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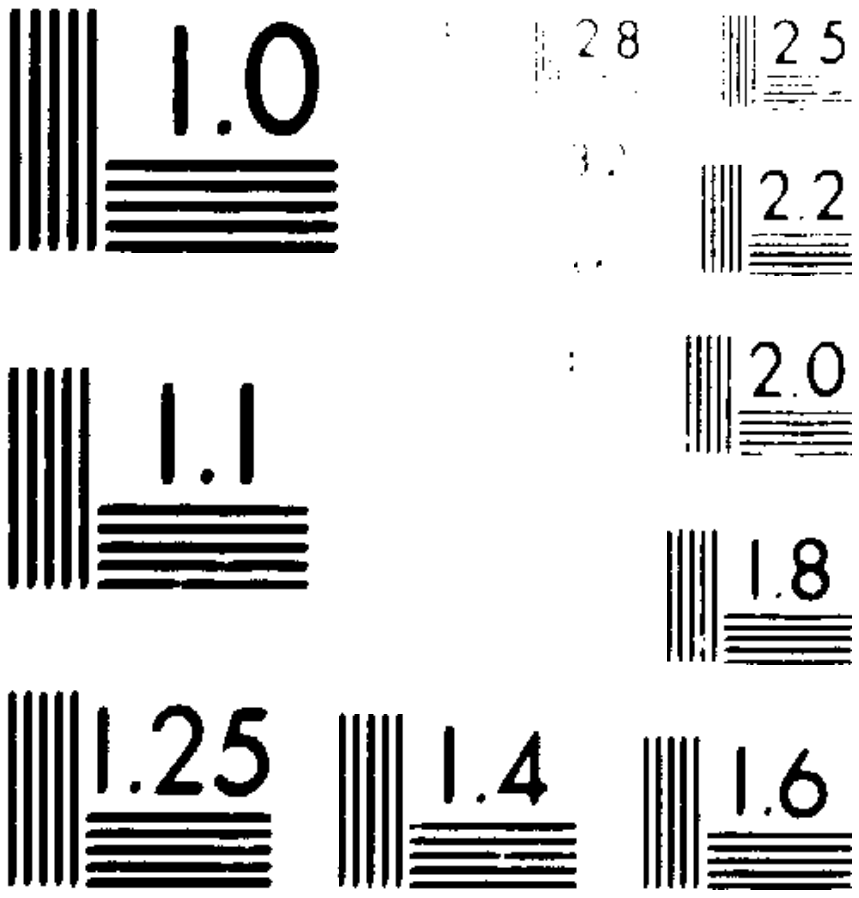
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THE EVOLUTION OF PRODUCTION IN THE AGRO-INDUSTRIES OF DEVELOPING COUNTRIES: GENERAL OVERVIEW AND SECTORAL DATA

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December 1982.

CONTENT

THE EVOLUTION OF PRODUCTION IN THE AGRO-INDUSTRIES OF DEVELOPING COUNTRIES : GENERAL OVERVIEW AND SECTORAL DATA.

A. Place of the LDC's agro-food sector in the world evolution of agro-industries.

At world scale, agro-industries, defined as manufacturing industries utilizing agricultural products, vegetal and animal, fisheries and forestry products, as raw materials, do represent about 15 % of the industrial branches classified inside the ISIC system. The three most important sectors (ISIC 31, 32, 33) i.e. food and beverages, tobacco, textiles, wood and furnitures, supplied, at the beginning of the 1970's, about 20 % of value added and 33 % of employment of world manufacturing industries.

Developed countries, with market economies (DME) represented 53 % of value added and 32 % of employment. Developed countries with planed economies (DPE) supplied 34 % of value added and 14 % of employment. Developing countries with market economies (LDC's) contributed only for 13 % of value added, but provided about 50 % of employment of world agro-industries.

The rather weak contribution of LDC's to world output contrasted with the heavy weight of the sector in their own manufacturing industries : 40 % of value added and more than 50 % of employment.

At the international scale, the LDC's agro-industries looked thus relatively labour-using and their productivity was an average 16 % of the level reached by DME's. (1)

Productivity gap had increased during the 1960's. Value added had expanded at a rather similar pace in DME's and LDC's (average annual rate of growth of 4,1 % and 4,5 %). But employment rates of growth had been significantly different in the two groups of countries (0,5 and 2,3 %).

If one does look only the agro-food sector which was the most important agro-industry (57 % of world value added), one can see that these features have not changed in a significant manner during the 1970's.

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(1) ONUDI, Etude du développement industriel, n° spécial pour la deuxième conférence générale de l'ONUDI, 74, II.B.14, New York, 1974, p. 248-251

Agro-food output of LDC's has increased more than in other groups of countries. Value added was increased respectively by 52 % in LDC's, 43 % in DPE's, and only 29 % in DME's, between 1970 and 1978. Between 1965 and 1970, these rates had been 31 %, 33 %, and 20 %.

The recent evolution of agro-food industry in LDC's does confirm a tendency to accelerate which could be observed in the last twenty years, and which does contrast with the trends in DME's and DPE's (Table 1).

Table 1. Compared rates of growth of value added in agro-food industries 1962-1978.
Average annual rates of growth in %

Periods	Developing countries with market economies	Developed market economies	Planed developed economies
1962-1974 (a)	5,3	4,0	6,1
1965-1977 (b)	5,6	3,5	5,5
1970-1978 (c)	6,2	3,7	4,6

Sources (a) UN, Yearbook of Industrial Statistics, 1974 edition, New York 1976
(b) UN, Yearbook of Industrial Statistics, 1977 edition, New York 1979
(c) UNIDO, First consultative meeting in the Food Processing Industry, The Hague, October 1981.

The growth of output in LDC's has been realized through a considerable increase of employment (+41 %), in sharp contrast with the evolution in DPE's (+9 %) and DME's (+1 %).

Productivity disparities have thus been enlarged. The average labour productivity of agro-food industries in LDC's decreased from 22 % to 18 % of the level reached by DME's. Moreover, value added per worker in the agro-food sector of LDC's is about 5 % lower than the average of the manufacturing industry, whereas the ratio is higher in other groups of countries (10 % higher in DME's).

From an international perspective, agro-food industries in LDC's have thus been relatively dynamic in the last twenty years.

But two basic features have to be underlined.

1) The contribution of LDC's agro-food industries to world output of the sector does stay at a rather modest 15 % (Table 2).

Table 2. Evolution of the share of LDC's agro-food industries in world output and employment of the sector (1970-1978).

	Value added		Employment	
	1970	1978	1970	1978
World (1)	100	100	100	100
Dev.Market econ.	62	58	39	33
Dev.Plan. econ.	24	26	19	17
Developing countries	14	16	42	50
of which Africa	1	1	4	4
Latin America	8	8	8	9
Asia	5	7	30	36

(1) excluding China

There was no significant evolution of this share in the last fifteen years in contrast with large changes which occured for other industrial sectors. Therefore, one has to be careful not to overrate the international aspects of the dynamics of the sector at the expense of its internal aspects.

Appropriate weight has to be given to the potential of the sector in increasing weight of LDC's contribution to world industry restructuring, but this aspect has not to be exclusive, as it is often the case.

2) The important contribution of agro-food industries to industrial output and employment is LDC's has to receive a careful attention. Because its rate of growth was lower than the rate of growth of other manufacturing industries in LDC's (5,6 % against an average of 6,5 % in the year 1965-1977), the contribution of the agro-food industries to total manufacturing output was slightly reduced. But they do stay at a level(22 %) which is

almost the double of the share they occupy in DME's. The contribution to employment is still much more important.

Therefore, one has to pay a great attention to the contribution of the sector to development strategies oriented towards internal demand and basic needs, creation of employment opportunities and valorization of national agricultural production through the diffusion of appropriate technologies.

B. Heterogeneity of agro-industrial structures in LDC's, by regions, countries and group of countries.

1. General aspects

The global contribution of LDC's to world agro-food industries does conceal very large discrepancies between areas, countries and group of countries.

Table 2 has already provided some informations about regional differences. It shows that during the 1970's Latin America remained the most important region as far as value added is concerned. But its position is stagnant and almost catched up by Asia. African contribution remained insignificant. Asia has contributed for the largest part to the increase of employment in the sector, and has the most labour intensive industry.

Table 3 to 9 do present some important features about countries differences.

If one shifts from regional differences to country by country comparisons, the most important feature is the concentration of LDC's contribution to world agro-food industry by a very small number of countries : 4 countries in a total of 95 (Brazil, India, Argentina, Mexico) supply 47 % of LDC's agro-food industries total output. Only 3 of them have a production above 10 billions U.S. dollars, but they do represent only 5,2 % of world agro-food industry gross value.

