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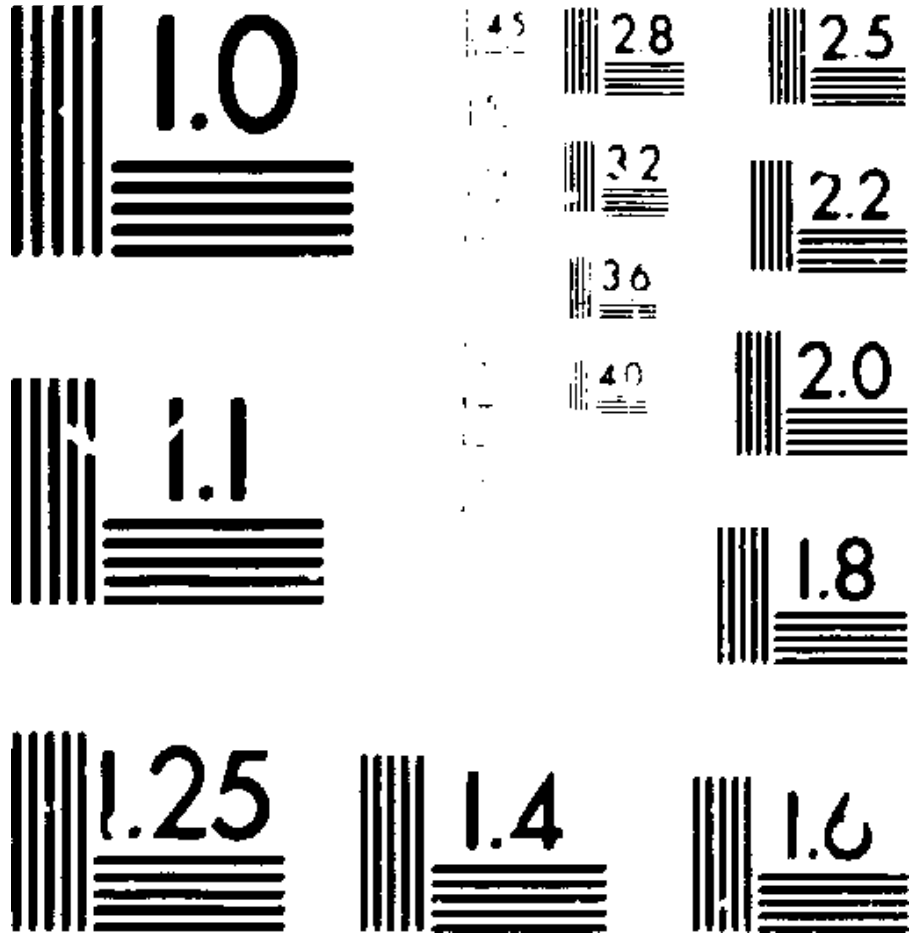

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A DIFFERENTIATED APPROACH TO THE INDUSTRIALIZATION OF THE AGRO-FOOD SECTOR IN THE DEVELOPING COUNTRIES */

Background Paper

by

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Key Points of the Paper

A. Food industries are structured and expand on the basis of a close relationship with the rural environment and with national agriculture. This relationship is extended as new sources of supply become accessible (sections 1.3, 1.4 and 3.2).

B. The growth of the agro-food sector is accompanied by product diversification and by an extension of commercial activity in the direction of the manufacturing of processed foods, close to the centres of distribution and consumption (sections 1.1, 2.3 and 3.1).

C. The industrialization of food processing has brought with it a reduction in craft-type activities, the dispersal of production units and a standardization of methods at the international level (sections 1.3, 1.4 and 3.2).

D. The food industries are becoming increasingly closely linked to the patterns of urban food consumption. These consumption patterns determine which production lines are maintained, where they are located and how they are marketed (sections 1.2, 2.2 and 3.3).

The food industries are becoming recognized as a major factor in the industrial activities of most industrialized or developing countries. In the manufacturing sector, these industries account for a substantial portion of employment, the large number of enterprises involved reflecting a sectoral concentration slightly lower than the national averages.

In the developing countries as in the industrialized countries, the food industries are making a decisive contribution to the quantitative and qualitative improvement of diets through a transformation process which involves three aspects:

(i) The physical transformation of the products, by division, processing or recombination;

(ii) The relocation (transformation in space) of rural products towards urban areas and from one region of the country to another;

(iii) The transformation of the products in time, making it possible to moderate the seasonal fluctuations in agricultural production.

On the other hand, the structural dynamics and the recent evolution of the food industries in the industrialized countries have differed markedly from parallel developments in the developing countries:

(i) While the indicators for the growth of production appear distinctly higher in the developing countries over the period 1970-1980, wage and productivity increases have been more favourable in the industrialized countries. For example, in the developing countries wages grew by 2.2 per cent annually during the period 1970-1980 as opposed to 2.7 in the industrialized countries, and productivity by 2 per cent as opposed to 2.6 per cent. These figures reveal a trend towards the intensification of capital accumulation in the industrialized countries. What one finds, in effect, is that capital intensity increased by 2.5 per cent from 1970 to 1978 in the industrialized countries as opposed to 1.9 per cent in the developing countries. 1/

(ii) The most alarming indicators, however, are those which refer to the relationship of the food industries of the developing countries to the overall economic and social structures of these countries. While the consumption level (apparent average per capita consumption) in developing countries remains far below that of the industrialized nations, the food industries are experiencing greater difficulties than in the past in satisfying national demand and, as a consequence, there is a general trend towards higher imports, as shown in the following table:

All food products	Production/consumption ratio		Import/consumption ratio	
	1970-1972	1976-1978	1970-1972	1976-1978
Developed market-economy countries	1.14	1.26	0.15	0.17
Developing countries	1.00	0.95	0.19	0.22

1/ UNIDO. Industry in a Changing World. United Nations, New York, 1983.

There are a number of possible explanations for these phenomena, but in this report we shall limit ourselves to considering the demographic and socio-food constraints, as well as the specific structural dynamics in the food industries of the developing countries.

1. THE INDUSTRIAL DYNAMICS OF THE AGRO-FOOD SECTOR: THE CASE OF THE INDUSTRIALIZED DEVELOPED COUNTRIES

1.1 Diversified industries partitioned off into production branches

The three principal branches (meat, milk, and grains and cereals) account for approximately 60 per cent of food-processing activities measured in terms of employment or business volume. This share amounts to 25 per cent for the processing of fruits and vegetables, the sugar branch and the production of beverages and alcohols.

