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United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.120/11
14 August 1972

ORIGINAL: ENGLISH

Expert group meeting on pre-investment considerations and technical and economic production criteria in the oilseed processing industry
Vienna, Austria, 16 - 20 October 1972

UNIDO ACTIVITIES IN THE VEGETABLE OIL INDUSTRY AND SOME BASIC VIEWS ON INDUSTRIALIZATION 1/

prepared by

the Secretariat of UNIDO

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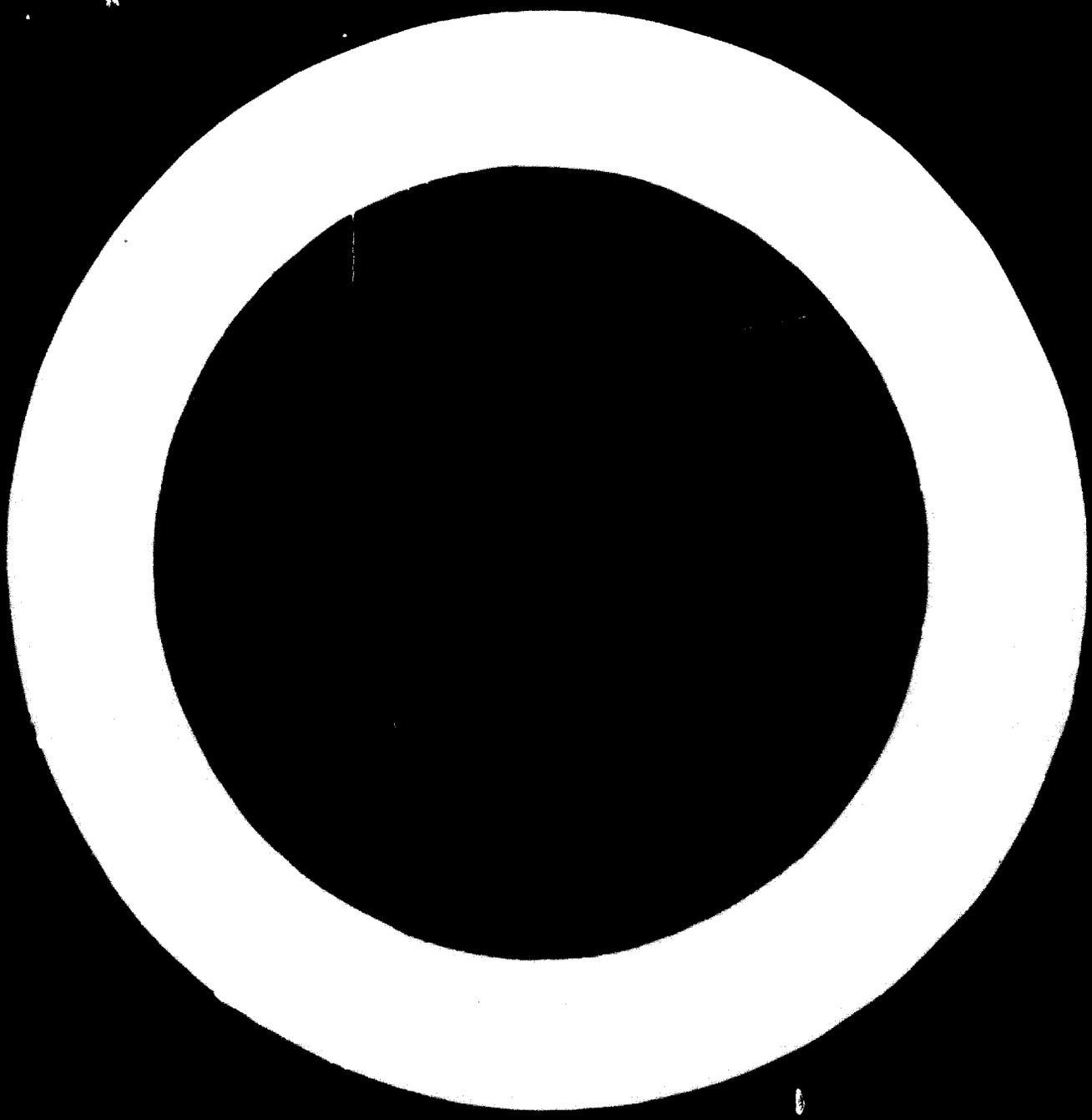
id.72-5215