By comparison 9 DME's (upon a total of 24) have a production above 10 billions U.S. dollars and do represent 44,5 % of world production, whereas 6 DPE's (on 7) are in the same category and supply 31,6 % of world production.

Finally, 77 LDC's have an agro-food production under 1 billion U.S. dollars, a category in which there are no DME nor DPE, and they supply, together, only 4 % of world agro-food production. (Table 3).

Table 3. Distribution of world agro-food production by categories of producing countries (1975).(1)

gross value of agro-food prod. (in billions U.S. dollars)	Developing countries			Dev.Market eco.		Dev.Plan. eco.	
	Nber	Prod.in % of LDC total	Prod.in % of world total	Nber	Prod.in % of world total	Nber	Prod.in % of world total
+ 100	-	-	-	1	18.3	1	19.7
50-100	-	-	-	-	-	-	-
20-50	-	-	-	3	15.0	1	3.8
10-20	3	38.5	5.2	5	11.3	4	7.0
5-10	1	8.7	1.2	5	5.0	1	1.4
1-5	13	22.4	3.0	10	4.5	-	-
0.5-1	10	7.1	1.0	-	-	-	-
-0.5	67	23.3	3.1	-	-	-	-
Total	95	100.0	13.6	24	54.2	7	32.2

LDC's are not only separated by very wide differences in their contribution to agro-food world output, but also by very heterogeneous structures of production.

Ordering the 10 largest LDC's producers does indicate that there are significant differences in their respective share in total LDC's output and employment. (Table 4).

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(1) Table 3 to 9 have been computed and elaborated from data provided by the CTC 1981 report :
Centre on Transnational Corporations, Transnational Corporations in Food and Beverages Processing, ST/CTC/19, New York, 1981.

Table 4. Relative shares of the 10 largest LDC's agro-food producers in total LDC's output and employment (1975). (5)

	Total developing countries output = 100	Total developing countries employment = 100
1. Brazil	16.5	5.1
2. India	11.2	25.8
3. Argentina	10.9	3.0
4. Mexico	9.2	4.1
5. Turkey	3.5	1.6
6. Philippines	3.0	4.1
7. Venezuela	3.0	1.0
8. Iran	2.7	1.6
9. Colombia	2.6	0.9
10. Thailand	2.2	3.1

The contrast is particularly striking between the two leaders : Brazil and India. If Brazil has an output which is 50 % larger than India, employment is only 1/5 of the Indian level.

Philippines have an agro-food industry which has the same importance than in Venezuela, but employment in the sector is 4 times higher. Employment in the agro-food industries of Philippines and Mexico have almost the same volume, but Philippines output is only 1/3 of the Mexican one.

There is thus some room for further studies of the factors influencing these large structural differences which separate the dominant labour intensive pattern of Asian countries and the dominant capital intensive pattern of Latin American countries. The same question does apply to African countries, even if their small weight does exclude them from the 10 top leaders.

2. The need for a structural approach

A first way to tackle that problem of large heterogeneities among LDC's is to link it with the large income disparities which separate different categories of LDC's.

Low income LDC's (less than 250 dollars a year per capita) have indeed a level of processed food sales which is 10 times lower than the average level of high income LDC's (more than 1000 dollars a year per capita). These differences do correspond to similar differences, from 1 to 10, between the productivity levels in agro-food industries.

Whereas they have a population which is 4 times larger than high income LDC's, low-income LDC's have an agro-food production which is only 45 % of the former, but does provide 3 times more employment.

Moreover one can see that the share of value added does increase with the rise of average income levels (from 18 % in low income LDC's to 30 % for high income LDC's), whereas differences between urban consumption levels and average consumption levels tend to decrease (from 3 to 1 in low income LDC's to 1,5 to 1 in high income LDC's).

Thus one could be tempted to link the large disparities existing between the production structures of agro-food industries in LDC's with large differences existing between their general level of develcpment, measured, among other elements, by the differences in per capita income levels. (Table 5).

Table 5. Contribution of LDC's, by income groups, to output and employment of the agro-food industry; levels of productivity and food sales per capita. . Total LDC's = 100 (1975).

	Low income LDC's (-250 dol)	Middle income LDC's (250-1000 dol)	High income LDC's (+1000 dol)
Population	61	24	15
Gross value of output	21	31	48
Value added	14	35	51
Employment	56	26	18
Value added/worker	25	134	281
Food sales per capita(all LDC's=100)			
Total pop.	35	100	329
Urban pop.	110	233	525

According to a standard functional approach, these data are related with the different stages of a normal industrialization process.

Low income countries have normally a very low average level of agro-food products per capita, as very low level of urbanization and commercialization are associated with low levels of income per capita.

The elementary grade of processing of the agricultural surplus, required in order to sell in urban centers, is sufficient to explain large disparities between the average level of consumption of agro-food products, and the urban level, even if the latter is very low by international standards.

In this context, value added by the agro-food sector is very weak, and also labour productivity, as elementary processing is performed in very small-scale enterprises, semi-industrial and semi-handicraft, often located in the raw material production areas themselves.

The rise of average incomes linked with the growth of mining and industrial production and with urbanization, does foster an expansion of food processing and trading which is more rapid than growth of agricultural production. Simultaneously, the higher degree of agricultural products processing is reflected by an increase of the share of value added and of labour productivity.

The size of enterprises does increase in relation with increased specialization and economies of scale, allowed by the evolution of urban demand which determines more and more the localization of agro-food production.

In next stages, further increases in average per capita incomes are associated with a large diversification of food consumption patterns (including meat, milk and dairy products) which is diffused among different income groups through the simultaneous increase in the rate of urbanization.

This stage is not necessarily accompanied by an increase in the

average labour productivity, because the effects of diversification can compensate the effects of rising productivity in older sectors where capital intensity does increase.

Finally in the phase reached by very high incomes industrialized countries, the average food sales per capita is increasing through a very large diffusion of expensive animal products and through the growth of sophisticated industrial food products with a high industrial content and a high value added.

According to that functional approach, thereare thus different stages in the level of agro-food consumption and organization, through which all countries would necessarily pass, according to the evolution of their income per capita. At every level of average income does correspond a certain level of agro-food consumption and of labour productivity in the sector. (Table 6).

Table 6. Levels of food sales per capita, of labour productivity and of value added in agro-food industries, in relation with levels of income

Categories of countries	Food sales per capita		Value added per worker	Share of value added in gross value (%)
	Total	Urban		
	Total low income LDC's=100			
1.Low income LDC's	100	311	100	18
2.Middle income LDC's	282	658	541	31
3.High income LDC's	929	1482	1125	29
4.Mediterranean countries, Australia and New Zealand	1870	2600	1183	25
5.Western Europe	3270	3564	2179	32
6.North America	3582	3694	3176	28
7.Japan	2017	2364	1087	30

Confronted with recent facts, this functional type of approach does lead to attach a crucial importance to the passage between two situations represented respectively by low income LDC's and middle income LDC's.

Table 6 does show indeed that when LDC's move from the first to the second category, their level of urban processed sales is doubled (it is then 6,5 times higher than average processed food sales in low income LDC's), but the level of labour productivity in agro-food industries is multiplied by five, whereas the share of value added does increase by more than 50 %.

These impressive changes seem to be associated with a very spectacular increase in the rate of urbanization, which entails at the same time an important rise of marketed food consumption and the development

of urban agro-food enterprises of the industrial type.
With the shift to the category of high income LDC's, urban food sales per capita and labour productivity in agro-food industry are multiplied by two again. But the share of value added does not increase. The rise of the productivity level and of food sales per capita are accompanied, at this stage, by reduced disparities between urban and average consumption per capita. But the global changes seem however less impressive than these which occur between the low income LDC's and middle income LDC's.

There is thus a kind of structural gap between the features of agro-food production and consumption in low income LDC's and other categories of LDC's. These features have to be put in perspective with other aspects of the agro-food situation in low income LDC's.

A first aspect is the very important disparity which exists, in some low income LDC's, between the level of productivity in agro-food industries and the average national level of processed food sales.

