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05414

Distr.
LIMITED

ID/WG.171/11
4 April 1974

ORIGINAL: ENGLISH

United Nations Industrial Development Organization

International Consultation on
Agro-Industrial Development

Belgrade, Yugoslavia, 13-18 May, 1974

# SUBSTANTIAL STRUCTURE AS A CRITERION FOR AGRO-INDUSTRIAL DEVELOPMENT 1/

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CONTENTS


| | |
|---|---|
| Introduction | 1 |
| Horizontal integration | 2 |
| Vertical integration | 7 |
| Conditions and efficiency at different levels of integration | 10 |
| The structure of agro-industry | 12 |
| Conclusion | 16 |

# SUBSTANTIAL STRUCTURE AS A CRITERION FOR AGRO-INDUSTRIAL DEVELOPMENT

## Introduction

Agro-industry is a highly integrated business which, as a large scale production, performs all or most of the work of agricultural production, processing, preservation and selling, from the raw material stage to the point of actual use.

A high level of concentration through the integration of agricultural production and food processing makes possible a more rapid development of agriculture by means of transferring up-to-date technology and innovations and, in particular, know-how on the proper utilisation of new techniques and application of appropriate agricultural practices.

With the development of productive forces (machines and equipment; the people utilising them; production; experience and working habits) farms become larger and more specialised. Even if the farm area is the same, with a higher degree of specialisation there is greater concentration of a certain production on the same farm, concentration of a certain production being achieved through horisontal integration.

Vertical integration, however, entails the concentration of separate stages of production and distribution, where each stage yields a saleable commodity: it can be effected either by transfer of ownership or by contractual arrangements.

These two main forms of integration, which are often considered opposites, usually develop concomitantly in the course of economic development and production concentration.

Each of the partners enters into integration on the assumption that under the prevailing circumstances it is the best possible alternative. For this reason, each business organisation must decide the degree to which it will be integrated with the other organisations.

The rapid progress in agriculture in recent years has been attained through production concentration and specialisation and the concomitant

integration of separate enterprises, firstly through horizontal integration. The development of vertical integration is based on a certain level of horizontal integration. When vertical integration is developed, it induces further horizontal integration.

Objectives of the integration of agricultural production and food processing very often are:

i) Harmonization of production programmes and division of labour, particularly on the basis of common technological and economic characteristics of production capacities of integrated organizations;

ii) Joint planning and co-ordination of the production, and better utilization of capacities and market opportunities;

iii) Transfer of commodities and services from one unit to another (avoiding markets), and their utilization in successive production stages to final products.

iv) Joint research and development and establishment of internal standards to ensure smooth running of successive production stages;

v) Joint use of production factors, licences, and other possibilities of integrated organizations.

vi) Joint procurement and sale of commodities.

vii) Joint programming of development, joint investments policy aiming at optimization of income and decrease of unit costs per product to the benefit of all partners;

viii) Organization of joint services (accounting, transportation, financing, etc.) to the benefit of integrated organizations;

ix) Joint training of staff and workers;

x) Joint presentation of interests of integrated organizations in the agro-industrial sector to governmental and other bodies formulating economic policies.

Horizontal integration

The main factors which influence horizontal integration through their effect upon optimum farm sizes are:

i) Actual economic and social relationships, which are very important

for the concentration and centralization of agricultural production.

ii) Economic, technical, and cultural development the higher the development is, the more possibilities there are for better exploitation of the advantages offered by large-scale agricultural production

iii) Development and improvement of the technology of agricultural production.

iv) Development and improvement of transportation facilities, the organization of a large-scale agricultural production being much easier when transportation facilities are developed.

v) Level of economic efficiency, which is usually higher in large-scale agricultural production.

vi) Modern large-scale agricultural production requires better qualified staff and workers, but uses them more efficiently.

vii) The trend towards higher living standards is also a trend towards large-scale agricultural production.

viii) There are various possibilities for horizontal integration in agricultural production, depending on natural conditions.

ix) The degree of intensity is also governed by the size of farm, and the development of horizontal integration.

x) Adoption of innovations and new knowledge necessary for agricultural development and improvement is easier in large-scale agricultural enterprises.