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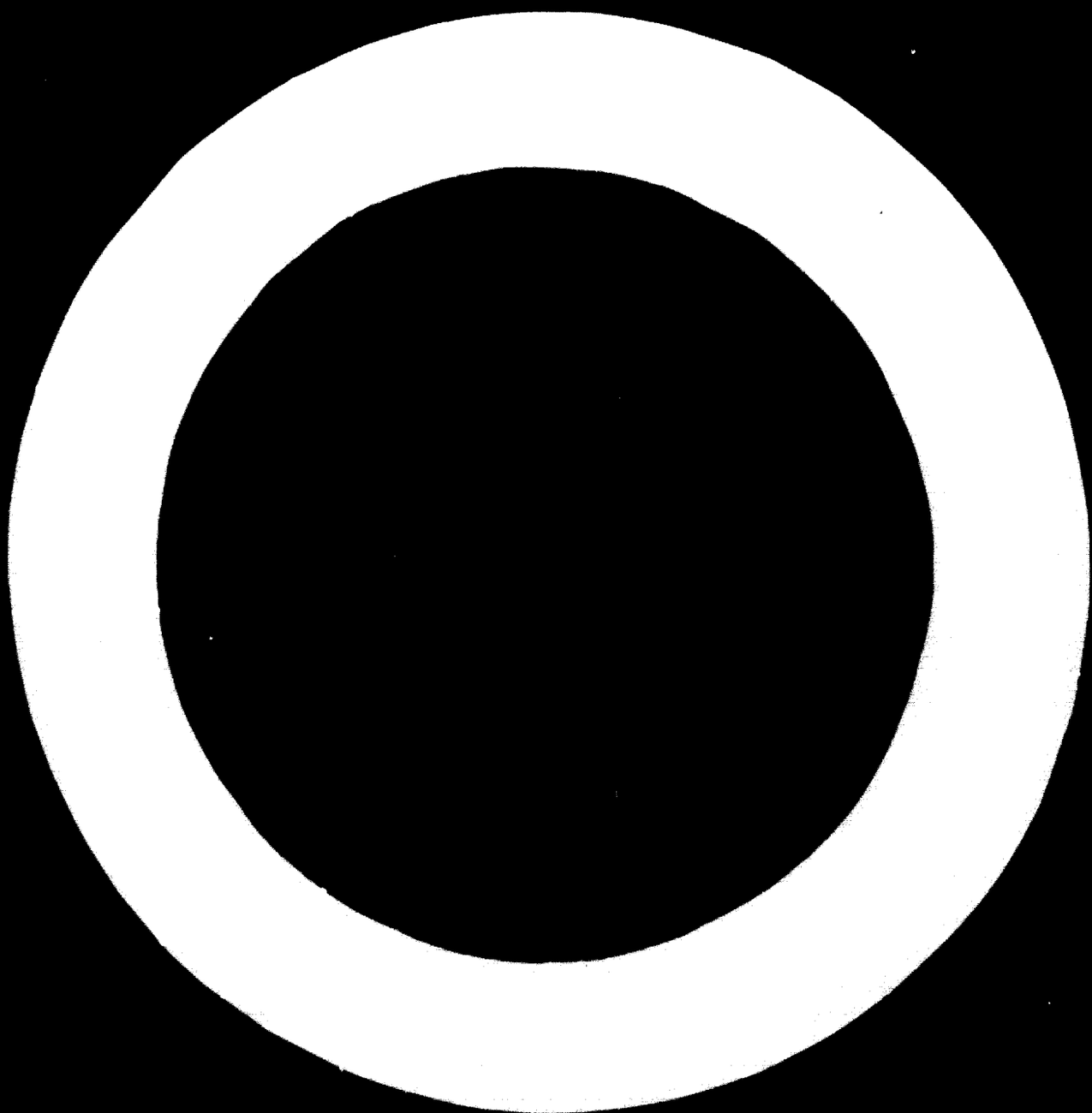


I INTRODUCTION

The production of edible vegetable oils from various oilseeds and fruits has always been an essential human activity. In the past, high-yielding oilseeds such as sesame, groundnuts, coconuts etc., were crushed and squeezed in order to obtain edible oil by using simple methods and unsophisticated equipment. Even today oilseed crushing is carried out in a similar way in a number of developing countries where oilseeds and oil fruits are grown on a small-holder basis.