It is the case for a large number of African countries.(Table 7)

Table 7. Disparities between average levels of food sales per capita and labour productivity of agro-food industries in some African countries. Average LDC's = 100

	Processed food sales per capita	Labour productivity in agro-food industry
Zambia	94	133
Kenya	87	130
Niger	84	270
Ivory Coast	78	314
Malawi	67	122
Nigeria	42	315
Cameroon	40	211
Tanzania	40	118
Zaïre	35	174
RCA	15	111

In these countries the evolution of productivity in agro-food industries seems to be largely independent of their consumption of processed food products. A large number of African countries have a food sales level smaller than the LDC's average, but a level of labour productivity in agro-

food industries which is much higher than the LDC's average. Technological features of the production structures seem to be largely independent of the size of processed food sales on the national market. This aspect, associated with the predominant export orientation of agro-food industries and with the predominant import content of their large scale technology (for export or local sales) seems to be even more determining than differences in income levels (Ivory Coast has an average capita income which is almost three times higher than Malawi and Niger).

Another important aspect is that in many low income LDC's, there are no close links between the share of industry in GNP, the share of industrial employment in total employment, and the share of urban population in total population. (Table 8)

Table 8. Disparities between levels of industrialization, industrial employment, and urbanization in some low income African and Asian LDC's. 1960-1980 (9)

	Share of industry in GNP (%)		Share of industrial employment in total employment (%)		Share of urban population (%)	
	1960	1980	1960	1980	1960	1980
1.Malawi	11	20	3	5	4	10
2.Rwanda	7	22	1	2	2	4
3.Niger	9	34	1	3	6	13
4.Madagascar	10	18	2	3	11	18
5.India	20	26	11	13	18	22
6.Pakistan	16	25	18	20	22	28
7.Indonesia	14	42	8	12	15	20
8.Sri Lanka	20	30	14	14	18	27

In many African and Asian low income LDC's increase of the share of industry in GNP have been important between 1960 and 1980 but with almost no change in the share of industrial employment.

Impressive changes in the share of urban population, when they occur

seem therefore to be largely unrelated with the growth of industrial employment.

Thus further progress of the share of industry in GNP will not necessarily entail spectacular changes in the rate of industrial employment and urbanization.

Consequently, one cannot necessarily extrapolate the future of agro-food consumption pattern and the profile of agro-food industries from the shift from one category of average income to another. In contemporary LDC's, there is no clear-cut relation between these shifts and corresponding expected changes in industrialization, industrial employment and rate of urbanization, associated with appropriate increases in the level of food sales per capita and growth of productivity in agro-food industries.

On the contrary, it seems that these structural features can vary independently from each other and not in the same direction.

In some cases, increases in labour productivity in agro-food industries have occured without significant changes in growth of per capita income, industrial output and employment, rate of urbanization and food sales per head. In other cases, significant growth in industrial output have not been associated with similar changes in employment, urbanization and progresses in food sales and agro-food production.

Again this is not only true for low income LDC's, but for many middle income LDC's which despite important changes in their industrial structure and average level of income do keep features of agro-food consumption per capita which are close to the situation of low income LDC's.(Table 9)

Table 9. Discrepancies between levels of average income and processed food sales per capita in some middle income LDC's
Average low income LDC's = 100

	Level of GNP per capita	Level of processed food sales per capita
1.Nigeria	400	110
2.Ivory Coast	460	200
3.Syria	530	253
4.South Korea	600	223
5.Algeria	750	335
6.Iraq	1200	230

Examination of tables 6 to 9 leads to affirm that the relations between the development of agro-food industries and general economic growth in comtemporary LDC's are highly complex.

An approach in terms of stages of sectoral growth, related with stages in average income levels, industrialization and urbanization levels, does not seem to have enough explanatory and predictive power to grasp, in a coherent way, the huge heterogeneities which have been noticed.

These discrepancies seem related with structural conditions of development of agro-food industries in contemporary LDC's. These conditions have been heavily affected by historical features which have shaped their involvement in the international division of labour.

Agro-food industries in contemporary LDC's have not developed as a part of a global dynamic of economic and industrial growth, in a national framework. On the contrary, this was the case for most of the developed market economies. Agro-food industries in DME's during a very long phase of industrialization, played a strategic role between national agriculture and national industry. They were an engine of transformation of the agricultural sector in close relation with the needs of the national market

related to the national pattern of industrialization and urbanization. Agro-food industries adapted progressively their size and technology to the growth of national urban markets and the rise of real incomes linked with the pervasive progress of national industrial structures. They benefited also from technological advances realized in other national industrial sectors and therewere thus close links between the general pace of industrial growth and growth of the agro-food industries. At the same time the latter fostered the growth of national agricultural production, its diversification and specialization, in relation with growth of urban markets and rises in real incomes which favoured the development of processed food with higher value-added and higher relative prices. This was the case also for countries which developed an agriculture for exports of relatively high priced processed foods (Netherlands, Switzerland, France, Denmark) toward more industrialized neighbour countries.

But this evolution of the developed market countries, modified profoundly the international environment by shaping the features of technology in agro-food industries according to the stages of industrial evolution and market sizes of the first industrial countries.

That mean that a further repetition of a balanced interdependence between growth of national industry, urbanization, agriculture and agro-food industries was rendered extremely difficult for the followers, at least in the framework of a market economy open to the constraints of the international division of labour.

This has been the case as well for LDC's which had developed in a first stage exports of unprocessed agricultural products, than for LDC's which moved, in a later stage, to more or less important industrial growth. In the first case, attempts to develop further processing of exports, were confronted with the necessity to incorporate available international technology in order to compete with international norms of product quality established by industrial nations. In the second case the growth of urban markets linked with industrialization led to a rapid diffusion of consumption patterns established in developed market economies,

and henceforth to the transfer of technological norms in agro-food industries adapted to that kind of food pattern.

In both cases, modern technological units in agro-food industries can develop as enclaves oriented to international demand or to selected national markets, but with no articulations with the rest of the agro-food economy of the country. Very high levels of labour productivity in agro-food industries can be combined with very low level of average processed food sales per capita. At the same time heavy strains are put on national agriculture in order to foster its adaptation to the needs of the agro-food industry developing with a capital intensive technology.

Agro-industries do not play the role of a bridge between the industrial sector and agricultural sectors, as it was the case in developed market economies. They appear more often as mere industrial branches shaped according to international technological norms, and the adaptation of the agricultural sector is realized through its complete break-up, and through a dualistic evolution where a small part of the agricultural sector does make an enormous jump to become adapted to the needs of agro-industries, the overwhelming rest being marginalized.

Therefore, historical legacies do not allow to see the evolution of agro-food industries in LDC's as a succession of logical stages associated with the progresses of industrialization and urbanization.

Historical tempo's are overlapping each other, and the predominant picture is one of a fragmented system with different structures evoluing in different times.

The dynamics of these disarticulated structures have to be explored, because if one cannot expect the repetition of a balanced path of growth between agro-food industries, industry and agriculture, one has to recognize the need for active policies in these fields in order to reduce growing disequilibriums and tensions.

The features of these disarticulations can be affected by many conditions. The ways by which a country agriculture has entered the international division of labour can play a very important role in order to shape the profiles of its agro-food industry. For instance the respective weight of large foreign plantations, of big local landownerships, of local farmers and of petty peasant producers, will affect the pattern and type of growth of agro-food industries for export, as well as their location.

The pattern of income distribution inequalities, associated with specific structures of industrial and urban growth, can play also a great role to shape the profiles of agro-food industries. The more unequal is the income distribution pattern, the more important the branded foods sector, using capital intensive technology, will probably be.

Persistance of small scale agro-food units, located in rural area, and being a link between agriculture and the industrial sector, will on the contrary be favoured, when patterns of income distribution are less unequal.

In this respect there are striking differences between the experiences of Brazil and India, which are the two main agro-food producers among LDC's. Table 10 indicates that compared with Mexico and especially Brazil, India has a relatively more equal income distribution. At the same time levels of agro-food industry output and sales per capita are significantly higher than it would be expected from differences in level of total industry output and industrial output per capita. And this is related with the persistance of a very labour intensive sector in agro-food industry.

Table 10. Levels of industrial indicators, labour productivity in agro-industry and processed food sales per capita, in relation with income distribution in some NIC's. (1)

Countries	Industry output	Industrial output per capita	Agro-food sector output	Employment in agro-food sector	Processed food sales per capita	Income distribution % of income received by lowest 10% of families	by highest 10%
1.Brazil	100	100	100	100	100	7.0	50.6
2.Mexico	71	120	57	74	110	9.9	40.6
3.South Korea	27	82	10	39	30	16.9	27.5
4.India	42	7	70	500	13	16.2	33.6

(1) Sources : figures elaborated from World Bank, Development Report 1981 and 1982
CTC, ST/CTC/19, 1981, op. cit.

