is not adequate for the countries' needs;
- (d) Agricultural resources are not being properly utilized;
- (e) Technological problems affect various countries simultaneously and should be the subject of regional or subregional programmes;
- (f) There are various industries manufacturing food processing equipment in the region and they could be developed if the market for their products were enlarged;
- (g) Research and development centres which exist in most of the countries could carry out co-operation programmes of regional interest;
- (h) Training institutions exist which also carry out programmes of regional interest;
- (i) There is an Association (ALICA) that represents the food processing enterprises of most Latin American countries.

Years ago the Economic Commission for Latin America (ECLA) carried out a regional textile project that consisted of studies for the individual countries and a final report concerning the regional textile sector. A similar study is recommended for the agro-industry (food processing) sector. A study of this magnitude would require large resources and would only be justified on the grounds of being operationally oriented, i.e. it would be used by industrial enterprise and governmental authorities to carry out the recommendations. These authorities should be involved from the beginning; in fact, such a programme should only be pursued at the request of private and governmental authorities, with the formal commitment of country and regional associations to co-operate in its implementation and to make efforts to carry out its recommendations.

A speculation about what such a programme would be like follows in the next section.

B. Preliminary programme contents

The following outline is suggested for the study mentioned at the end of the last section:

1. Market for food processing products

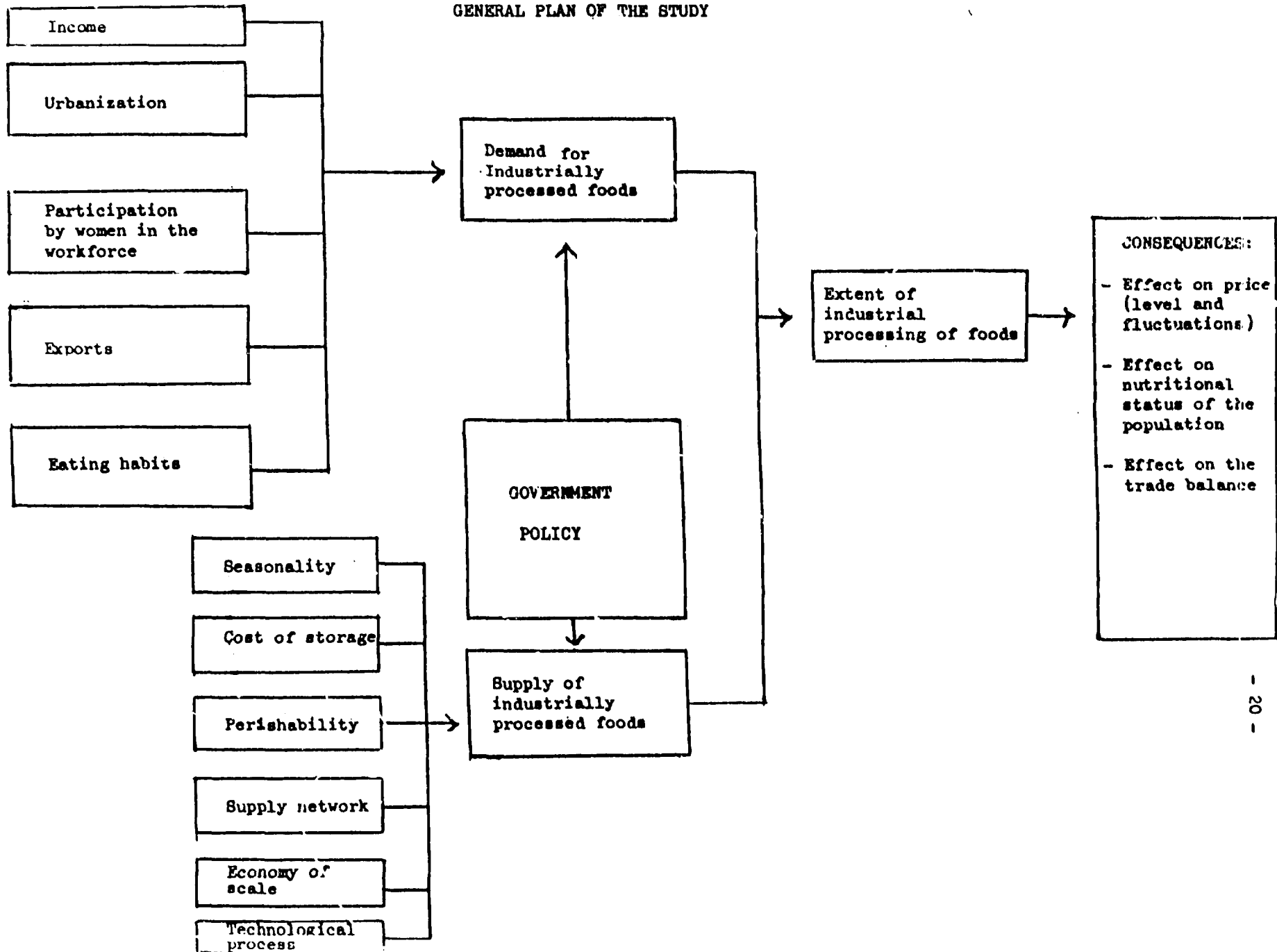
UNIDO is implementing a project for Brazil with the title "Comparative analysis for the agro-industrial development programme and implications of this analysis for Brazil". A schematic description of the project is given in the figure. The idea is to select a certain number of products and, by means of a comparative analysis, to follow the changes in the way such products are consumed over various periods, taking into account increases in the per capita income, urbanization, participation of women in the work-force and other factors.

An analysis of this type could be carried out for the individual countries and the results combined with other observations. Statistical data could be used to elaborate model markets (demand) for processed food products in each country and in the region as a whole.

2. Agricultural produce for food processing

Taking into account the estimated requirements for processed food products mentioned above, estimates would be made of the requirements of agricultural produce for the processing industry.

GENERAL PLAN OF THE STUDY



3. Other inputs to produce processed food products

In the same way as for agricultural produce, estimates would be made concerning packaging requirements, other raw materials, equipment, research and development programmes, training etc.

4. Existing situation

Surveys would be carried out in selected subsectors of the food industry in order to assess:

Existing factories and their problems

Existing research and development centres, the research programmes being implemented. available capabilities etc.

The food distribution system and its main limitations

The institutional framework regulating agro-industrial activities

Other elements affecting food processing and distribution

5. Country programme

Taking into account the projected food processing requirements and the existing industries, research and development centres, distribution network, institutional framework, specific programmes would be formulated for each country with a detailed description of all actions to be taken including estimates of the resources needed.

6. Regional and subregional programmes

From the country programmes, regional and subregional programmes would be elaborated comprising all the projects which should be implemented in co-operation with various countries and the costs and actions involved in their implementation.

C. Advantages

The advantages of carrying out a Latin American agro-industry development programme are numerous. Initially, a great deal of methodological work would be done to clarify concepts and to work out a realistic basis for comparing data. An objective review of the situation would be made on a quantitative basis eliminating personal and emotional evaluations. A well

elaborated model of agro-industry (food processing) development would be available to each Government. The need for packaging, equipment etc. would be evaluated and this would be a good basis for inducing investment in its production in Latin America. A clear idea would come to mind concerning the regional potentialities for training personnel for research and development etc. Finally, the knowledge of the existing food processing industries and their problems would be a basis for working out programmes of technical assistance.

Many other advantages could be mentioned. Such a challenging programme, if properly implemented, could have an enormous impact on the Latin American economic and social development in the year 2000.