During the course of time oilseed production has become an organized agricultural activity which created an international market and consequently resulted in the development of the oilseed processing activities from a mere small-scale level to a real commercial industry. At the present time the oilseed processing industry forms the basis for a wide branch of industries producing a variety of vegetable oil and vegetable protein products which have become well established in our daily lives.

Most of the oilseeds and oil fruits are grown in tropical and sub-tropical areas and, therefore, form the natural raw material basis for the establishment of a modern up-to-date oilseed processing industry in developing countries, the products of which considerably add to the basic food supply of the country's population and may be an important earner of foreign exchange if exported.

Oilseed processing has, therefore, to be considered an industrial activity. The development of existing factories and the establishment of new processing plants embrace all the technical and economic problems necessarily involved in industrialization. It is the industrial approach which has, therefore, to be applied in oilseed processing. UNIDO is not only concerned with pointing out and explaining these facts to investors and industrialists engaged in the oilseed processing industry but, also on their request, to actively assist them in their operation.

Vegetable oil industrialists should be aware of the fact that oilseeds are agricultural raw materials of high value which have not yet been fully utilized. A great field of industrial activities in oilseed processing and edible oil and edible fat production is still open for action. Particularly in developing countries thorough investigations need to be made in the vegetable oil industries sector in order to prepare the ground for appropriate industrial development. The elaboration of industrial feasibility studies, therefore, plays a very important role in this connexion.

II: INDUSTRIAL FEASIBILITY STUDIES

An essential activity in the pre-investment stage of industrial project planning is the elaboration of industrial feasibility studies. However, the importance of feasibility calculations is still not fully recognized by some of the industrialists and investors in developing countries. Processing plants have been established which have not been based on detailed feasibility studies. Many such plants had to be closed down soon after they were started up because the products produced were not marketable or only insufficient quantities or unsuitable quality of raw materials were available, the production costs were unreasonably high or some other serious handicap was suddenly realized.

UNIDO is concerned with helping to avoid such failures and to assisting government institutions and also private enterprises in carrying out detailed and comprehensive industrial feasibility studies in the vegetable oil industries sector. A number of internationally acknowledged experts, firms and organizations are co-operating with UNIDO, the services of which may be made available to interested parties on request. For more detailed information we would like to bring some of the typical UNIDO assistance projects to the attention of this audience.

UNIDO operations

UNIDO experts have studied the situation in the vegetable oil industries sector in Bolivia. A technical and economic feasibility study was carried out which resulted in specific recommendations for the establishment of a new vegetable oil factory. Considerable quantities of cottonseed and soyabeans, so far only inappropriately utilized, formed the basis for a new modern plant, the products of which helped to satisfy the local market demand and by reducing or even stopping edible oil imports the country will save valuable foreign exchange.

A general survey of the vegetable oil and feed industry was undertaken by UNIDO experts in Haiti. In this case new investments did not appear to be useful at that time. However, a number of recommendations were issued for the improvement and re-organization of existing production units.

On the request of the Government of Lebanon a detailed study was carried out for the production and processing of sunflower in certain areas where the climatic conditions appeared to be suitable. The study proved that the country would find it difficult to achieve the expected economic results by only sunflower production and processing and additional proposals were submitted to the relevant authorities for their consideration.

The existing situation in the vegetable oil and protein feed sector in Rwanda was studied and evaluated by UNIDO experts. The studies resulted in specific proposals for the establishment of a vegetable oil and feedstuff factory which would considerably contribute to the improvement of the country's national economy.

UNIDO experts studied the feasibility of a vegetable oil factory proposed to be established in Dahomey. Based on figures and data, specific proposals were made for the establishment of a new oilseed processing plant based on groundnuts, cottonseed and palm kernels. A suitable technical project was recommended, the basic technical and economic data of which were specified and the financial requirements estimated.

A similar study was undertaken by UNIDO experts in Togo. The local market situation and considerable quantities of palm kernels, copra and cottonseed not yet fully utilized justified the establishment of a medium-sized oilseed processing plant.

On the request of the Government of Nepal UNIDO specialists carried out a survey of the existing situation of their vegetable oil industry. Specific proposals were put forward for the introduction of certain organizational measures in connexion with the establishment of new oilseed and vegetable oil processing facilities.