The features of the South Korean situation are also interesting to underline. Despite its level of industrial output per capita which is close to the Brazilian one, South Korea has maintained a much more balanced income distribution profile. Less branded food of the international type have been incorporated in the diet than in Brazil and Mexico,which results in a much lower level of processed food sales per capita, given the relative prices of national traditional agro-food products and of branded foods.

The greater resistance of traditional food consumption pattern can thus play a great role to determine the place that agro-food industries can occupy between industry and agriculture. In the Korean case it seems associated with the maintaining of a rather labour intensive agro-food sector.

If one reminds table 6, Japan does show the same picture, as the features of its agro-food sector are not related with its relative position as industrial power. The place of national staple foods can thus affect very much the structure of agro-food industries, and the preservation of cultural indentity in food patterns, even, at the higher stage of industrial growth, can give more room to the national agro-food sector to play an active role in employment, to be a bridge between industry and agriculture, and to foster local technology geared to the satisfaction of national tastes.

Given all these elements, one is led to think that the dynamics and specificity of national agro-food systems in LDC's is linked with the higher or lower degree of integration which exist between their sectors of food for exports, branded foods, and staple foods, where it is useful to distinguish between the traditional staples (i.e. rice, cassava) and "new" staples (meat, wheat flour, etc...).

Foods for exports and branded foods will normally show the heaviest dependence from external elements to explain their features and growth profile : the role of foreign investment and of foreign technology is determining. Structural patterns of growth will, of course, be influenced by State policies. But in these two sectors, State policies can do little

to affect international markets and technology constraints. State policies will thus be confined, in general, to an attempt to maximise national benefits (in the case of food for exports) or minimize national costs (in the case of branded food). Policies intervention will play also an active role to foster the adaptation of some parts of the agricultural sector to the needs of the export and branded food sectors.

There is generally a striking disarticulation between the evolution of the two above mentioned sectors and of the staple food sector.

The link between agro-food sector and this sector is generally the weakest in LDC's. On the contrary, agro-food industry in developed market economies grew generally through processing of national staples. The dynamics of growth of agro-food industry in LDC's, shaped by exports foods and branded foods, does not entail such an evolution, and growing disparities are manifest between these sectors and staple food sector, which is more and more marginalized.

C. Agro-food industry output in LDC's : some data about the recent evolution by products and by regions.

Some preliminary remarks

The precedent section has shown that the large structural discrepancies existing among LDC's agro-food industries require an approach which can articulate the specific dynamics of agro-food branches : export-foods, branded foods, traditional and new staple foods. That approach needs a preliminary quantitative assesment of the output evolution which is the purpose of this section.

A first question is the relative share occupied by LDC's output in world total, for the main products. Table 11 does indicate the average situation in the mid-seventies, in terms of physical output. LDC's output was superior to 50 % of the world total for only 3 products : vegetable oil crushing, rice milling and raw sugar. These products can at the same time be listed as traditional staples and export foods. On the 5 products for which LDC's output represented between 30 % and 50 % of world total, 4 were staples or products with a relatively low value added. For 17 products upon a total of 33, LDC's output represented less than 15 % of world output. These products belonged to the categories of branded or sophisticated foods, with generally a rather high value added. These figures do confirm that LDC's agro-food industries have not played a prominent role in the restructuring of world industry in the last twenty years. Rates of growth have been generally higher than for the rest of the world, but given the small size of the initial LDC's output, they have not been sufficient to affect substantially the relative share in world total. In some cases (soya oil for instance) spectacular progress of output in some LDC's (Brazil) has been matched by similar expansion in DME's (USA). For most of the sophisticated agro-food industrial products, expansion of high income urban markets in LDC's has been too limited to offset, at the level of world output distribution, the effects of an increased diversification of consumption patterns in DME's. The participation of LDC's to that diversification has been rather modest (even for canned fruit).

Some noticeable progress have been made in the LDC's participation to the processing of traditional exported food products (coffee extracts,

Table 11. Share of the LDC's output in world total situation in the mid 1970's.
World total = 100
World total = 100 (in volume)

More than 50 %	30 - 50 %	15 - 30 %	Less than 15 %
Vegetable oil crushing (60)	Fish oils and meals (46)	Cocoa grinding (26)	Canned fruit (14)
Rice milling (59)	Dried fish (40)	Refined sugar (23)	Margarine (14)
Raw sugar (55)	Coffee extracts (33)	Wheat milling (22)	Malt (14)
	Meat slaughtering (32)	Milk (20)	Wine (14)
	Aquatic products (31)	Butter (20)	Beer (13)
	Soft drinks (30)	Concentrated milk (16)	Canned fish (13)
		Poultry (16)	Jams (12)
			Cheese (12)
			Confectionery (10)
			Meat processing (10)
			Chocolate (7)
			Baking (5)
			Animal feeds (5)
			Dried milk (4)
			Frozen fish (4)
			Canned vegetables (2)
			Concentrated juice (1)

Sources : figures are elaborated from different sources :
FAO Production Yearbook (1970-1980)
Yearbook of industrial statistics, U.N., New York 1974, 1976, 1979
UNIDO, Draft world-wide study on agro-industries, 1975-2000.

cocoa grinding and refined sugar), and have contributed to increase their share in world value added.

A second question is that if global changes in the form of the LDC's participation to the international division of labour in agro-food industry does not seem spectacular, some very significant changes have occured in the participation of some countries or regions (Latin America, Africa, Asia and Middle East) in world total output, at least for some products.

That evolution will be examined briefly here under, by order of importance of the products participation in world total.

1. Products for which LDC's participation is above 50 %

Two products will be examined : vegetable oils and raw sugar.

A. Vegetable oils output evolution in LDC's.

Despite great statistical problems, one can estimate LDC's participation to world vegetable oil seeds and products at approximately 60 % during the years seventies. No significant changes have occured in this share during the last twenty years. This is largely due to the heavy weight of the U.S. production (about one fourth of the world output) and its leading role in the expansion of soya products. But a very large redistribution has taken place among developing areas themselves.

That tendency has been accentuated in the last ten years at the benefice of Latin America and at the expense of Africa. (Table 12).

Table 12. Evolution of the relative share of world regions in vegetable oils output (1970-1980)

	1970	1975	1980
World	100	100	100
North America (developed)	23	24	23
Western Europe	5	6	6
Africa (developing)	11	9	8
Latin America	9	11	13
Asia and Far East (developing)	23	24	24
Middle East	3	4	3
USSR + Eastern Europe	13	10	9
Asian Centr. Plan.Econ.	13	12	12

Source : FAO Production Yearbook 1970, 1975, 1980 (oil equivalents)

Latin America oil industry has seen its production multiplied by 4, but the movement is due almost exclusively to the progress of soya (X44), and mainly in Brazil (X43), whereas other productions have known only slight changes or even regression.

Brazilian soy bean production was insignificant at the beginning of the 1960's, but has grown at a rate of 27 % a year during the sixties. It was undertaken with U.S. cultivars and fostered as well by the expansion of U.S. winter demand, world markets (for instance U.S. embargo in 1973 stimulated japanese importers to find alternative sources in Brazil), and national market.

As soy oil was substituted for imported vegetable oils, domestic consumption grew 28 % a year over the 1970's. There was also growing demand for soy meal, mainly for chicken feed.

Brazilian exports of soy and soy products (oil, meal and cake) rose from dollars 53 millions in 1969 to dollars 2.300 millions in 1980, i.e. 42 % a year, and they represent 10 % of Brazil annual exports. (1)

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(1) World Bank, Development Report, 1982, p. 50

Soy bean Brazilian production story is the most typical example of an agro-industry which can be transplanted from nil in a developing country, and can shaken deeply its agricultural structures and its consumption patterns in a very short period of time. These tremendous changes are at the same time deeply embodied in the new forms of the international division of labour.

For instance, this emergence of Latin America, especially Brazilian, production of "new" vegetable oil products, is naturally linked with changes in animal feeding techniques in industrial countries.

In Western Europe, at the end of the 1970's, oil cakes made from imported soy did represent 81 % of total output, whereas oil cakes made from traditional tropical oils represented only 12 % of the total. Imports of oil cakes made from traditional tropical oils represented only 15 % of total oil cakes consumption.

The relative stagnation of African production does present a sharp contrast with the dynamism of Latin American output (Table 13).

Africa has not participated to the export "boom" of the new vegetable oils, and at the same time it has lost ground in the world exports of traditional tropical oils.

In fact, African stagnation does conceal changes inside the production structure. Groundnut production decline has been only compensated by growth of cottonseeds and palm oil. Traditional important palm oil producers (Nigeria and Zaïre) have regressed, whereas new producers (Ivory Coast and Cameroon) have emerged.