In addition to an approach under which the branches are partitioned vertically according to the agricultural products processed, it is also well to consider the structure of the processing levels. This structure is largely responsible for the operating logic of the firms (the position of the co-operative sector), the forms of enterprises (activity slots for small and medium-scale enterprises) and the industrial performance (value added and profitability), as well as for the constraints which bear on production (supply, capital intensity, fragility of products).

At the level of the preliminary processing of agricultural products (sorting and packaging of fruits, eggs, etc.) and, to a large measure, at the level of primary processing, food industries are closely linked to agriculture. This situation justifies the development of the co-operative sector, which has provided the basis for the industrialization of a large range of food activities in the European countries (dairy production, milling, slaughtering, poultry-raising). Co-operative groups have today taken their place among the largest national food firms in Denmark, France and the Netherlands.

If one excepts the immediate preliminary processing of agricultural products, one finds that the primary processing level is the one which requires the tying up of the largest amounts of capital, both for the processing and the storage of the products. Economies of scale are important here and they tend to restrict the available options as to the size of efficient production units.

At the secondary processing level, it is possible, on the basis of the industrial links, performance and strategies of the firms, to distinguish two areas of activity with different growth characteristics:

(i) The secondary processing of traditional products (canning, cheese-making, salting, etc.) makes it possible to maintain independent small and medium-sized enterprises. Innovation in the product area is very limited, and the new techniques are less dependent on the economies of scale. In effect, the capacity of the installations is less of a determining factor than considerations of manual labour, trade mark and product marketing. However, the investment burden and the amount of capital locked up in the enterprise - which continued to be moderate at the time when operations were still capital-intensive - are beginning to increase rapidly as a result of the more systematic mechanization of production processes.

(ii) The secondary processing of more highly processed products is increasingly coming to be a privileged redeployment pursuit of the large national and multinational companies. These firms are encouraged to invest in such activities as children's foods, prepared freeze-dried dishes, milk products and fresh desserts. In this area, the firms are ensured of a financial return higher than what they can achieve in the production of more common mass-consumption items, and they can profit from the obstacles to entry into this market where, because of the need for a mastery of sophisticated production processes and an intensive research and development effort, they enjoy an advantage.

The importance of the value added at this stage of processing is accompanied by a relatively lower investment rate than at the primary processing level. The fact is that the flexibility of the production apparatus makes possible intensive and continuous use of the facilities so as to turn out a range of products for which storage problems are alleviated by a system of rapid distribution.

1.2 Production dynamics adapted to consumption which is quantitatively stable but qualitatively evolving

In the developed countries, the growth of consumption has slowed since the beginning of the 1970s. Approximately 4 per cent a year during the 1960s, the growth rate fell to 2 per cent in France after 1974, and similar trends can be observed in the other European countries as well.

Accordingly, the rapid growth achieved in certain food-processing activities has co-existed with production areas in which there has been only very limited growth and even decline. The new food consumption patterns are the result of social changes and, in particular, increased work by women, the habit of dining outside the home and the new consumers themselves (young people and elderly persons).

In the European countries, the proportion of the household budget set aside for food consumption has been steadily declining over the last 30 years. Depending on the basis of calculation, the budgetary factor for food consumption is close to 40 per cent or even 30 per cent (including beverages and tobacco).

Budgetary factor of food consumption in several European countries

	Federal Republic of Germany	United Kingdom	France	Italy
1950	35	32	39	49
1970	24	32	28	39
1978	21	31	25	36

The structure of this consumption has changed in the direction of more highly-processed products, richer products or products which are regarded as conferring greater prestige. In France, for example, one has observed an increase in the consumption of fresh dairy products, fruits, meat-based processed foods and industrially produced pastry items, in proportions which, over a ten-year period, range from 20 to 50 per cent. The share of processed products is increasing in the diets of the developed countries, whether in the case of fruits, for which the EEC countries are approaching the level of 10 kg per capita consumption (the United States is already at 26 kg per inhabitant), or in the area of frozen foods, the consumption of which has nearly doubled in the EEC over the last ten years.

If one disregards national cultural differences, the nutritional structure of the industrialized countries is fairly uniform: despite some variation in per capita revenue from one country to another, the level of per capita caloric intake per day exceeds 3,500 grams and the protein intake ranges around 100 grams, this protein being principally animal protein in all the countries considered.

Nutrition in several European countries in 1980

	GNP/inhabitant	Calories/ inhabitant	Total proteins (a)	Animal proteins (b)	Ratio (b/a)
Denmark	13 120	3 500	99.3	68.3	66.8
Spain	5 640	3 300	97.2	50.8	64.2
France	12 190	3 400	105.3	67.6	52.3
Hungary	2 100	3 530	94.3	48.3	51.2
Czechoslovakia	-	3 470	98.8	58.7	59.4

1.3 The internationalization of the agro-food sector of the industrialized countries

(a) Since the end of the 1970s, the developed countries have continued to increase their share of world exports of processed food products, while the relative level of their imports has remained stable vis-à-vis the other groups of countries. At the same time, the trend towards a larger share of world imports on the part of the developed countries has been consolidated.

The developed countries, essentially those with a market economy, conduct 80 per cent of their trading with countries of the same group. However, the rising food requirements of the developing countries have expanded the international market for certain products - such basic commodities as cereals (for human consumption), but also milk products and products associated with the "oilseed-animal protein" sector, animal feeds, meats, etc.

On the other hand the developed countries have made themselves more autonomous in the commodity area (sugar, oilseeds, etc.), while at the same time becoming increasingly indispensable to the countries which suffer from structural food deficits (e.g., the petroleum-exporting countries, but also countries in which the agricultural sector has not been modernized).

(b) The rising share of exported production (in France the export rate doubled between 1970 and 1982) has been accompanied by greater interest on the part of the agro-food companies in technology transfer operations. This phenomenon has affected all types of enterprises, at various levels of activity in the food-processing area. Within a context of industrial financing crisis, and in the face of the restrictive policies adopted by the developing countries, the food firms of the industrialized countries have often preferred to expand their activities towards the sale of technology rather than to set up businesses (even under joint venture arrangements) in the developing countries. This strategy creates no handicaps with respect to the further possibilities for obtaining supplies of semiprocessed products from these countries, in addition to which it prevents the tying up of larger amounts of capital.