The optimum size of a farm is a major problem which has been discussed by farm organization and management experts for many years. The tendency now is, for many reasons, to shift from smaller to larger farms, even to large-scale highly intensive complexes or farms. Small family farms become more and more additional sources of income for people engaged in industry and other non-agricultural activities. Results of analyses in most countries show that the tendency towards larger farming is reasonable. The problem is establishing the optimum size of a farm for certain social, economic and natural conditions. If the size of a farming is measured in terms of gross returns or the production of commodities, which is often better, the major influence is the efficiency with which the factors of production have been employed and the level of intensity.

In Yugoslavia, eighty-five per cent of the cultivated land is under small family farms,[1] which are no larger than ten hectares (nearly 25 acres) of arable land. The large social agro-industrial enterprises, managed by workers and employees engaged on the farm, cover only fifteen per cent of the cultivated land, yet their participation in total agricultural production is thirty per cent and in marketed production forty-seven per cent.

Part-time family farms (one or more members of family permanently employed outside the farm) possess nearly forty per cent of the private farm land. These farms are an additional source of income to their owners.

The share of family farms larger than 5 hectares (12.5 acres) in the total number of family farms is nearly thirty per cent, in the total land belonging to family farms sixty per cent and in total marketed produce from family farms seventy per cent.

The co-operative societies, agro-industrial combines and other social enterprises have developed various forms of collaboration ("co-operation") with family farms. This leads to a large concentration of production, and to specialization in large areas, or to further horizontal integration.

Experience in Yugoslavia, as well as in many other countries, shows that the development of productive forces and techniques enables the producers today to organize a truly large, "industrially" organized production, even in agriculture. New methods are being used in farm organization and management, crops and animal husbandry, which increase the farms' capacity and efficiency, and decrease the cost of production. But experience also shows that new organizations of produotion with new techniques and practices can be realized only on large farms. For that reason, there is a tendency to enlarge the size of the farm. During the last decade, the number and size of social farms in Yugoslavia changed as follows:

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[1] Usually called "private"farms , "individual" farms or "peasant" farms.

| Year | Number of farms | Average size in ha. (2.5 acres) |
|---|---|---|
| 1961 | 469 | 1,907 |
| 1972 | 293 | 5,062 |

Yugoslav experience shows that large-scale agricultural production provides various advantages which are not to be found on small family farms. The crop yields per hectare achieved by social farms and through production collaboration in the last ten years exceed the average Yugoslav yields attained by farmers who did not collaborate with social agricultural organizations.

Our experience as well as the experience of developed countries also prove that a large agricultural farm does not feature large acreages only, but also qualified staff, modern means of production and up-to-date production practices. High investments are thus needed. In view of the shortage of investment funds, we found it better to use the funds for a small number of large farms, than otherwise. In this way, savings and production increase faster and experience is gained for the further expansion of large scale "industrialized" agricultural production.

Better results per land unit under the same natural conditions are very important factors for the further concentration of production on big farms, and for popularizing different forms of large-scale production through collaboration between social agricultural organizations and farmers.

Horizontal integration in Yugoslav agriculture has been effected hitherto more through large farms and different forms of large-scale production, than through further specialization.