Table 13. Evolution by world regions of vegetable oils output. 1960-1980 (1)

	1961-65	1969-71	1975	1977-78	1979-80
Latin America (including Brazil)	100	141	310	363	451
Asia (Southern and Oriental) (excluding China)	100	118	148	147	156
Africa (South of the Sahara) (excluding South Africa)	100	112	103	103	106
China	100	112	139	118	126
Brazil	100	187	575	544	713
U.S.A.	100	139	181	224	247
U.S.S.R.	100	123	124	131	134
E.E.C.	100	127	161	201	207

(1) including soyabeans, groundnuts, sunflowerseeds, rapeseeds, cottonseeds, olives in oil equivalent, palm oil, copra, palm kernels.
Data elaborated from :
FAO Production Yearbook, 1970, 1974, 1978, 1980,
U.N. Yearbook of industrial statistics (ISIC 311510, 311513, 311516, 311519, 311522, 311525, 311528, 311531, 311534, 311537) 1974, 1977, 1979.

But the importance of African contribution to world palm oil output has been completely outrun by the expansion of South East Asian production (mainly Malaysia and Indonesia). Between 1960 and 1980 African output has been expanded only by 38 %, whereas Asian production grew by 1060 %.

Such an evolution had consequences for international trade. Europe which does represent 53 % of the world vegetable oils imports (at the end of the 1970's), has reconverted more and more towards South East Asian imports for palm oil, copra and groundnut oil; total African exports did only represent 15 % of total European imports for palm oil, 65 % for ground-

nut products and 8 % for copra (1).

African contribution to vegetable oils world export have been reduced to about 7 %, and only a restricted number of countries have surplus for exports. Given the high rate of population growth in Africa, this situation will probably not change significantly in the next future, despite the numerous industrial projects which are planned in the sector by many African countries. Prospects seem thus rather limited for African countries to be active operators of world industry restructuring in the sector, even if the potential is impressive : at the end of the 1970's, European processing plants of tropical vegetable oils did represent the same output that total African export of vegetable oil products (1 million metric tons).

B. Raw sugar

In the last twenty years rapid changes have occured in the situation of developing countries concerning raw sugar output. Production grew very rapidly, but was oriented to growing national consumption, in contrast with the situation prevailing before World War II. Between the 1950's and the end of the 1970's, LDC's sugar production increased from 20 to 50 millions metric tons, but sugar exports increased only from 10 to 15 millions metric tons. Despite that increasing importance of sugar as a staple food for LDC's, these countries contributed, in the mid-1970's, for about 70 % of world sugar exports, oriented for almost 2/3 towards OECD countries. Between 1960 and 1980, all developing regions together have increased slightly their relative position in world total (Table 14).

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(1) L'Europe et les oléagineux tropicaux, Europe outre-mer, n° 587, décembre 1978, p. 12-13.

Table 14. Raw sugar output in developing countries .
Evolution and contribution to world total 1960-1980.

Regions and countries	Contribution to world output(%)			
	1961-65	1969-71	1974-76	1978-80
Africa(developing)	3	3	3	4
Latin America	29	29	30	30
S.and E.Asia	10	11	13	14
Middle East	2	3	3	3
Western Europe	15	15	16	18
Northern America	8	7	8	6
Eastern Europe	7	5	5	5
USSR	13	12	10	9
China	4	3	5	4

Sources : Figures elaborated from FAO Production Yearbooks data,

Evolution of output

1961-65	1969-71	1974-76	1978-80
100	150	156	201
100	123	138	154
100	141	188	225
100	178	217	223
100	132	150	181
100	115	138	114
100	95	105	117
100	112	100	104
100	104	179	146

1966, 1971, 1974, 1976, 1978, 1980.

Despite the higher rate of growth of S.E. Asian countries no significant changes have affected the relative contribution of the different developing areas. But some remarkable changes have occured concerning the relative position of the main producers : Brazilian production has taken the lead and has reinforced its position comparatively to Cuba and India, for what concerns centrifugated raw sugar. (the latter country staying the most important producer if one does include non centrifugated domestic production).

Even if production for the internal market does represent an increasing share of LDC's sugar output (an average of 70 % in the mid-seventies), Table 15 does show, that for an important number of small countries especially, production for export is still the most important.

Table 15. Developing countries with raw sugar export proportion above 50 % of country production.

Countries	Export proportion (%) (volume)	Proportion country merchandise exp. (value) (%)	Proportion world exp. (%) (value)
Barbados	72	35	0.3
Belize	94	68	0.3
Dominican Rep.	77	50	4.1
El Salvador	50	9	0.5
Guyana	93	44	1.4
Jamaïca	70	14	1.0
Mexico	58	3	1.1
Panama	60	14	0.3
Trinidad&Tobago	66	1	0.2
Mauritius	99	82	2.6
Swaziland	76	49	0.7
Fidji	92	59	0.9

Sources : calculated from FAO Production Yearbooks, and Trade Yearbooks, 1976, 1977, 1978.

For many of them, sugar export does still represent a very important part of their merchandise export. But they represent together only half of Cuba contribution to sugar world export (23 %).

These traditional small sugar exporters do attach a special importance to the regulation of international sugar markets and to the behaviour of industrial countries towards tropical sugar imports. A majority of these countries are linked with EEC through the 1975 Sugar Agreement which allow import quotas at guaranteed prices. In the recent years, negociations about the conditions of ACP sugar entry in the EEC markets have been always very hard. Increasing production and even tendencies to overproduction of beet sugar in EEC itself, have competed more and more harshly with ACP sugars on the British market, which was their main traditional outlet since the colonial era prolonged by the Commonwealth Sugar Agreement (1).

These problems could be hardened in the next future due to the apparition of new African exporters. Sugar industrial production has developed in most African countries only after 1960, but has expanded very rapidly. During the 1970's, 16 sugar complexes have been built in French-speaking African countries. At the end of the 1970's these countries were however still largely dependent on sugar imports which represented about the same volume than their combined national productions (about 200.000 metric tons) (2). In Nigeria, imports were almost 8 times more important than local output.

But situation is changing rapidly in some African countries. In Ivory Coast, when the 6 existing sugar complexes will have reached their full capacity (normally in 1983), the latter will be 3,5 times higher than the actual national market size. In Cameroon, when the Lagdo complex will add its capacity to the 2 existing units, potential output will be 2,5 higher than the national demand. This situation will lead progressively to necessary readjustements between EEC and ACP countries, or inside each

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(1) R. CHASLE, La situation du sucre des pays A.C.P. sur les marchés de la Communauté, Europe outre-mer, novembre 1980, p. 15-16

(2) International Sugar Organization, Yearbook 1979

of the two groups.

Despite high potential demand prospects for sugar in African countries (consumption per capita being 1/3 of Latin America consumption), actual mass demand is restricted by stagnant real incomes. At the same time, intra African sugar trade is restricted by the tendency of many countries, even the smaller ones, to build their own sugar complex. In many cases, the choice of technology leads to excess capacity. The drive to exports to world markets is reinforced by financial constraints. In many cases African new sugar complexes are made with capital intensive foreign technology, and do requires huge investment with a high rate of foreign indebtment, which is a supplementary element to the export drive. In Ivory Coast, for instance, the six sugar complexes built during the 1970's, have cost about 800 millions US dollars, of which 2/3 are constitued by foreign loans, mainly European and American banking and buyers credits (1).

The most extreme example of the preference given to heavy sugar technology in Africa is the case of the sugar industry in Sudan, where a new unit of 330.000 tons a year has been built, more than six times the average size of the Ivorian complexes. (2)

Because of its high technological and financial dependence, African sugar industry is thus facing important problems of adjustment, in a very unfavourable international context. World sugar actual demand does represent only 90 % of world sugar supply, which is itself largely under the optimistic forecastings made in the 1970's. (3)

Countries which have chosen a more inward-looking strategy coupled with a less capital intensive technology, will at the same time have lesser adjustment problems.

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(1) Les sucreries en Afrique noire francophone, Europe outre-mer, novembre 1980, p. 17-26

(2) Industrie et Travaux d'outre-mer, novembre 1979, p. 649-650

(3) Courrier ACP-CEE, n° 75, septembre-octobre 1982.

This is particularly the case in countries where an attempt has been made to develop national efficient small-scale technology, which can be integrated with agricultural production, and contribute positively to increase employment and incomes in rural areas. The Indian case is being well known, where during the 1970's, a specific technology has been developed with an average capacity of 1.000 tons a year. Small-scale plants do cost about 0,5 % of the modern large-scale plants utilized in Africa, and can create 300 working posts with the investment required for one in the large plants. Investment cost per ton is about one fifth of the large units. (1) Even if sugar extraction rates are slightly lower, such a technology, through its features, does contribute at the sectoral level, to create conditions for the development of future enlarged demand, and to reduce the gap between insufficient effective demand, and huge potential needs.