(i) In the primary processing area, the flour-milling and sugar-refining enterprises have shown interest in engineering consultancy operations in the developing countries, particularly in the form of turnkey projects, and also in the renovation and modernization of installations.

(ii) With respect to the more highly processed food products, the strategies of national autonomous industrialization have favoured technical co-operation agreements - rather than agreements for the installation of industrial facilities - between developing countries with the companies of the developed nations.

This is true of the production of dairy products, food pastes, fruit juices and beverages.

These agreements have taken the form of the sale of licences and processes and also of assistance in the start-up of facilities and vocational training. The companies based in European countries have been particularly active in this area: for example, Italian firms in the processing of fruits and vegetables and the secondary processing of cereals, large French firms in fresh milk products and Norwegian companies in fish-processing.

1.4 Some information on the industrialization process in the agro-food sector

The analysis of the contemporary evolution of the food industries of the developed countries makes it possible to draw a number of useful conclusions for the strategies of the developing countries.

(i) It appears that the food industries are cutting back their privileged links with the regional agricultural systems to which they owe their origin in the face of increasingly expanding industrialization and internationalization. This phenomenon is particularly clear in the case of the secondary processing industries and, above all, in the production of more highly processed food products. Adaptation to the requirements of urban markets has brought with it a relocation of enterprises, which are less and less often being built in rural areas. Thus, at the limit, the oilseed-animal protein sector might be found to be integrated independently of the traditional agricultural or rural structure, and in a close relationship with major urban consumption centres. Moreover, the companies are tending to give preference to those activities which bring a high level of value added (not necessarily the areas which are most effective in nutritional terms) and to diversify into activities outside the food sector, a development which may contribute to a drainage of agricultural surpluses.

(ii) The growth of food-processing firms in the industrialized countries, in a context of stagnating national demand, has been accompanied both by a concentration of production (with a small number of firms enjoying predominant control over the market for a given product) and also by an international opening up of trade. This last factor manifests itself in two ways: in the first place, in the rising proportion of exported output and, in the second, in the increasing role of imported semiprocessed products or products which have undergone only simple primary processing.

(iii) The food industries of the developed countries are becoming increasingly capital-intensive and are no longer sources of employment. Modern industrialization aims at the intensification of production, primarily through continuous processes and the elimination of the disruptions due to human intervention, even at the quality control and maintenance stage. These intensive production techniques are increasingly being regarded as reference standards and are transmitted to the developing countries through equipment sales and, in particular, through the sale of "turnkey" facilities. Thus, the integrated nature of the oilseed-animal protein sector leads to an interdependence of production and processing techniques at different stages, whereby intensive animal breeding operations require industrially based feeding and a mastery by the food industry of the techniques of large-scale processing and distribution.

(iv) The internationalization of companies and techniques has, for some ten years now, encouraged the international transfer of processes and know-how in the food sector. Within a context of mounting international competition, the strictly nationally-based companies of the developed countries are more inclined to involve themselves in industrial co-operation than to establish production facilities on a permanent basis in the developing countries. These countries, therefore, can take advantage of this fact in terms both of the diversification of their industrial establishments, and of the improvement of their technological capability (vocational training and the technical mastery of equipment and procedures).

2. AGRO-FOOD DYNAMICS AND DIFFERENCES AMONG DEVELOPING COUNTRIES

In analysing the developing countries, this paper refers specifically to the 15 countries mentioned in table 1. These countries were selected in order to reflect the contrasting situation in respect to the development of the food-processing (agro-food) sector from one country to another and the diversity of the constraints which inhibit industrialization policies in this area.

The selection of countries, which is necessarily an arbitrary one, is intended only to single out a few cases illustrative of contemporary processes in the development of agro-industry and the formulation of the corresponding food policies.

Of the 15 countries selected for this analysis:

- Three are very large countries, eight are medium-sized countries and four are small countries. A deliberately balanced continental distribution has been selected.

- In ten of the countries chosen for the analysis, the cities account for 30 per cent or more of the population, and in five for more than 50 per cent.

- Eight of the countries have a substantial food-processing potential, as seen in the fact that in 1981 the value added in the food industries (ISIC reference 3110) exceeded $500 million.

2.1 The structure of the food industries

The growth of the food industries has taken place against the background of sustained advances in per capita food production in all of the countries of Latin America and Asia listed in the synthesis tables (tables 2 and 4). Only Africa has failed to benefit from this trend, with the exception of the Sudan.

From 1975 to 1981 (table 2), the food-industry production growth rate was comparable to that of the entire manufacturing sector in the Latin American and Asian countries, and was even noticeably higher in three Asian countries: Korea,

Indonesia and the Philippines. The relative weight of agro-food activities in the economies of the countries selected differs. As indicated by the data of table 2 reproduced in diagram I, the situation in the Sudan and Upper Volta appears to be the most extreme. In effect, in these countries 69 and 78 per cent, respectively, of the manufacturing value added are accounted for by the food industries, with agriculture representing 38 and 41 per cent, respectively, of the total value added. Conversely, such countries as Brazil, Mexico, the Republic of Korea and Malaysia derive only between 13 and 23 per cent of their total value added from agriculture, and between 11 and 16 per cent of manufacturing value added from the food industry (with food and beverages considered together).

In terms of employment, the indicators suggest a similar picture.

- In the new industrial countries (Brazil, Mexico, Colombia and the Republic of Korea), the active agricultural population represents less than 36 per cent of the total economically active population, and the food-processing (agro-food) industries account for between 7 and 20 per cent of employment in the manufacturing sector.

- Among the countries in which a high proportion (in the order of 50 per cent) of the economically active population continues to be engaged in agriculture, the level of manufacturing employment in the food industries is also highly variable, ranging from 12 to 25 per cent.

- Finally, the essentially agricultural countries may also have a diversified manufacturing industry which is not primarily based on food-processing. For example, in Thailand and Upper Volta, where 75 and 95 per cent of the economically active population, respectively, is engaged in agriculture, the food industry accounts for only 15 per cent of manufacturing sector employment.

2.2 Demographic constraints and the food system

Very often, the first indicator cited to justify alarm over the long-term food balance in the developing countries is the overall population growth. In fact, however, this factor is not the most significant in describing the social reality of these countries, and a more subtle analysis is required.

- Diagram III, which is based on the data of table 3, shows that, in growth terms, it is rather the expansion of the urban population which is the most alarming trend in the developing countries. In effect, in all of the countries considered, with the exception of Colombia, urban growth exceeds 3 per cent per annum (vis-à-vis the total population, this figure is regarded world-wide as a tolerable ceiling) and more than half the countries listed report a rate of more than 4 per cent per annum.