UNIDO is paying special attention to the development of the entire field of the coconut industry. The ECAFE countries, for example, are annually producing about two million tons of copra. The major part of which is exported and only about 15 - 20% is processed by a local copra processing industry. This situation clearly shows the basic problem. The coconut industry in many developing countries has so far been mainly based on copra production aimed at exports and the real industrial approach, namely to process the raw material copra in an efficient local industry in order to convert it into high-value products for immediate consumption, exports or further industrial utilization, has so far not received the industrialists full attention. The raw material 'coconut' has to be transferred into high-value processed goods, namely, edible oil and/or fatty acids and their products, desiccated coconut, protein food and feed products, consumer goods from coconut coir and suitable products from coconut shells. The existing problems in coconut industrialization can only be solved if in the first instance an up-to-date coconut processing industry has been established which makes use of economic processing methods and facilities.

Recognizing this fact, UNIDO recommended the elaboration of a master plan for the development of the coconut processing industry in Ceylon, Indonesia, Papua and New Guinea and the Philippines and other coconut producing countries. UNIDO experts carried out a study of the existing situation of the coconut processing industry in Trinidad which resulted in specific recommendations for industrial development. UNIDO experts have studied the problems involved in coconut coir processing in Thailand and a UNIDO coconut processing economist will be put at the disposal of the Asian Coconut Community in order to assist in its efforts to develop and improve the coconut industry in the ACC member countries.

III. THE INDUSTRIAL APPROACH

Over the past few years UNIDO has received a considerable number of requests for assistance in developing food processing industries in general and vegetable oil industries in particular. UNIDO has, therefore, been in a position to study and evaluate the technical and economic situation in the vegetable oils and fats sector of some of the developing countries. Based on this experience we are of the firm opinion that it is the basic approach towards industrialization which plays a very important role in investment considerations. This basic approach is still a matter of dispute and I would, therefore, like to outline UNIDO's view on the industrial approach as follows.

Many experts, institutes and organizations engaged in industrialization regard the availability of local raw materials as the essential pre-requisite for the establishment of an industry and the most important part of a feasibility study. This approach, according to UNIDO's views, is fundamentally wrong, because the raw materials grown in developing countries, very often on small-scale holdings, are seldom suitable for industrial processing. They are traditionally and primarily destined for sale direct to individual consumers. The raw materials are unsuitable with respect to quantity, quality, variety, price, time of delivery etc., for industrial processing and the production of quality products for sale on the home or overseas markets. The processing industry, however, requires a raw material according to its substantive and commercial specifications which can only very seldom be met by the raw material producers. Should this situation lead to the conclusions "no suitable raw material - therefore no industry"?

We believe that this is not the case. Today, raw material supplies do not primarily provide the economic and starting point for the establishment of food processing industries. The starting point, i.e. the first step in industrial planning, is essentially a detailed and comprehensive analysis of the potential market to ascertain precisely the type, variety, quality, quantity and selling price of the products in demand.

The second step is to be taken by the processing industry which decides on the type and size of plant required to produce the products in demand as revealed by the market study and specifies the quantity, quality and variety of raw materials required and the maximum price that can be paid for them.

The third step is the raw material study stage, on the basis of which the industrialist has to decide on the availability of suitable raw materials and the procurement proceedings involved. These considerations may easily lead to the conclusion that, at least for a preliminary period, imports are not only unavoidable but even profitable. There is, of course, the problem of foreign exchange which has to be duly considered. Problems of foreign exchange should preferably be solved by regional negotiations resulting in the conclusion of relevant regional co-operation agreements of mutual interest and benefit. If preliminary raw material imports are considered it may become necessary to suitably improve and expand the local production of the raw material required by the industry, most probably within the framework of a relevant development programme.

It is an established fact that a viable processing industry is an important stimulant and regulator of the agricultural production of industrial raw materials. It represents the internal market and appropriate contracting systems will give the agricultural production side a high degree of stability and security.

IV. COMMERCIAL TRANSACTIONS AND MARKETING

Experienced vegetable oil producers and processors very often state that vegetable oil production is not an industry but pure business. This is, of course, exaggerated but it is an established fact that current market observations and correctly timed buying and selling activities play an important role in running a vegetable oil factory efficiently. Even the most efficient production process and up-to-date processing technology can hardly compensate for wrongly placed raw material buying orders or incorrectly timed selling actions. This is, of course, a question of management but also, and to a very great extent, a question of available storage facilities which again falls back on appropriate industrial planning. So the circle closes, showing the importance of appropriate industrial planning which has to take into account suitable and sufficient storage and technical processing facilities in connexion with appropriate management on the basis of a well-established commercial production policy.