Specialization is essential to further concentration of a certain production, i.e. for horizontal integration. There are many reasons and conditions influencing specialization. Most important are:

i) Soil, climate and other natural conditions, which often favour certain crops.

ii) It is much easier to adopt technology for one or a small number of crops. If skills are lower, agricultural production can be increased through specialization in production.

iii) Skilled workers can be more easily found for a limited number of procedures, the requisite skills can be acquired much faster.

iv) It is much easier to organize a large specialized unit than a mixed farm. Specialization thus becomes a means of enlarging a farm, or a developing horizontal integration.

v) Market surveys for a limited number of commodities can be organized more easily and effectively.

vi) Agricultural machines are more and more specialized, a more efficient utilization factor is possible in large-scale production.

vii) Development of food processing in certain areas influences specialization in agricultural production.

viii) Changes in consumer preferences are often a reason for specialization; factories near new cities register an increasing demand for milk, vegetables, and other bulk products.

ix) General economic and agricultural policy can be designed to stimulate specialization, through price ratio, taxes, different credit terms, import-export tariffs etc.

x) If transportation facilities are more developed, there are greater possibilities for specialized, completely market-oriented production.

There are also some weaknesses in specialized production. Most important are the risks and seasonal labour. Under the actual conditions of large scale production, some of these problems can be solved, mostly by means of fuller mechanization. The development of agro-industry is very important in solving the risk problem. The whole activity of a highly integrated organization is directed towards the benefit of all its members.

A highly integrated, large-scale agro-industrial organization has many possibilities of enjoying the advantages of specialized production in its basic organizations of agricultural production and food processing; it also has the advantage of combined production within the whole integrated organization.

Vertical integration

It is usual to differentiate between the main forms of vertical integration: ownership of complementary enterprises (the traditional concept of vertical integration) and the various contractual arrangements which, as is well known, have rapidly spread to different farm enterprises (broiler production, stock-fattening, milk, sugar beet, tobacco, hops, oil plants, fruit, grapes, vegetables and many other types of production).

In a right sense, it has become common practice to describe vertical integration as the full centralization and co-ordination of decision-making processes through single ownership of the enterprises in different stages of production and distribution. Vertical integration, on the other hand, may include various integrative contractual arrangements, through which, over and above the concentration of ownership, there is the temporary acceptance of mutual obligations by independent businesses. The management may be based on participation, instead of full concentration of ownership.

These two forms of vertical integration are sometimes used by one company at one and the same time, the tendency being to eliminate any difference, and to proceed, whenever possible, to vertical integration through common ownership, government and control.

Both the common ownership of complementary enterprises and production contractual arrangements imply that commodities are transferred from one unit to another without market interference. In this sense, they both represent closer contact between firms, than momentary contacts in an open market. Competition is declining even with contractual arrangements, because it takes place solely prior to the signing of contracts.

There are many different variants of vertical integration, from full vertical integration when business transactions are terminated within the integrated complex, such as the chain involving feed-factory - stockfattening - slaughterhouse - meat packing - cold storage - wholesale dealer - retail dealer, to the variants of vertical integration, where only some of the successive stages of production and distribution are

included. The division of production into stages should correspond to those critical points where market purchases or sales are realistic and reasonable from the standpoint of the individual members. These are the stages of production which yield saleable commodities.

Vertical integration has passed through different phases from the standpoint of the benefit to be gained by partners. Previously, many contractual arrangements meant that the producer and dealer simply agreed on certain provisions, but the producer bore the production risk. Today contracts are drawn up where the producer no longer bears the full production risk. The whole control inside a large organization and decision-making process is not directed towards the sole benefit of any separate unit, but rather towards the benefit of the organization as a whole i.e. all its parts.

With improved food standardization, collaboration between producers of raw materials, processors and tradesmen is increasingly necessary. Production of the means of production, production of agricultural raw materials, their processing, wholesale, and retailing are only different phases in the chain of vertical integration.

Industries which produce various means for agricultural production are interested in a higher consumption of their products. Agricultural producers may not be economically interested in such a development or may lack the technical and financial resources to conduct the necessary investments. As a result the company which produces feed, seeds, fertilizers, fungicides, insecticides, and many other materials used in agricultural production must of itself assist the development of the respective farms, their prospective consumers. Development of dryfeed lots and broiler farms has been assisted by the manufacturers of feed mixtures. Producers of many other materials have promoted the development of respective agricultural products, in one way or another, which very often results in various types of vertical integration.