- On the basis of table 3, it is possible to observe that the reduction in the relative proportion of the agricultural population has been accompanied by a small - but not negligible - annual increase in this population.

These factors become meaningful only when considered in connection with the other social realities of these countries, such as, for example, the increasing disparities in revenue between the cities and countryside in favour of the former and the rapid changes in food consumption patterns in cities increasingly supplied with imported foods.

The data on urban demography and nutrition reveal that the developing countries which have achieved the highest levels of urbanization are those whose food consumption patterns have undergone the most far-reaching changes. Thus, Brazil, Colombia, the Dominican Republic, Mexico and the Republic of Korea are countries where the rate of urbanization has advanced well beyond the 50-per-cent mark in respect of the total population, and diagram IV shows that there has been a dramatic increase in these countries in the proportion of animal protein in the national diet. In the same countries, three of which are so-called "new industrial countries", the qualitative improvements in food consumption have been accompanied by a relative decline in the expenditure for food in household budgets. Statistics for the Republic of Korea indicate that expenditure for food represented 64 per cent of the average household budget in 1962 and 52 per cent in 1975; by way of comparison, a Moroccan economist has estimated this figure at 65 per cent in 1981 for his country.

The qualitative changes in food consumption, therefore, represent a basic trend, linked on the one hand, to the increase in average household revenue (Engle's law) and, on the other, to the new social conditions ushered in through the growth of towns and cities. Still, it should be noted that this trend does not exclude a certain flexibility in the rate at which food habits are changing. Moreover, there are very definite national differences as to the adoption of costly consumption patterns based on animal protein, particularly agriculturally produced protein (extensive or intensive cattle-raising). For example, in Korea animal protein accounts for only 20 per cent of protein intake, whereas in Mexico, for an equivalent nutritional level, animal protein represents 33 per cent of the contribution.

Overall statistics, however, are a poor indicator of the considerable qualitative differences that exist in diets - differences linked both to social structures and to national habits. For example, the African and Latin American countries which consume red meat without deriving a sufficient protein intake could improve their nutrition by increasing the consumption of white meat. Similarly, one often observes only a limited increase in the consumption of milk alongside a virtual explosion in the consumption of exclusively caloric beverages (mainly carbonated beverages, in both Latin America and Asia).

2.3 The agents and policies in the industrialization of the agro-food sector

The development history of the agro-food sectors of the developing countries explains the differences which are to be found between one country and another and between one continent and another.

- While the industrialization of the Mexican agro-industrial complex is largely due to the affiliates of the North American multinational corporations, in the Republic of Korea national capital has played a decisive role in the expansion of the food industry (on the basis of the assets created by the Japanese occupation during the Second World War). Moreover, in Mexico industrialization has been marked by a powerful agro-export thrust deriving from a partially intensified agricultural system. Conversely, in Korea there has been a change in the export philosophy of the food industry, and the reorientation towards the internal market (which absorbs 40 per cent of processed production) has occurred in parallel with a process of agricultural intensification (during the 1970s) and in pace with changes in national food consumption patterns.

- At the present time, many countries are reaching the point of integrating the various facets of their food production sectors within a nationally based industrialization process, whether in respect of agents, techniques or capital. This trend can be clearly seen in Brazil in the poultry and sugar sectors, and other countries such as Thailand (in the case of rice) and Senegal (in the case of oil plants) could also arrive at this stage.

3. POSSIBLE STRATEGIES FOR A MORE EFFECTIVE INTEGRATION OF THE AGRO-FOOD SECTORS IN THE DEVELOPING COUNTRIES

3.1 The diversification of industrial structures

A number of levels of action are available in the effort to advance the industrialization of the food sectors, whether in the sense of correcting the current distortions in production structures (overemphasis of processin for export and insufficiency of production for the domestic market) or of creating, or strengthening, the industrial establishment.

(a) At the level of primary processing industries

Here, there are opportunities for two kinds of countries:

- On the one hand, for underindustrialized countries where agriculture is non-intensive, such as Senegal and the Dominican Republic, in order to impart a fresh impulse to agricultural development;

- And, on the other hand, for countries where the agro-industrial complex is in a phase of intensification (such as in Mexico and Morocco) and where steps can be taken to avoid or correct the failure to integrate an extensive agricultural sector within the overall economy.

It is desirable, therefore, to promote the launching of programmes to develop agricultural products near the agricultural sector. The choice should make it possible to maintain a balanced agriculture-industry relationship, through the development, for example, of co-operative establishments in rural areas. Enterprises of this kind can undertake traditional production activities (slaughtering operations, meat-cutting, vegetable and fruit packaging, etc.), in addition also to working with higher degrees of processing (pastry items, cooked dishes, semi-preserved products, etc.). These activities help to curb the exodus of the rural workforce (the victim of seasonal occupational fluctuations or underemployment) and promote the retention of income in rural areas. What is more, the commercial and financial channels that a co-operative sector can generate are conducive to improved linkages between the towns and the countryside.

(b) At the level of secondary processing industries

The principal advantage to be gained from the development of secondary processing industries consists in a better supply situation - in terms both of quality and regularity - for the large metropolitan areas and small urban centres. These industries also contribute to moulding the public diet, and for this reason what they produce should help to raise the level of nutrition.

Seen in this way, the urban market provides numerous potential areas of activity which remain to be serviced by local production, without waiting for a multinational corporation to generate commercial activity either by identifying internal food needs or by creating them.

This expansion of the secondary processing sector is necessary:

- For products of low value added (traditional products; foods for groups; foods for consumption outside the house, in the street and at the workplace);

- For more highly processed products for which there is increasing demand from those sectors of the population which enjoy steady and higher income levels (fresh dairy products, ice creams and industrially prepared pastry items, precooked dishes, frozen foods, etc.).