Detailed market studies and current observations of the internal and external market are of great importance especially in the particular field of the food industry, a special branch of which is the vegetable oil industry.

The international market obeys certain rules and regulations and is rather slow in changing its demands for quality and type of products produced. The price situation, however, reflects the world standard and can only be influenced by large groups of industries and consumers. So it is extremely important for industrial manufacturers engaged in international business to carefully observe the developments in the world market's price structure and act accordingly in executing their commercial transactions.

The local market is generally more straight-forward regarding price developments and in most cases easier to influence. A special price structure is very often created by applying measures of taxes and duties in order to safeguard local industries. The type and quality of products acceptable to the local market, however, is very often extremely difficult. Traditional eating habits and wrong, but well-established, opinions on the food or feed value of products produced are difficult to overcome. Oil cakes, for instance form a high-value protein component for feedstuff production and large quantities are traded in the international market, but there are many developing countries where local farmers refuse to accept oil cakes or extracted meal as cattle feed. In the food sector it is even more difficult to introduce new protein products on an oilseed protein basis in spite of

their nutritive value and an existing protein deficiency. Therefore, it is of great importance to analyse the local market demands very carefully and thoroughly. New products have to be developed according to the traditional eating and feeding habits in use and changes have to be carefully initiated.

UNIDO operations

UNIDO activities in the marketing sector, as outlined above, is always connected with industrial production. UNIDO marketing surveys are, therefore, directed towards and limited to the production of certain industrial goods. I believe it is important to lay stress on this fact as there is a substantive difference between a general market analysis aiming at the improvement of a number of important marketing factors, for example, quality, price structure, packing, sales organization etc., and a market study entirely based on and directed towards the industrial production of a particular product and to be carried out within the framework of an industrial feasibility study. The marketing specialist who has to examine the market situation from the viewpoint of a particular product to be produced by an industrial plant needs to have detailed substantive knowledge of the product and has to be aware of the influence the industrial production technology may or may not have on the quality and composition of the product to be sold. His professional activities will, therefore, have to be closely connected with the industry on behalf of which he carries out his work.

UNIDO vegetable oil experts have carried out a number of market surveys in connexion with industry. A detailed market analysis was carried out in Ghana in connexion with the improvement and reconstruction of existing vegetable oil factories. Additional studies have been made in Dahomey, Rwanda, Togo and other African countries, in Thailand and other countries in Asia and the Far East. Special efforts have been made in the Sudan where a UNIDO expert has organized an oilseed quality control scheme for the improvement of the quality of the oilseeds produced in the country in order to improve exports. An inspection system was legally introduced and three new quality control laboratories established. This project resulted in a considerable increase of the Sudan's oilseed exports and in the development of the local oilseed processing industry, the raw material situation of which is now based on a higher quality level. This project, although primarily directed towards quality improvement, had a great impact on the Sudan's internal and external oilseed market situation.

The industrial approach, as it was outlined above, places the processing industry in the centre of all the activities involved in industrialization. The industry influences raw material production and it also effects the market. It is, therefore, very often the case that a market has to be created for the product to be produced by a newly developed industry. In this connexion I would like to mention the soy-protein food industry. New products have been developed, for example, soya protein concentrates and isolates, textured soy protein, meat-like products and many other soy-protein food combinations. These new products have found a steadily expanding market which not only formed the basis for the development of a new type of the soyabean processing industry but at the same time introduced additional protein food to the world population

V. THE PRODUCTION PROCESS

Each type and variety of oilseed or oil fruit has a typical peculiarity which should receive its due attention in industrial processing. The existing equipment has to be re-adjusted or new equipment added if an additional oilseed variety is to be processed. The use of unsuitable equipment will always result in high production losses, low quality of the products produced and an unfavourable production economy. Instead of producing a product with an added value, in extreme cases, the raw material will just be destroyed.

In this connexion I would like to point out that the application of unsuitable equipment, particularly in small-scale factories, may not necessarily result in financial losses to the owner of such a factory. It may even be profitable in some countries where the internal market price exceeds the actual value of the product produced, which would then be overpaid to the benefit of the producer. However, it will always be a great loss to a country's national economy.

A very important factor for an appropriate production process is the optimum utilization of the raw material and the by-products obtained. It is often the case that the suitable utilization and at the same time revaluation of waste and by-products, for example hulls, linters etc., has, under certain circumstances, a considerable influence on the economic efficiency of the production plant.