Given the present large discrepancies existing at the world level between a tendency to overproduction sharpened by North-South competition and a persistent underconsumption in developing countries, such a technology has, unfortunately, not received due attention, despite the fact that it opens also interesting channels for South-South technology transfers.

2. Products for which LDC's participation is relatively important (above 15 % but less than 50 %).

In that category two types of products do present a special interest.

The first type does concern the basic staples including new staples. The group meat-poultry-cereals milling does represent at the same time a determining share of the basic staples in LDC's, and an important part of world output. Even if these products are always recensed under different statistical categories, they need an integrated approach, given not only

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(1) N. JEQUIER, The scaling down of modern technology : crystal sugar manufacturing in India in Appropriate technology problems and promises, OCDE, Paris, 1976.

their traditional interlinkings, but mainly because of the new articulations which have appeared recently between them in many developing countries.

The second type does concern the export and branded foods, through the role of beverages industries. All the sections of these industries have been very dynamic in the last twenty years in LDC's. On one side local processing of traditional exported tropical beverages has been undertaken in some producing countries. On the other side, branded beverages for local markets, especially soft drinks, have known a particularly rapid expansion, and have not been constrained, like other branded foods, by stagnant mass consumption.

A. Meat-poultry-cereals

Meat production in developing countries, poultry included, does represent about one third of world meat production. But given the population growth rates, meat production per capita, poultry excluded, has stagnated in developing countries in the last twenty years. In the mid-seventies, meat consumption per capita was 15 % of the level reached in developed market economies and 40 % of the level reached in developed planned economies. For beef, veal and pork meat, which together represent 75 % of world meat production, LDC's growth rates (respectively 1,8 % for beef and veal, 2,5 % for pork) were less than in developed economies, both market and planned (1). In these latter countries, meat consumption per capita has been stimulated at least until the beginning of the eighties not only by rising real incomes for large segments of the population but by a specific set of elements which contrast sharply with the evolution in LDC's.

In DPE's meat consumption was fostered through rapid urbanization and deliberate government policies, aiming at a more balanced mass diet, including large imports of corn to expand meat production, when required.

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(1) ONUDI, Projet d'étude mondiale des agro industries, 1975-2000 UNIDO/ICIS. 65, 1977, p. 61-66

In DME's meat consumption has not been stimulated by the urbanization growth, but mainly through an intricated set of interdependent factors. On the supply side, production systems have been completely transformed in one generation, and meat production has become essentially an industrial type operation, able to produce a middle-grade standard meat product, and which was offered an ever expanding mass market. Mass consumption was stimulated simultaneously through changes in tastes and by changes in domestic/working times ratio, leading to give a preference to dishes simple and quick to prepare.(1)

In LDC's meat production growth rates have been largely inferior to the urbanization growth rates. As beef, veal and pork are concerned,one can not detect, noticeable government efforts to develop mass consumption. In Africa and Latin America, they have even been under the population growth rates : by 20 % in Africa and 10 % in Latin America.(2)

Therefore expansion has been limited to urban high-income and middle income consumers, which constitute the sole engine of market demand.

It is consequently not surprising to see that meat production is the more developed in Latin America countries where large urban markets of this type do exist. At the end of the 1970's, Latin America beef, veal and pork production represented 4 times the African and Asian productions (Table 16).

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(1) CNUCED, L'industrie alimentaire dans les pays en développement : quelques tendances récentes en matière de transfert et de développement de la technologie,
TD/B/C.6/66, 1980, p. 4-14

(2) FAO, Production Yearbooks 1970, 1974, 1980.

Table 16. Evolution of meat production (poultry excluded) by world regions 1960-1980

Regions and countries	Production index				Share of world output (%)	
	1961-65	1969-71	1974-76	1978-1980	1961-1965	1978-80
Africa(developing)	100	124	121	143	2.9	2.6
S.andE.Asia	100	125	138	166	2.6	2.7
Middle East	100	127	143	175	1.8	2.0
Latin America	100	120	125	150	11.9	11.0
China	100	122	124	190	15.0	18.1
Japan	100	201	278	366	0.8	1.9
USSR	100	135	160	160	13.2	13.5
USA	100	120	121	123	22.1	17.5
Eastern Europe	100	120	159	168	7.7	8.4
Western Europe	100	125	140	158	22.0	22.2

Sources : FAO Production Yearbooks, 1966, 1970, 1972, 1976, 1980.

These productions have expanded mainly in large Latin American countries where rapid industrialization has increased income inequalities, and with rapidly growing high income and middle income urban markets. At the end of the seventies, 3 large Latin American countries (Argentina, Brazil, Mexico) totalled 50 % of beef production of all developing countries and their beef exports represented only 2 % of their production (1). These figures do conceal an important redistribution between Argentina (which was an important exporter in the past but which has seen its contribution to world exports dwindle), and Brazil and Mexico, inside which internal demand was the principal factor of growth.

Despite this evolution, and despite their low meat consumption per capita, LDC's were still contributing, at the end of the 1970's, for about 17 % of beef world exports, which do represent only 5 % of world production. This contribution came mainly from small countries where beef exports

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(1) FAO Production Yearbook, 1977, 1979
FAO Trade Yearbook, 1977, 1979
World Bank, Commodity Trade and Price Trends, (1978 edition)

represented a large share of production. Countries like Botswana, Costa Rica, Guatemala, Honduras, Nicaragua, contributed for only 0,1 % each to world beef production, but beef exports represented between 20 and 50 % of their production, and for some of them, constituted an increasing and non negligible part of their total merchandise exports. These trade flows do concern mainly for the moment, central American countries which export towards the United States meat which is utilized in fast-food restaurants.(1)

One has not to exagerate the present importance of that tendency, given its small weight in total world production. But if such a trend in the international division of labour had to accelerate, it would certainly accentuate existing misallocations in the use of world ressources, particularly when it involves small countries with low level of protein consumption per capita, and with huge peasant population densities which have only a limited access to land availabilities given the structures of land ownership. (2)

In large Latin American countries where internal demand has been the main engine of growth, meat production techniques have evolued more and more in the direction of methods used in industrial countries, as well in the field of cattle raising and feeding, than in the sector of slaughtering.

For instance, Brazil and Mexico do represent 50 % of LDC's animal feeds output, which itself does not exceed 5 % of world production. (3)

In the large Latin American NIC's, meat industry has thus recently

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(1) M. GARCIA, La expansion agroindustrial en el marco de la internacionalization de los mercados : el caso de la carne, CETRAL, Paris, 1980, 33 p.

et D. SLUTZKY, L'agro-industrie de la viande au Honduras, Cahier de Recherche n° 5, CETRAL, Paris, 1979, 106 p.

(2) G. ARROYO, S. de ALMEIDA, J.M von der WEID, Transnationales et agriculture, Amérique Latine, n° 1, 1980, p. 45-81

(3) U.N., Yearbook of Industrial Statistics, 1979, vol.II. ISIC 312201

emerged as a capital-intensive branch of agro-industries closely linked with the industrial system and with demand of the priviledged segments of the urban population. But as it is largely disconnected with the traditional peasant economy, these islands of modernity can contribute heavily to an accelerated marginalization of the peasantry.

In other contexts, accelerated industrialization and urbanization can however be associated with other types of relation between expanding meat production and peasant agriculture. In China for instance, the last twenty years have seen an extremely rapid growth of pork meat production, which is typically a peasant cooperatives production. Pork meat output has augmented by 2,5 times in twenty years and has increased from 68 % to 76 % of total meat output between 1960 and 1980 (1). Chinese pork production does represent now more than 80 % of total LDC's pork output.

Chinese experience does tend to show that institutional arrangements can play a very important role to promote certain types of meat production which can at the same time provide low cost meat for mass consumption, and generate employment and incomes in rural areas, and utilize efficiently agricultural hangovers. Pork production can meet these targets in a cooperative framework but does require a set of interdependent elements in the rural areas, which can only succeed when conditions of integrated rural development are implemented. (2)

As most of the time conditions have not been given real priority in LDC's, the possibilities to articulate peasant production with agro-industry, for mass consumption have been largely underexploited.