3.2 A multiplication of agents

(a) At the present time, if it is true that the agro-food industry capacity of the developing countries is, as a rule, inadequately diversified, this situation is attributable to the fact that the agents involved are too few and too little varied. To be sure, a few countries have turned over their food-processing industries to parasitical multinational companies or to an initiative-deadening

State monopoly, but the fact is that there are very few cases of the simultaneous development of the co-operative sector, private small enterprises, foreign firms (not always of multinational standing) and national groups. It would seem essential, therefore, to promote the emergence, or strengthen the position, of more diverse agents in the agro-food complex, by taking greater account of:

- Small-scale rural entrepreneurs engaged in primary processing (dairy farms, flour mills, etc.);

- Rural co-operatives with the capacity to extend their activities from primary to secondary processing;

- Small urban enterprises with the ability to respond effectively to changing market requirements in a variety of areas (industrial bakeries, carbonated beverages, ice creams, precooked dishes, etc.);

- Enterprises in other branches of activity capable of absorbing and adding value to the by-products of the food industries (chemical, chemical-related, cosmetic and pharmaceutical enterprises).

These agents should benefit from a redirection of national investment activity (loans to small and medium-sized enterprises, co-operative credit, etc.) and also from external financial assistance (multilateral and bilateral). Foreign financing would also make it possible to promote industrial co-operation with companies of the same kind located in the industrialized nations, and in particular with:

- The large co-operative groups (which rarely have transnational facilities);

- The small and medium-sized enterprises, which despite their lack of in-house means for co-operation, are in a position to transmit easily assimilable experience and technologies.

(b) A better national mastery of food-processing technology would appear to be a complementary objective to the preceding one. This is immediately evident when one considers the present underproductive (though generously subsidized) establishments, the facilities renovated at great expense by foreign operators, the costs of importing minor production equipment for common items and the inadequate potential of the developing countries to produce capital goods for their food industries.

Industrial co-operation with food firms in developed countries is a preferred way of acquiring technology (processes and know-how not encumbered by formal requirements) and of accelerating personnel training. However, this should not lead to neglect of the real possibilities of co-operation with the capital equipment manufacturers. Relations in this area could be closer and, above all,

more durable than they are, if they were to be based on a more rigorous and more voluntaristic technology transfer policy. A policy of this kind could benefit from the renewal of world capacity in the area of food equipment production. The fact is that the agents are more numerous in this area as a result of the increased role of the planned-economy countries (Czechoslovakia, German Democratic Republic, etc.) and the emergence of serious competition in the developing countries (India, Brazil, Korea and Taiwan). On the other hand, competition among the industrialized countries themselves is quite keen (a factor representing an additional trump card in negotiations) because of the strategies under which the equipment manufacturers are seeking to extend their activities to the area of machinery and facilities for food production in developing countries (small "tailor-made" facilities and compact installations).

3.3 Food products under economic restraints

At the present time, the majority of developing countries are concerned with "food strategies", since the term is fashionable. All these countries are faced with internal tensions in their rural production sectors, more or less serious nutritional deficiencies, difficulties in commodity supplies, problems arising out of price adjustments and subsidies, etc.; less common, however, are those countries where there is an awareness of the interrelations within the agro-food sector.

Seen in this light, the stakes involved in the strategies for the industrialization of the food sectors can be summarized in five objectives, which in descending order of priority are the following:

- To secure and improve the food supply of the urban population;
- To stabilize peasant activity and the rural food supply;
- To reduce reliance on external supplies;
- To diversify the capacity and strengthen the agents of the manufacturing sector;
- To contribute to the development of techniques and national training.

These objectives are at the point of intersection of policies in the area of industry, agriculture, employment, foreign trade, social affairs, land ownership, etc. This can explain why so exemplary a food strategy as the Mexican Food System first of all fell victim to political vicissitudes and, secondly, has not been adopted by other countries in search of "food strategies".

Within the same order of ideas, it is arguable that it is not so much agricultural and food resources that the majority of developing countries lack, as it is the will to make political decisions and political choices. The case of the Republic of Korea or Brazil illustrates the dilemmas which countries already face or will have to face as they approach the task of industrializing their agro-food sectors: the protection of national agriculture versus the reduction of the cost of feeding their urban populations; the increase in export revenues versus the stabilization of internal prices; the protection of local equipment industries versus access to high-performance technology; etc.

3.4 Mastery and adaptation of the "oilseed-animal protein" sector

The "oilseed-animal protein" sector can be the means for testing the capacity to master the food production/consumption relationship at the national level:

(i) By revealing the participation of the local agents in the process of extending and partitioning the food chain in parallel with the intensification of production;

(ii) By assessing the correlation between, on the one hand, the development of this sector and, on the other, the deepening or stabilization of the internationalization of trading, including trading in the technologies on which this sector depends.

In any case, the "oilseed-animal protein" sector must be structured in line with the integration potential existing in the developing countries, either as a function of the anticipated demand in terms of internal consumption or in relationship to the production capacities at the various stages of this sector.

(i) In the agricultural countries, with little urbanization and a low level of per capita income, this sector could, in the best of cases, provide the framework for an intensification of agricultural production and the means towards better rural nutrition; in the worst of cases, it would be an area of outward-looking growth and of dependence for inputs, technology, financing and final markets on the countries which will have contributed to its establishment. These factors can be studied in detail in the case of a number of countries (for example, Indonesia, Tanzania and Upper Volta).

(ii) In the countries where the agro-food sector is a preponderant one and in the process of being industrialized, and where, in addition, the growth of the urban population is leading to changes in the places and habits of food consumption, the integrated "oilseed-animal protein" sector can contribute to a stabilization of food prices and to an improvement in nutrition. However, one must be aware of the fact that the promotion of an "oilseed-animal protein" system is an operation costly in terms of material and human resources. The situation in Morocco, the Philippines, Senegal and the Dominican Republic testifies to this fact.

(iii) In the more industrialized and highly urbanized countries, the "oilseed-animal protein" sector already has a privileged place alongside the other sectors. What is involved in this case is the genuine mastery of national integration (in order to avoid the generation of deficits for the supply of costly inputs: animal feeds, genetic strains, etc.) and also the formulation of a food model that does not exclude the other sectors. A situation of this kind can be found, with certain variations, in the Republic of Korea, Mexico and Brazil.

Finally, while the "oilseed-animal protein" sector may be seen as a vehicle for the building of an agro-food industry, it does not exclude other sectors that might be found to involve a higher degree of national integration (aquaculture/fish products, or cereal/vegetable protein).