The application of an up-to-date process technology is of particular importance in oilseed processing. The equipment used should not require unreasonable labour attendance and manual work should be reduced as much as possible. Continuous plants should be given preference. This is also valid for developing countries where labour is often still inexpensive. An industrial undertaking is bound to be a failure in the long run if it is based on local social views and not on the sound economic grounds of an, at least, average world standard. The oilseed processing industry is an export industry and has to level up with international competition's technique, technology and economy. Therefore, it is generally not advisable to make use of secondhand machinery which is often available on the market at reduced prices. The investment costs of an industrial plant should, therefore, always be seen in relation to the expected production costs. Lower production costs will, in the long run, always justify higher investment costs.

Process supervision and quality control are closely related activities in an oilseed processing plant. It is not sufficient to analyse the end-products before storage or sales and to determine whether or not the product meets with the market

requirements. Raw materials, intermediate products, by-products and end-products should be analysed systematically in order to give the plant supervisor an opportunity to re-adjust certain production parameters if necessary.

The improvement of the quality of the products produced by the vegetable oil industry in developing countries should receive the special attention of importers, exporters, users and consumers and last, but not least, the vegetable oil producer. The vegetable oil industry is an export industry and vegetable oil producers in developing countries will only be able to play their full role in the export market if the products produced by them can steadily and unquestionably compete with the world quality standards. This remains valid to its fullest extent, also if a vegetable oil factory's production is mainly directed towards local consumption. It is the consumer's right to examine the quality of the various products available to him and to select those which suit him best. It will hardly be possible to successfully replace imported goods by locally made products if the quality difference is obvious.

On the request of the Government of Bolivia a UNIDO expert evaluated bids received from various equipment suppliers for a vegetable oil factory to be established on a turn-key basis. It is only natural that those equipment producers whose quotations were not very favourably placed would try to question the substantive evaluation made by the UNIDO expert, which in fact has been the case. I would, however, like to make use of this opportunity to clearly state that the views expressed by UNIDO in connexion with any substantive evaluation will always be limited to a particular project and have no bearing on the capability or competitiveness of any of the firms involved.

VI. THE RAW MATERIAL SUPPLY

The supply of sufficient quantities of oilseed raw materials of an equal standard quality to the processing plant plays a dominating role in vegetable oil industrialization. An industrial scale production plant can never be economically efficient if its raw material supply is not guaranteed by relevant contracts or other suitable arrangements.

A practicable raw material supply basis for the commercial vegetable oil industry would be the direct contracting system between oilseed producer and processor on a long-term contract basis. This system may be considered in a number of developing countries, the commercial transactions and sales proceedings of which would allow the elimination of dealers or middlemen. The direct contracting system, under certain circumstances, may be beneficial for both oilseed producers and processors. It has to be based on two equally strong independent partners, or still better, one of the two partners, namely the processing industry, takes the lead and directs the oilseed producer in all aspects of his production according to the processors requirements. Direction, however, also means support and assistance to be provided to the oilseed producer in many aspects of oilseed cultivation.

The most appropriate system, however, is the combination of oilseed production and processing under one general management. This integrated approach is unavoidable, for example, in the palm oil industry which has to combine industrial estate palm fruit production and processing in order to be economic and competitive.

Appropriate raw material buying proceedings are closely connected with the availability of suitable storage facilities and, what is very often underestimated, with the selection of the most economic but technically suitable transport methods. Oilseed processors should be fully aware of the fact that there is only one, seldom two, harvests of oilseeds and the turnovers, therefore, he can make are limited compared, for example, with vegetable oil refining or margarine production. The oilseed processer will have to make use of favourable opportunities to buy oilseeds in large quantities. However, this means appropriate storage in order to maintain the oilseed quality and to avoid unreasonable losses.

UNIDO operations

During the field work carried out by UNIDO experts in various developing countries it was often discovered that the installed capacity of a technically more-or-less efficient oilseed processing industry remained unutilized because of lack of raw materials. However, the country's total oilseed production by far exceeded the industry's raw material requirements and large quantities of unprocessed oilseeds were exported. Such a situation proves that there is no connexion between oilseed producers and processors and fundamental corrections in the country's internal economic structure would need to be made. A developing country's internal structure is normally based on the traditional activities of the population and has so far established itself in a quite natural way. Following the economic needs priority is now being attached to industrialization, a new activity with its own rules and different requirements. It goes without saying that considerable problems have to be solved in creating the pre-conditions for the establishment and successful development of viable industries in the developing world.