An other consequence of this situation is the weakness of meat-processing industries in LDC's, as they are mainly based on pork meat. In the mid-seventies, production of processed pork meat (bacon, ham, sausages and

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(1) FAO, Production Yearbooks, 1970, 1980

(2) Chinese rural institutions and the question of transferability, World Development, May 1978, p. 583-608 et 631-646

lard) in LDC's did represent about 10 % of world total.

For meat conserves the proportion was about 6 %. Some overoptimistic forecastings made in the 1970's predicted a substantial increase of LDC's share for 1985. But in fact, meat conserves output has declined in almost all developing regions between 1974 and 1980, a period during which meat conserves production has increased spectacularly in EEC countries. (1)

In recent years, the only meat production which has expanded vigorously in LDC's is poultry production. Poultry production growth rates have been substantially higher than population growth rates and thus poultry production per capita has increased very much, in sharp contrast with the evolution of other kinds of meat. In all developing regions, poultry contribution to total meat production has increased impressively, a phenomenon which occured also in developed countries but in a less important fashion. (Table 17)

Table 17. Poultry production : 1960-1980, evolution and contribution to total meat output.

Regions and countries	Evolution of output				Contribution to total meat output by region(%)	
	1961-65	1969-71	1974-76	1978-80	1961-65	1978-80
Africa	100	153	173	279	13	22
Latin America	100	198	268	455	8	20
Middle East	100	184	254	416	15	29
S.and E.Asia	100	169	200	282	18	27
China	100	104	108	121	17	13
USA	100	133	141	184	24	33
Western Europe	100	173	220	269	12	20
USSR	100	138	203	268	8	13

Sources : FAO, Production Yearbooks. 1970, 1976, 1980.

(1) U.N. Yearbook of industrial statistics, 1979, vol. II, ISIC 311128.

The fact that China is the sole exception to these huge rates of growth is linked with the nature of poultry developments in the last twenty years. One has seen that mass consumption in China was heavily dependent upon pork meat produced in a cooperative peasant framework. On the contrary, poultry production in most LDC's has been mainly developed as an industrial production, completely disconnected from peasant agriculture. It has evolved through transfers of large-scale technology from developed market economies where it was established since the end of World War II. In many cases, poultry production in LDC's is managed by large foreign firms : 8 leading feed and poultry firms based in the United States currently have at least 18 affiliates in poultry processing or broiler production in developing countries. (1)

In many countries firms are also present through contracts with local governments to manage centralized poultry factory-style production systems.

Finally, in some large NIC's large local firms have themselves undertaken projects of industrial poultry production.

But in all cases, production is based upon animal feeds and broilers produced in large scale agro-industrial units. In many cases, poultry production has even been developed as a forward linkage effects of imported corn and cereals milling. This has been deliberately encouraged by some cereals exporting developed market countries. For instance, the U.S. department of agriculture has in many cases, given credit support to U.S. transnational companies to establish milling plants, animal feed plants and poultry processing plants in LDC's. (2)

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(1) Centre on Transnational Corporations, Transnational corporations in Food and Beverage Processing, U.N., New York,1981, p. 26

(2) UNCTAD, L'industrie alimentaire dans les pays en développement, op. cit. TD/B/C.6/66, p. 18
For instance, Cargill's Korean feed affiliate was established in 1969, in a period when the Republic of Korea obtained large subsidized corn shipments. Ralston Purina also set up a feed-processing affiliate in the Republic of Korea to take advantage of corn sales.

Poultry production has thus been expanded for mass consumption in relation with a growing dependency upon imported basic agricultural products in developing countries. Its transformation in a large factory-style system, dominated by foreign inputs and technology, has been fostered by the huge difficulties encountered by local agricultures, or even their inability to meet the mass market demand for basic staples in ever expanding urban centers. In most cases these difficulties have institutional roots (price policies, credit structures, landownership problems), and could only be overcome through appropriate institutional arrangements.

Because insufficient efforts were made in this direction, the deepening agrarian crisis has led to the lessening of ties between the local food-agricultural system and the urban-industrial system. The latter has choosen the easy way of a growing dependence upon foreign basic staple imports, an evolution which has entailed important shifts in food consumption pattern in the direction of their westernization, such an evolution being naturally encouraged by the large cereal exporting Western countries, like the U.S.

That evolution has not only weakened the exchanges between local agriculture and industries, but the forward linkages of these imports like the poultry production have rendered still more dim the prospects of a future articulation between industrial-urban growth and agricultural growth.

Because they are based on a technology generated in cereal surplus countries (where only 10 % of total food consumption is based on direct consumption of cereals, but 2/3 is based on indirect consumption of cereals like meat and poultry), industrial poultry production systems are particularly inadapted to present ressource endowment of LDC's, where cereals deficits for human needs are increasing. They tend simultaneously to perpetuate food dependency for the future and to forbid the emergence of national agro-food systems based upon local agricultural inputs and articulated with the national industrial system.

This is a supplementary evidence to discard the view along which the evolution of agro-food systems in LDC's would repeat more or less their evolution in DME's.

In LDC's, spectacular progresses in agro-food industries can be the more important precisely where the agrarian crisis is the more important and the food dependency is growing. This is typically the case of cereals industries like flour milling and bakery.

Table 18 does compare the situation in Africa and in Latin America. It shows that wheat flour production based mainly on imported cereals has expanded vigorously in Africa in relation with the growing gap between roots and local cereals production and population increase.

Table 18. Cereal production, wheat flours and other meals, and cereals derived products in Africa and Latin America 1960-1980

	1961-1965	1969-1971	1974-1976	1978-1980
Africa (developing)				
Population	100	121	140	160
Root & pulses	100	118	128	139
Cereals	100	121	126	127
Wheat flour	100	141	191	267
Other meals	100	101	125	200
Bakery products	100	130	163	196
Biscuits	100	133	180	185
Latin America				
Population	100	123	140	159
Root & pulses	100	133	122	122
Cereals	100	132	150	160
Wheat flour	100	117	124	158
Other meals	100	170	291	206
Bakery products, Biscuits	100	100	130	191

Sources : FAO Production Yearbook 1970, 1974, 1976, 1980.
U.N. Yearbook of Industrial Statistics, 1974, 1979, vol. II.
ISIC 311601, 311604, 311607, 311701, 311704, 311707.

If the dependence of Africa as a whole upon increasing wheat imports is a particularly striking fact, a growing number of developing countries in other regions are in the same situation. Import dependence has been encouraged by the concessionary price programmes of exporting countries. However, availability under such subsidies is declining, and developing countries must absorb increasing amounts of commercial supplies. With regard to wheat, for example, United States shipments under assistance programmes declined from 41 % in 1970 to 18 % in 1978 while the value of wheat imported by developing countries rose from dollars 5.3 billion to dollars 8 billion. (1)

Import dependence is linked with choices made by government because of the difficulties encountered to adapt local agricultural systems to growing population and ubanization. But these choices made under short-terms constraints have long term and irreversible consequences.

Harbours infrastructures, storage facilities, milling capacities and technology have been adapted to cereal imports, at the price of heavy investments, often partly with financial assistance of the surplus countries. The conditions for continuous dependence are thus created, and progressively all the basic staple food system of the recipient country is invaded by imports. Tastes and consumption habits are modified slowly in the urban centers, and it becomes progressively impossible to modify the evolution. (2)

Important technological progresses have been made in the 1970's to

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(1) FAO, "Agriculture : towards 2000", 1980, p. 201-202

(2) J. BLANC, Malnutrition et sous-développement, Grenoble, Presses Universitaires de Grenoble, 1975.
W.J. CARBONELL and H. ROTHMAN, "An implicit food-policy : wheat consumption changes in Venezuela" Food Policy, n° 2, 1977.

produce composite flours with local inputs, in which wheat flour is mixed with other starches and protein from domestic raw materials (e.g., millet, cassava), in order to reduce imports of wheat and lower the price of bread. Many fruitfull experiences have been made in this direction in India, Nigeria, Senegal and France. But they have not been incorporated on large scale into production lines, because the baking and milling industries have been developed to depend solely on imported wheat, and because many LDC's governments have given local staple production programmes less priority than would have been the case had subsidized imports not been available. (1) When one analyze the development of the meat-cereal complex in developing countries, one has therefore to be very careful. Success stories, like the poultry industry and cereal milling industry, are at the same time failures stories. They are the symbols of the growing desarticulation of the agro-food systems of developing countries, and of their growing dependence. Impressive growth rates in such industries, have as counterparts, accelerated marginalization of large sections of the local peasantries and growing inability to rebuild an articulated agro-food system. (2)

The meat-poultry-cereal complex is however the sector where there is the most urgent need to give appropriate attention to the role of small-scale rural industrialization in order to build integrated national food system, rooted upon the valorization of local staples, and able to generate employment and incomes in rural areas.