Table 1. Developing countries selected for the analysis

Value Added in the food industries (ISIC 3110) in 1981 (in millions of 1975 dollars)	Size of the countries in 1981								
	Population under 10 million inhabitants			Population 10-50 million inhabitants			Population above 50 million inhabitants		
Urbanization factor[a/]	t <30%	30%=<50%	50% <t	t <30%	30%=<50%	50% <t	t< 30%	30%=<50%	50%<t
Value added less than $500 million	Upper Volta	Bolivia Senegal	Dominican Republic	Sudan Tanzania	Morocco Malaysia				
Value added $500-1000 million				Thailand		Colombia Republic of Korea			
Value added more than $1000 million					Philip-pines		Indonesia		Brazil Mexico

a/ Urbanization factor: urban population/total population

Sources: UNIDO and World Bank

Table 2. Agro-food sector indicators

Countries	Distribution of Gross Domestic Product 1/				Distribution of economically active population		Manufacturing value added				Production index	
	Agriculture		Manuf. industry									
	1960 %	1981	1960 %	1981	Total agriculture 1981	Agro-food industry/manufacturing	1980 Amount in 1975 dollars	Agro-food industry 1/ %	Food industry 2/	ISIC 3110 1981 (1975 dollars)	1981 Manufacturing	1975 = 100
Bolivia	26	18	15	14	50	28.9	389	-	50.5	89.4	127	135
Brazil	16	13	26	27	30	12.9	44733	14	14.1	5440	143	134
Colombia	34	27	17	21	26	20	3293	32	14	522	165	159
Dominican Republic	27	18	17	15	49	38.8	931	72	56	480	126	114
Mexico	16	8	19	22	36	14.3	29084	19	11.5	2455	142	134
Upper Volta	55	41	9	12	82	15	94	-	78.4	84.8	-	160
Morocco	23	14	16	18	52	18.2	1960	32	21.8	366	-	129
Senegal	24	22	12	15	77	48.5	348	52	31.8	70.6	-	79
Sudan	-	38	-	6	72	-	284	-	69	137	-	124
Tanzania	57	52	5	9	83	24	237	-	32.5	51.5	-	109
Rep. of Korea	37	17	14	28	34	7.3	9843	17	8.5	872	240	252
Indonesia	50	24	-	12	55	16.7	5546	29	20.1	1028	212	231
Malaysia	36	23	9	18	50	13.7	2780	22	16.1	294	185	134
Philippines	26	23	20	25	46	22.7	5519	39	36.8	1478	143	164
Thailand	40	24	13	20	76	14	4355	-	20.8	558	-	105

Sources: 1/ World Bank.

2/ UNIDO.

Table 3. Demographic indicators

Country	POPULATION			URBAN POPULATION 1/		
	Millions (1981)	Annual percentage of growth (1970-1981)	Projection for 2000	Millions (1981)	Percentage of total population	Annual rate of growth (1970-1981)
Bolivia	5.7	2.6	9	2.565	45%	6.9
Brazil	125	2.1	177	85	68%	3.9
Colombia	26.3	1.9	38	16.832	64%	2.6
Dominican Rep.	6.1	2.9	9	3.172	52%	5.3
Mexico	71	3	115	47.57	67%	4.2
Upper Volta	6	2	11	0.66	11%	6
Morocco	21	3.1	40	8.61	41%	4.6
Senegal	6	2.7	10	2.04	34%	3.7
Sudan	19	3.1	34	4.94	26%	7.1
Tanzania	19	3.4	36	2.28	12%	8.6
Rep. of Korea	39	1.7	52	21.84	56%	4.6
Indonesia	150	2.3	216	31.5	21%	4
Malaysia	14	2.5	21	4.2	30%	3.3
Philippines	50	2.7	76	18.5	37%	3.7
Thailand	48	2.5	69	7.2	15%	3.4

(Continued)

	AGRICULTURAL POPULATION 2/ Millions (1981)	Percentage of total population	1970	Annual growth rate (1970-1981)
Bolivia	2.9	50.9%	2.4	0.75%
Brazil	46.9	37.5%	43.4	0.31%
Colombia	7	26.6%	7.8	-0.43%
Dominican Rep.	3.3	54.1%	2.7	0.80%
Mexico	25.2	35.5%	23.1	0.34%
Upper Volta	5.7	95.0%	4.7	0.76%
Morocco	10.6	50.5%	8.6	0.83%
Senegal	4.3	71.7%	3.4	0.93%
Sudan	14.5	76.3%	11.5	0.92%
Tanzania	14.9	78.4%	11.4	1.06%
Rep. of Korea	14.6	37.4%	16.2	-0.41%
Indonesia	87.3	58.2%	81	0.30%
Malaysia	6.6	47.1%	5.9	0.44%
Philippines	22.7	45.4%	19.9	0.52%
Thailand	36	75.0%	29.1%	0.84%

Sources: 1/ World Bank
2/ FAO

Observation: Since different bases were used for the calculation of the data of these two tables, they cannot be arithmetically compared and are intended to provide general values only.

Table 4. Nutrition indicators

Country	GNP/inhabitant		Nutrition 1980			Food products/inhabitant indicator 1970/1980					
	$ 1973	$ 1981	Calories/ inhabitant	Total proteins (a)	Animal proteins (b)	1980 Ratio b/a	Ratio 1973	1970	1975	Annual growth rate, %	1981
Bolivia	230	600	2084	52.7	16.6	31.5%	27.1	101	116	0.5	104
Brazil	760	2220	2447	59.3	22.6	38.1%	33.9	102	114	2	131
Colombia	440	1380	2529	-	-	-	-	99	111	1.8	125
Dominican Rep.	520	1260	1980	44.6	18.2	40.8%	38.4	101	95	0.5	102
Mexico	890	2250	2791	72.2	23.9	33.1%	26.7	100	100	0.3	111
Upper Volta	70	240	1791	64.5	6.8	10.5%	10.6	102	99	-0.5	97
Morocco	320	860	2628	69.6	10.6	15.2%	15.3	96	84	-1.8	75
Senegal	280	430	2406	-	-	-	-	83	118	-1.8	90
Sudan	130	380	2447	69.9	18.5	26.5%	28.8	100	106	0.4	104
Tanzania	130	280	2051	47.8	15	31.4%	30.3	104	100	-0.9	89
Rep. of Korea	400	1700	2957	80.4	16	19.9%	13	99	116	3.5	128
Indonesia	130	530	2315	47.2	5.3	11.2%	11.3	102	108	0.8	123
Malaysia	570	1840	2625	59.1	23.8	40.3%	32.9	100	118	3	142
Philippines	280	790	2275	51.7	18.5	35.8%	38.4	102	111	2.1	121
Thailand	270	770	2308	47.5	12	25.3%	24.4	100	119	2.8	141

Sources: IMF and FAO

Observation: (a) and (b) are in grams per inhabitant per day.