To ensure the full utilization of a certain line in the processing sector, a specific quantity of a standard-quality agricultural product is needed. Thus, it is necessary to establish control of the source of supply or of the distribution outlet, and secure control of the quality of

raw materials.

The quality of raw materials is difficult and costly to test, and they are not easily replaceable. Hence, some industries are concerned with the care and skill with which raw materials are produced on farms.

Some industries are interested in promoting the supply of new materials either to produce a new product, or to substitute raw materials already used.

In order to sell an agricultural product, it is necessary to prepare it for the market by sorting, packaging or processing. The preparation of agricultural products for the market is done increasingly in an industrial way; this means integration is required.

Major processing companies are better equipped to organize the wholesale and retail of their products. They can establish direct contact with the consumers and, thus, reduce marketing costs.

Introducing a new technology in agricultural production requires some additional means of production. Experience shows that a better use of disposable sources of credits is possible, if loans are used by larger vertically integrated companies. Loans are used in this case firstly to remove bottle-necks and to develop the most profitable units within the production and distribution sectors.

Today, with the rapid development of technology and its more intensive use as well as full mechanization and the automation of production, the number of highly skilled agricultural producers is increasing at the expense of the traditional farmer. This is quite understandable. The even greater development of productive forces, and especially the use of modern means of production, requires an even greater training of those using them.

The integrated company or association has an added responsibility to provide agricultural producers with means of developing their abilities and talents to the benefit of both the integrated company and themselves.

For all the members of the integrated company or association, a major benefit is the reduction of losses or stabilization of income over time, permitting the investment of the company's savings in other successive stages. It is always possible and very often necessary to optimize final results, even if revenue calculations and the income of the separate units do not show good results in relative terms. Such a policy may help the company to meet the price competition at one stage by subsidies from another stage, where larger profit margins are obtained.

Through vertical integration, it is possible to exploit technical complementarity between the successive processes in an uninterrupted flow of materials from one process to another in terms of costs and labour saving, thus reducing the unit cost of production.

In some industries concerned with the processing of agricultural products, the busiest time is late autumn and winter, thus more labour can be employed during the vegetation period and in the off-season to work in the processing plants.

Integration is not an aim in itself, but a way towards economic growth and benefits for all members of the integrated organization. The methods and level of integration depend on the prevalent conditions. Different levels of development at certain periods of time, in certain regions, determine the most reasonable types of integration. It is always necessary to bear such problems in mind as how far vertical integration is likely to spread in the production of a particular food item, or what consideration the agricultural producer should give to deciding the degree of horizontal and vertical integration.

## Conditions and efficiency at different levels of integration

The objectives of some of our investigations were to find the influence of different levels of integration on the efficiency of agricultural and industrial enterprises. All investigated enterprises were grouped according to the level of integration (agro-industrial enterprises, social farms, co-operatives, and food industry outside the agro-industrial enterprises), and conditions and efficiency were

investigated for each group of enterprises.

On the basis of our investigations, better conditions for higher efficiency are to be observed as the level of integration increases. Some average conditions for the period 1965-1970 were:

| Conditions | Agro-industry | Social farms | Co-operatives | Food industry |
|---|---|---|---|---|
| Average size of enterprise in ha. of total area | 8,530 | 3,869 | 3,265 | - |
| Arable land in ha per enterprise | 5,950 | 2,746 | 2,566 | |
| Cash receipts in 000,000 Dinars per enterprise | 192 | 28 | 47 | 131 |
| Machinery and equipment per worker in 000 Dinars | 13.0 | 11.6 | 8.4 | 19.7 |
| Inputs per worker in 000 Dinars | 87.1 | 36.6 | 67.2 | 154.4 |
| Multiple correlation between inputs and cash receipts | 1.00 | 0.96 | 0.98 | 0.99 |
| Multiple correlation between inputs and income | 0.99 | 0.58 | 0.78 | 0.99 |