During their field work UNIDO experts are paying special attention to the industrial utilization of oil and fat bearing materials which are not yet fully or at all utilized. It is a question of assessing quantities and the quality of these raw materials in the first instance and probably the establishment of suitable collection and preparation units at a later stage. Whether or not these raw materials justify the establishment of new industries or the development of existing plants can only be answered by a feasibility study. In Chad, for example, considerable amounts of karité nuts remain uncollected, they deteriorate and serve as an animal feed. UNIDO experts are presently engaged in providing the relevant areas with suitable collection and preparation equipment for karité nuts with a view to industrial utilization. Plans are being elaborated for the establishment of suitable karité processing plants.

Considerable amounts of parinarium annamemse seed can be found in the northern parts of Thailand, the collection, preparation and processing of which is at present limited to a few small-scale installations. It is expected that the oil obtained from parinarium annamemse (drying oil) will find a favourable market in Thailand and other East Asian countries.

VII. THE TECHNICAL DEVELOPMENT AND ECONOMIC IMPROVEMENT OF EXISTING VEGETABLE OIL FACTORIES

It is not only the appropriate establishment of new vegetable oil factories which should receive our attention, due importance should also be attached to the development of existing factories and especially the re-organization of technically unsuitable and economically inefficient production units and their transfer into a viable commercial industry. This task opens a wide field of activities for international experts of different professions and qualifications. In order to come to practicable results it may often be necessary to find a combination of both development or existing production facilities and their expansion by new investments.

The development of existing industries meant detailed technical and technological work, engineering aspects have to be considered, raw material transport and storage, labour requirements, energy consumption, quality control activities, investment and production costs, cost accounting, management problems, questions of packing and marketing etc. All the individual assessments made will have to be evaluated in order to draw conclusions and specify action to be taken for an appropriate development. Industrialists in developing countries are not always in a position to carry out this work without the assistance of experienced international specialists who supply them with the necessary know-how and advise them on the substantive problems involved.

UNIDO operations

Experienced UNIDO vegetable oil technologists have been attached to an existing vegetable oil factory in Madagascar. The technical production process was reviewed and evaluated and plans were elaborated for an appropriate expansion of the existing production facilities. The production technology applied in an existing vegetable oil factory in Guinea was studied and the problems of the plant's management and organizational situation was evaluated.

Plans have been made for the establishment of a central quality control laboratory in Guinea as a central organization in charge of quality improvement and process control in the vegetable oil industries sector, the implementation of which is currently in progress.

UNIDO vegetable oil and feedstuff technologists, on the request of the Government of Ceylon, reviewed the technical production process of existing production units which resulted in specific proposals for further development.

Relevant follow-up action is presently being planned by UNIDO and will soon be implemented.

Based on a request received from the Government of Iran, UNIDO edible oil and fatty acid technologists will assist the management of existing oilseed and vegetable oil processing plants in their efforts to develop the production technique and technology and to improve the plant's industrial production economy.