Table 5. Foreign trade indicators

Countries	Food Imports SITC 0, 1, 22, 4 Millions of dollars 1970	1975	1980	Var. 1975/1970	Var. 1980/1975	Annual 1980/1975
Bolivia	31.9	97.6	100	205.96%	2.46%	0.21%
Brazil	312	828	2395	165.38%	189.25%	9.66%
Colombia	65	141	545	116.92%	286.52%	12.46%
Dominican Rep.	28	107	235	282.14%	119.63%	7.07%
Mexico	113	848	2654	650.44%	212.97%	10.42%
Upper Volta	9.5	32	83	236.84%	159.38%	8.63%
Morocco	141	764	1020	441.84%	33.51%	2.54%
Senegal	55.5	143.5	255	158.56%	77.70%	5.12%
Sudan	66	178	390	169.70%	119.10%	7.05%
Tanzania	17.5	143	161	717.14%	12.59%	1.04%
Rep. of Korea	341	1025	3123	200.59%	204.68%	10.16%
Indonesia	103	596	1365	478.64%	129.03%	7.46%
Malaysia	301	641	1266	112.96%	97.50%	6.09%
Philippines	135	396	647	193.33%	63.38%	4.36%
Thailand	70	141	491	101.43%	248.23%	11.45%

(Continued)

	Food Exports				Coverage rate 1975	Coverage rate 1980
	1975	1980	Var. 1980/1975	Annual 1980/1975		
Bolivia	28	60	114.29%	6.84%	0.29	0.60
Brazil	4700	9260	97.02%	6.07%	5.68	3.87
Colombia	937	2840	203.09%	10.11%	6.65	5.21
Dominican Rep.	707	728	2.97%	0.25%	6.61	3.10
Mexico	925	1837	98.59%	6.14%	1.09	0.69
Upper Volta	32.5	37	13.85%	1.13%	1.02	0.45
Morocco	385	675	75.32%	5.00%	0.50	0.66
Senegal	240	205	-14.58%	-1.36%	1.67	0.80
Sudan	180	275	52.78%	3.75%	1.01	0.71
Tanzania	188	305	62.23%	4.29%	1.31	1.89
Rep. of Korea	660	1290	95.45%	5.99%	0.64	0.41
Indonesia	570	1664	191.93%	9.75%	0.96	1.22
Malaysia	885	1950	120.34%	7.10%	1.38	1.54
Philippines	1263	2070	63.90%	4.38%	3.19	3.20
Thailand	1340	2995	123.51%	7.24%	9.50	6.10

Source: FAO

DIAGRAM I. SHARE OF AGRICULTURE AND FOOD INDUSTRIES IN EMPLOYMENT

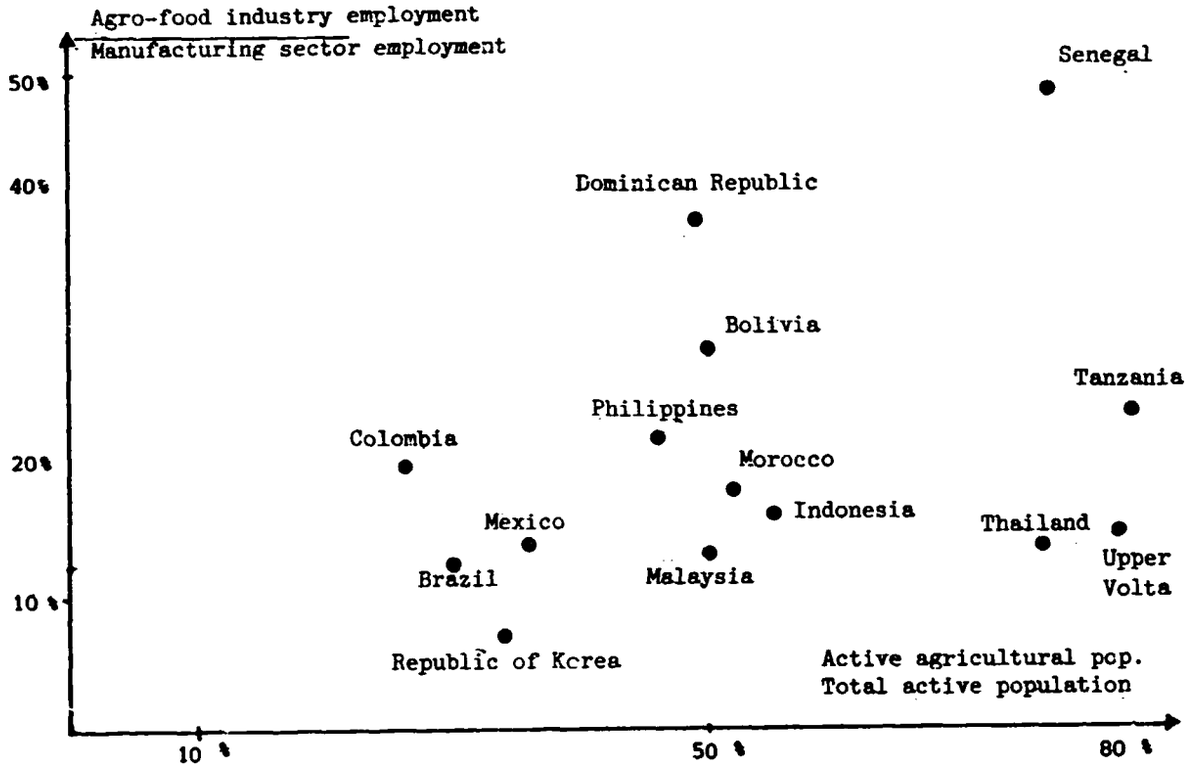

DIAGRAM II. SHARE OF AGRICULTURE AND THE FOOD INDUSTRIES IN THE VALUE ADDED (VA)