As a result of these better conditions from higher levels of integration, efficiency improves as well. Some of the average results of the estates with different levels of integration for the period 1965-1970 were:

| Efficiency | Agro-industry | Social farms | Co-operatives | Food industry |
|---|---|---|---|---|
| Cash receipts per 100 D of wages and salaries | 710.8 | 432.6 | 540.7 | 1,135.1 |
| Per ha in 000 Dinars: | | | | |
| Cash receipts | 23.0 | 7.3 | 11.1 | - |
| Income | 4.8 | 2.6 | 3.2 | - |
| Profit | 0.7 | 0.6 | 0.8 | - |
| Contributions, taxes, etc. | 2.2 | 1.1 | 1.3 | - |
| Average increasing rate of: | | | | |
| Cash receipts | 26.4 | 3.8 | 6.3 | 24.1 |
| Income | 24.6 | 1.0 | 6.9 | 20.3 |
| Profit | 3.6 | 0.9 | 0.9 | 0.4 |

On the basis of the investigations, it may be said that a tendency to higher levels of integration is reasonable, efficient, and profitable. With a higher level of integration there is better utilization of existing resources. There are many possibilities for further horizontal and vertical integration. It is necessary to make further investigations to find the best possible level of integration for certain conditions in a given area.

The structure of agro-industry

Since there are many different reasons for mutual co-operation and co-ordination through vertical integration between agriculture and the industry processing agricultural raw materials, as well as the industry producing the means of production for agriculture, the same industries may very often be the initiators of vertical integration. If agriculture is the initiator the organization founded is termed agro-industrial; if industry is the initiator, the new organization is known as an industro-agricultural combine.

In some cases, vertical integration is promoted by trade or banking organizations as a means of promoting their own businesser more efficiently. Cities or states can initiate vertically integrated projects to improve their food supplies or possibly exports.

Depending on the initiator, there are different structures of agro-industrial organizations. The concept of structure in organisations is fundamental, structurebeing a particular system of arrangements, a pattern or network of relations between various positions as well as among the holders of such positions.

Organizational structure is not accidental. The responsible bodies have to find a structure best suited to the organization's needs, as the relationships constituting the formal structure are created and defined through the formulation of business policy.

Over the years, business participants, observers, managers and research workers have developed a number of principles concerning the organizations' structure. The existence of levels is always characteristic

of an organized and co-ordinated organization's effort. The basic idea of a scale is that it grades or distributes a characteristic over a series of clearly defined units. In agro-industrial organizations the levels represent the different phases of business activity. The work in an organization is distributed among the levels through basic organizations or units thereof

Distribution and marketing have to be co-ordinated with the agricultural production. The flow of inputs from the domestic market or abroad, and the flow of products to the market have to be organized at the very outset. When planning a new agro-industrial organization, it is necessary to start with the organization of the distribution and marketing channels. However, since in many cases agricultural production has already started, distribution and marketing has to be organized as a first step in promotion.

Assuming preprocessing to be farm operation (cottage cheese, butter, wine, brandy, smoked ham, sausages etc.), levels 1, 2, and 3 (diagram 2) are usually organized as a well developed farm. In any event, they are the first complex group of activities in any well planned development of a certain area or farming group. Vertical development must be based on a certain standard of development in levels 1, 2 and 3 (diagram 2).

International capital prefers to proceed directly to level 4 and 5 (diagram 2) in particular the latter stage. However, it may prove difficult to achieve full efficiencies at level 5, or levels 4 and 5, if levels 1, 2 and 3 have not been adequately developed in the earlier period of development. In order to achieve better co-ordination and co-operation, international capital must start at levels 1, 2 and 3, particularly in developing countries. After a certain level of development (horizontal integration) is attained, agro-industry as a vertical integration will develop more rapidly and successfully.