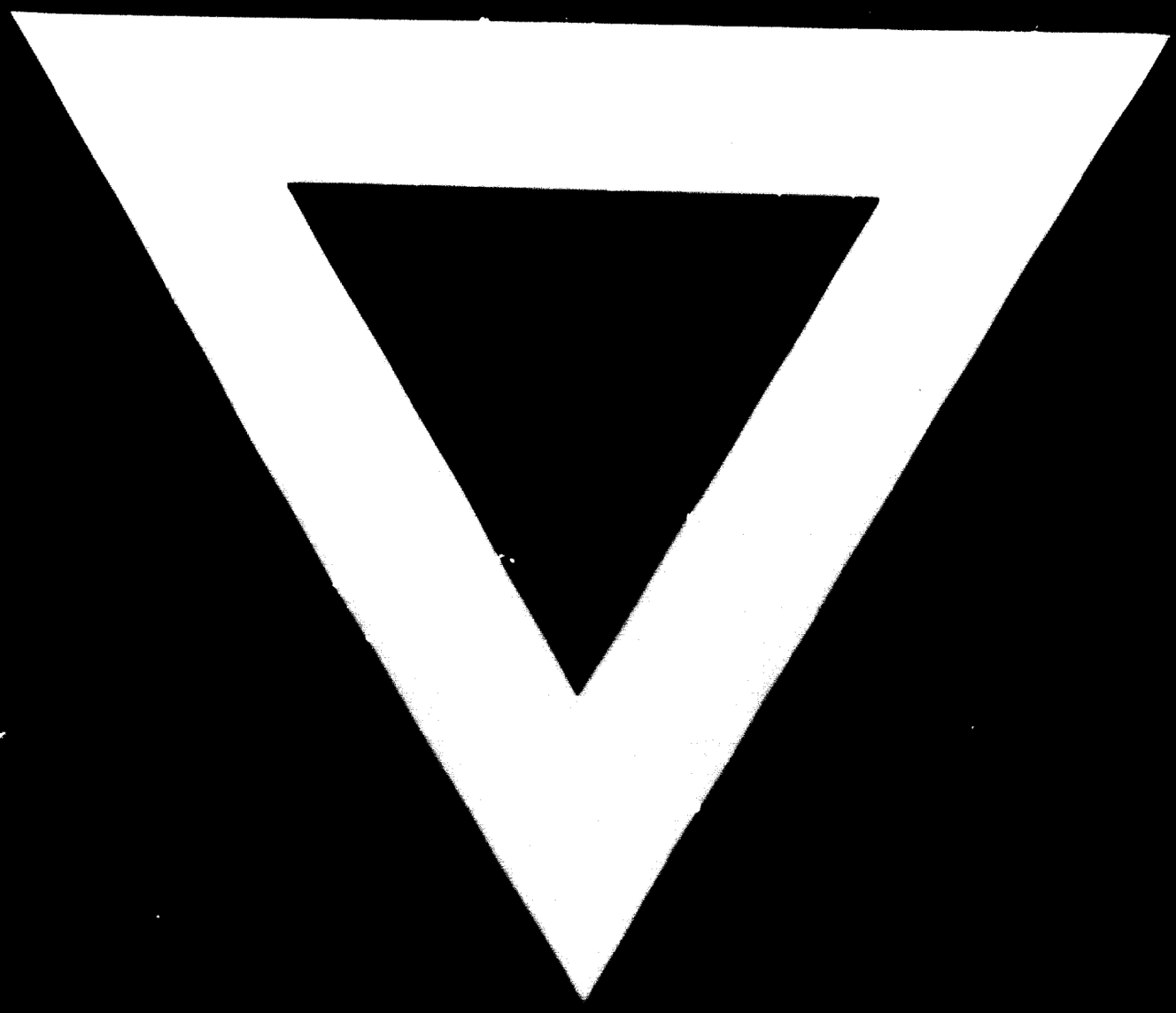
VIII. INTERNATIONAL CO-OPERATION

The development of the international vegetable oil industry is a very rewarding task and a wide field of activities for organizations, institutions and individual experts engaged and interested in this particular branch of the basic food industry. It is not only the establishment and development of industrial processing plants which needs to be sponsored and actively supported, the organizational aspects involved in appropriate industrialization play an important role, the creation of the preconditions necessary for industrial development and last, but not least, the scientific research work to be carried out for product development and quality improvement for vegetable oils and other oilseed products.

It is UNIDO's concern and responsibility to actively assist industrialists and all other governmental and non-governmental organizations in their efforts to build up industries in order to make use of available raw materials and to supply more and better quality goods to the population. Naturally, UNIDO assistance will in the first instance be made available to those who need it most, namely to developing countries. However, UNIDO will only be in a position to effectively assist developing countries if it can make use of the know-how and experience gained and available in the industrialized world. UNIDO, therefore, needs the co-operation of professionally experienced vegetable oil experts, industries and institutes of developed countries in order to successfully carry out its development work.

UNIDO is engaged in international industrial development, it is therefore trying to approach the problems involved in the same business-like, straight-forward way as industry itself is accustomed to. We are fully aware of the fact that real industrial development has to be based on the mutual advantage of both partners, the supplier and the receiver of the know-how involved. The creation of such partnerships is one of the aims of UNIDO's activities and UNIDO's important role as an initiator in sponsoring international co-operation should, therefore, be fully understood and recognized.

This meeting should, therefore, also be seen as an attempt to create such partnerships and to initiate and intensify an exchange of views between internationally acknowledged vegetable oil experts and UNIDO to the benefit of the development of the world-wide vegetable oil industry.



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