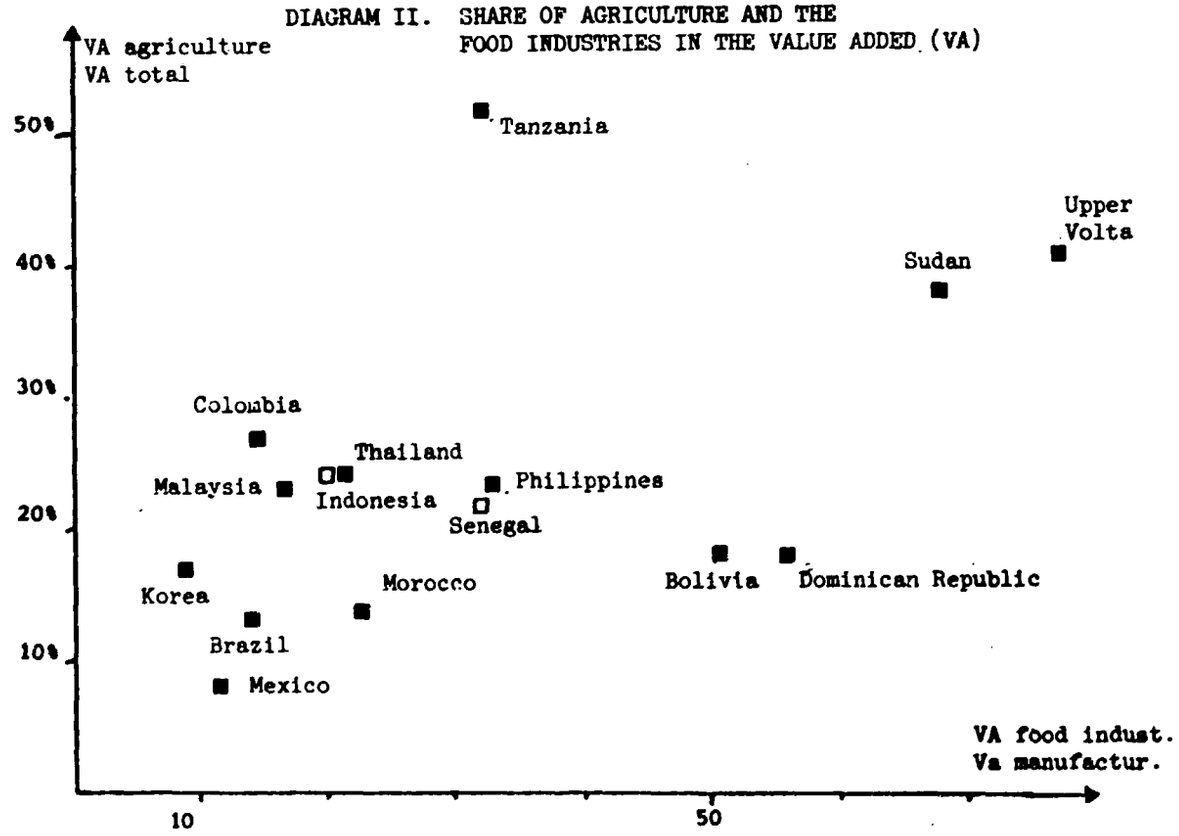

DIAGRAM III. DEMOGRAPHIC REVOLUTION

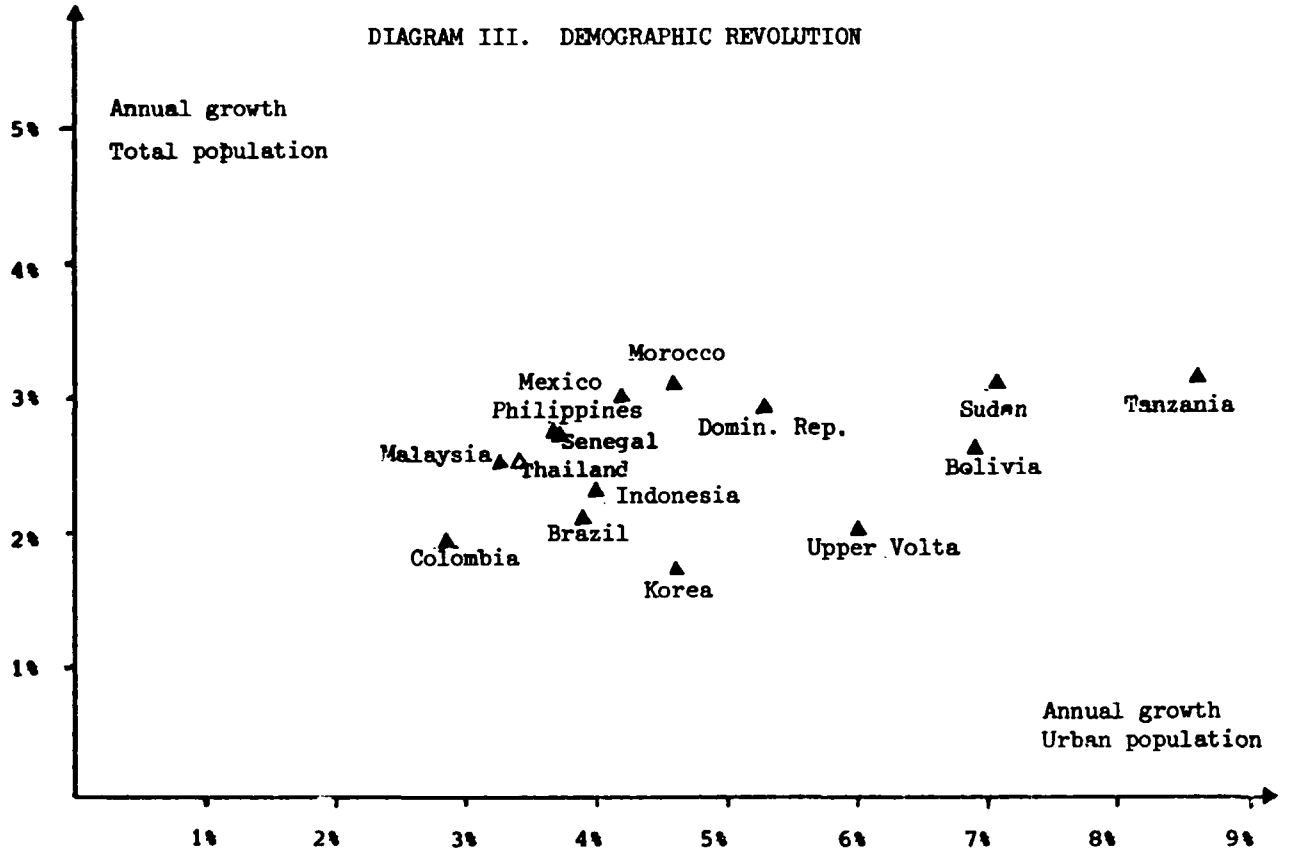

DIAGRAM IV. CHANGES IN NUTRITION AND PER CAPITA INCOME