Distribution of an organization's units at the same level is the process by which an organization expands horizontally. This procedure establishes the units of a business enterprise in a horizontal direction ensuring the successful performance of rational and complementary business activities.

Figure 1.

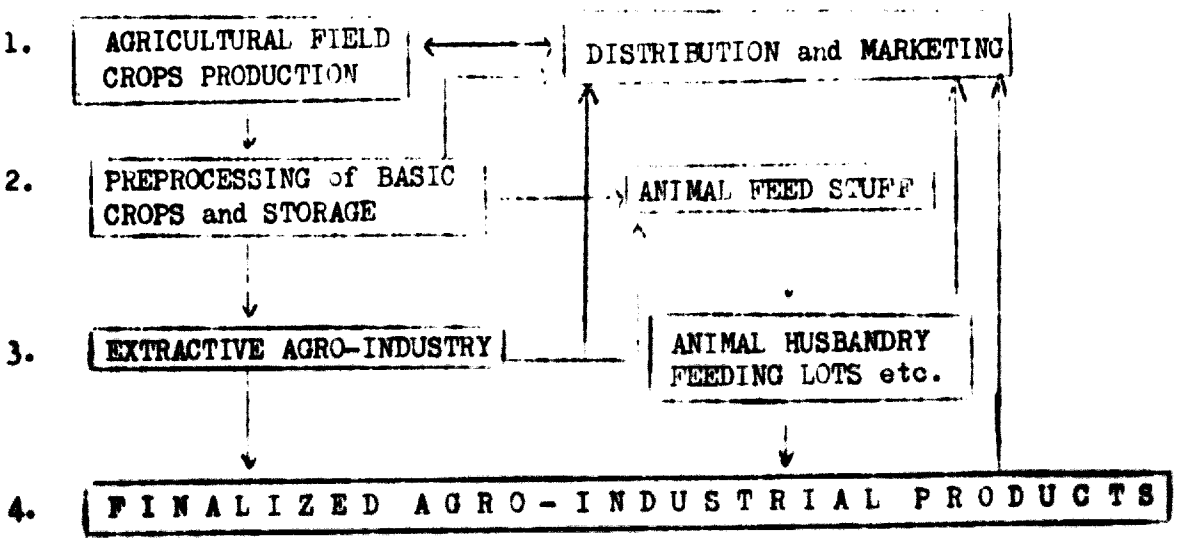
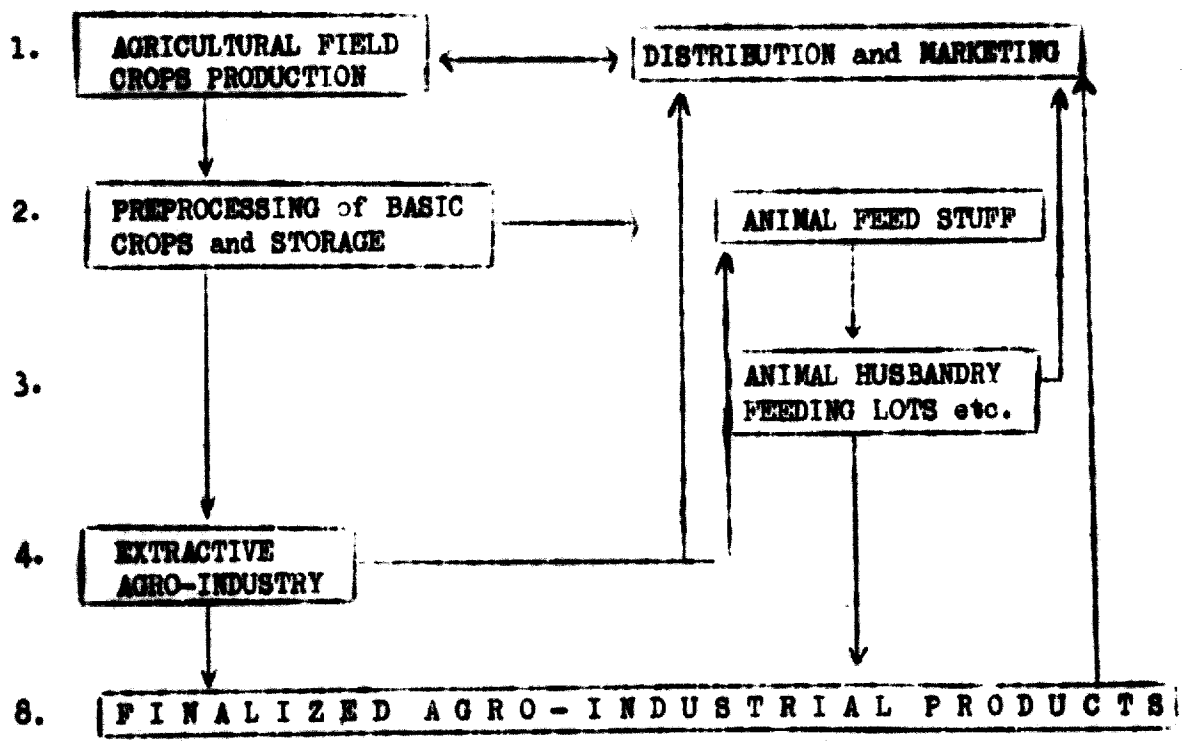



Figure 2.



As a business grows in size and complexity, as is usual in agro-industrial organizations, additional organizational units may be established. This occurs as new business activities previously deemed unnecessary become desirable or the need arises for geographical or territorial reasons. As agro-industrial companies grow, they find it desirable to split their activities among organizational units away from the main centre of their operations.

In order to develop an adequate programme of business activities, the agro-industrial companies may divide the activities of their organizations into groups according to territory, community, region, or specific market location. The agro-industrial organizations must develop the units of a business enterprise in a horizontal and vertical direction and take into full consideration land configurations, climatic conditions, sources of agricultural products for processing, organization of transportation, storage, sales outlets, etc.

The term decentralization is used to refer both to the physical location of facilities and to the degree to which decision-making responsibilities are dispersed throughout the organization. The decentralization of agro-industry is one of the basic forces operating in agro-industrial business today. The factors underlying this outward movement of agro-industry include the need to move toward the raw material supply, energy sources, and the centres of population. Companies tend to decentralize in order to secure improved labour and market conditions, lower shipping and transportation costs, better tax situations, and other economic benefits.

There are different integral variants for the expansion of each level of agro-industry. Mergers, amalgamations, various contractual arrangements, business and technical co-operation, co-ordination of different parts of business activities are some means used to achieve horizontal integration at different stages or phases, at different levels of agro-industry. Each partner expects to achieve the advantages of integration mentioned above. Organization is much more stable if the means of production are linked for a longer term.

Different forms of agro-industrial organization are the outcome of

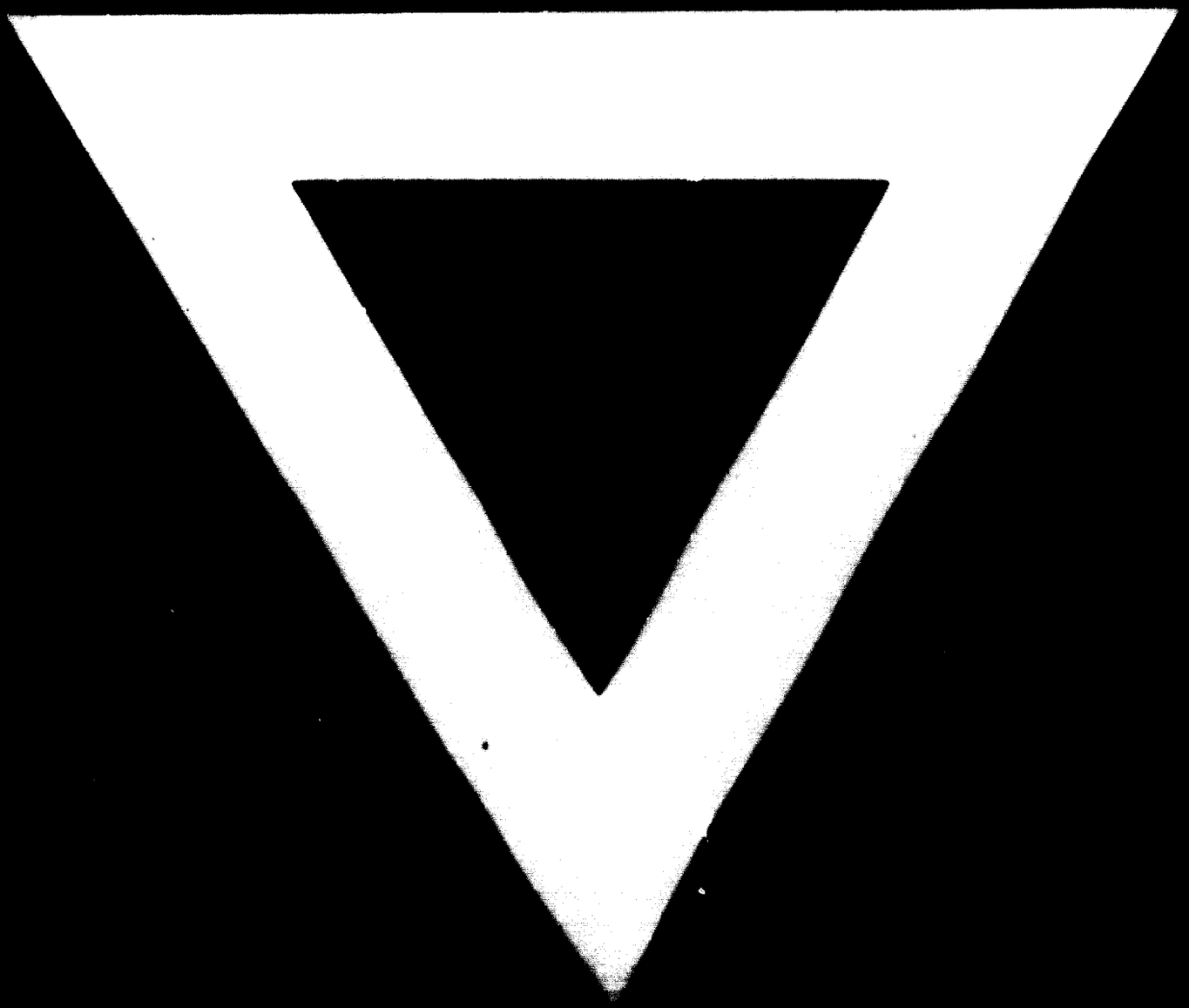
different ways of vertical integration. In Yugoslavia the "combinat" is mostly an agro-industrial, vertically integrated organization founded by the basic organizations specialized through horizontal integration in a certain phase of agricultural production or food processing.

Associations of such agro-industrial, vertically integrated organisations are founded by organizations concerned with various stages or phases of agro-industry, each of which is engaged in basic specialized operations. Members of such associations enjoy greater independence than the "combinat", but run greater business risks.

## Conclusion

Integration is not an aim in itself, but a way towards economic growth and benefit for all members of the integrated organisation. The methods and levels of integration depend on the prevailing conditions. Different levels of development at specific periods of time in specific regions determine the most reasonable types of integration. It is always necessary to bear in mind how far vertical integration is likely to spread in the production of a particular food item, or the consideration agricultural producers should recognise in deciding on the degree of horisontal specialization and vertical integration.

A close co-ordination of policy and science through the mechanism of social planning is very important to the stimulation of the development of large integrated systems of agricultural production and food processing.



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