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(1) G. GHERSI et J.L. RASTOIN, Firmes multinationales et systèmes agro-alimentaires dans les pays en voie de développement, Paris, OCDE, Centre de développement, 1981, 87 p. give an extensive bibliography on this subject.

(2) P.J. ISENMAN and H. SINGER, "Food aid : disincentive effects and their policy implications" Economic Development and Cultural change, January 1977;

L. DUDLEY and R.J. SANDILANDS, "The side effects of foreign aid : the case of PL 480 wheat in Colombia", Economic Development and Cultural change, January 1975.

B. Beverage industries.

Beverage industries in developing countries can be divided in two categories : traditional tropical beverages (coffee, cocoa and tea) and new branded beverages, like carbonated and soft drinks and beer.

In the field of traditional tropical beverages the most important changes have occured in the institutional organizations of markets, i.e. the development of marketing boards or State sponsored agencies to control producers prices, export receipts and generally increase State revenues. International markets and processing plants, mainly in developed market economies, are largely dominated by some large transnational companies. Four American, three British and two Swiss companies produce 80 % of world chocolate production; as far as all cocoa products are concerned 4 firms do represent more than 60 % of the country production in Netherlands, Sweden, Italy and the United States. (1) In the coffee industry, the 8 largest processers control 55 to 60 % of world sales : in powdered coffee products, the 4 largest firms count for an average of 90 % of sales in Western European countries and Japan. (2)

These constraints have determined the patterns and limits of processing operations which have been undertaken in developing countries, to increase the value added of exports. Countries which have been the more dynamic in the production of coffee and cocoa have at the same time laid down the foundations of a processing industry, mainly Brazil, Ivory Coast, Kenya, Ecuador and Cameroon.

In the field of cocoa products Table 19 shows that there has been an important redistribution of cocoa beans production between Latin America and Africa in the last twenty years. Latin American relative expansion is due mainly to Brazil. African regression is due to the crumbling of Ghana and Nigeria production which has not been compensated by the

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(1) UNCTAD, Marketing and distribution system for cocoa, TD/B/C.1/164, January 1975.

(2)"Structure and prospects of the world coffee economy", World Bank Working Paper n° 108, Washington, June 1975.

exceptional growth of Ivory Coast.

Ivory Coast is also, with Cameroon, responsible for the enlargement of Africa share in the world output of cocoa powder and butter. Total share of developing countries has climbed from 17 % to 22 % between 1960 and 1980 for these two products. In the field of chocolate production that share has grown from 3 to 9 %

In the field of coffee products, the most significant change is the growth of soluble coffee production in some developing countries. The most vigorous expansion has been realized in Kenya and Ivory Coast where combined production climbed from 5.000 T in 1970 to 76.000 T. in 1979. Brazil had reached a production of 50.000 T by the mid-1970's. The importance of these figures can be measured by the volume of production in the U.S.A., which evolued from 85.000 to 115.000 tons in the 1970's, or in Federal Rep. of Germany, where it passed from 19.000 to 22.000 tons during the same period. (1)

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(1) U.N. Yearbook of Industrial Statistics, 1979, vol. II ISIC 312101

Table 19. Cocoa production : evolution of raw and processed products 1960-1980

	Evolution of total output				Share in world output	
	1961-65	1969-71	1974-76	1978-80	(%) 1965	1978-79
1.Cocoa beans						
Africa(developing)	100	118	105	101	74	61
Ivory Coast	100	179	188	298	9	21
Cameroon	100	162	125	143	6	7
Nigeria	100	118	100	77	17	11
Ghana	100	96	89	60	36	16
Latin America	100	112	159	165	25	36
Brazil	100	122	193	193	12	19
S.and E.Asia	100	157	357	500	1	3
2.Cocoa powder and butter					Share in regions output	
Africa	100	135	176	174	10	14
Latin America	100	115	115	127	6	6
S.and E.Asia	100	300	350	400	1	2
EEC	100	115	123	133	40	44
North America	100	100	101	101	43	35
3.Chocolate					Share in regions output	
Africa	100	125	175	325	neg.	1
Latin America	100	230	241	243	3	5
S.and E.Asia	100	488	660	750	neg.	2
EEC	100	148	170	193	43	57
North America	100	100	100	100	53	35

Sources : U.N. Yearbook of Industrial Statistics, ISIC 311907, 311910, 311913.
FAO, Production Yearbooks, 1970, 1974, 1980

Changes in the distribution of processed products have thus been more rapid in the field of coffee products than for cocoa products. In most cases, such a move has been realized through advantages granted to transnational companies dominating the world market in order to attract their investment in the country. Sometimes, the prevailing power relation does entail exorbitant advantages for the transnational companies, which minimize the real benefit for the recipient country. In Nestlé's operations in Kenya and the Ivory Coast, for example, technical and trademark fees equal to or larger than declared profits and dividends were remitted. Nestlé's investment in soluble coffee processing in the Ivory Coast was encouraged by an exemption from raw-coffee export taxes; in 12 years the value of this exemption totalled dollars 4 million, or 20 times the initial capital contribution by Nestlé which was dollars 200.000. (1)

When such exceptional advantages are not conceded, transnational companies are reluctant to make effective investment projects. It has been for instance the case in Cameroon, where soluble coffee projects by some transnational companies have been delayed because the government refused to provide the raw coffee at a price below the world price. (2)

There have also been efforts by developing country coffee firms to enter directly into foreign markets through downstream integration and sales of processed-coffee concentrates. In 1976, for example, Hills Bros, a United States firm with about 6 per cent of the national market was acquired by Brazilian investors. Brazilian producers of soluble coffee have sought to expand their sales in the United States in the 1970's, but they have encountered industry opposition which affected negociations on the International Coffee Agreement. (3)

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(1) J. MASINI ed. Multinationals and Development in Black Africa, Farnborough Saxon House, 1979, p. 113-145.

(2) Les industries du café et du cacao en Afrique Noire, Europe Outre-Mer, novembre 1980, p. 47

(3) Centre on Transnational Corporations, ST/CTC/19, op. cit., 1981, p. 85 and 120

Despite the great difficulties to conquer stages of downstream processing by acquiring technology and access to markets, the prospects for further industrialization in these sector are rather good for developing countries. Cocoa powder, cocoa butter and chocolate have known a very high rate of growth in the last twenty years, especially in developing countries and in developed planned economies. (1) The technology being mastered already by some developing countries, appropriate institutional arrangements could lead to South-South technology transfers and also to technology research in order to develop a better articulation between sugar cane and cocoa industries on one side, and peasant agriculture on the other side. As far as markets are concerned,prospects seem particularly good in South-South and South-East relations.

Another category of beverages geared only to the internal market has known a spectacular growth in developing countries in the last twenty years. Soft drinks and mineral waters have expanded at an average rate of almost 8 % a year in developing countries, which produce about 25 % of the world output.

These industries are deeply marked by the activities of some large transnational corporations. In soft-drink concentrates industry, 8 leading firms have 52 affiliates in developing countries, and roughly 25 % of their total sales are generated in developing countries. Most of the time, the system of licensing is prevailing and local owners of bottling plants purchase syrups, concentrates, technical support and rights to trademark use, and share the costs of advertising and promotion.

National competition is relatively important in some developing countries and efforts to protect these producers as well as to control capital and profit repatriations have sometimes led to problems between the transnational corporations and local governments. (2)

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(1) ONUDI, Projet d'étude mondiale des agro-industries, op.cit. p. 95

(2) Centre on Transnational Corporations, ST/CTC/19, op. cit. 1981, p. 65-67

Table 20. Soft drinks, mineral waters and beer production in developing regions 1965-1980

	1965	1970	1975	1979	Share of developing regions % 1979
Africa (developing)					
Soft drinks	100	148	250	336	
Mineral waters	100	205	448	615	
Beer	100	135	232	295	
Latin America					
Soft drinks	100	231	277	333	
Mineral waters	100	127	130	137	
Beer	100	110	171	197	
S.and Oriental Asia					
Soft drinks	100	155	-	-	
Beer	100	226	297	511	

Sources : U.N., Yearbook of industrial Statistics 1974
ISIC 313404, 313401

Despite their great dynamism, soft drinks and beer industries are arousing many important problems in developing countries.

On one side they are generally heavily dependent upon imports (for concentrates and malt) and they provide only limited outlets for local agriculture. Transnational corporations, and even competing local firms (for example in Brazil, Mexico , in Africa and South Korea) are using very capital intensive technology and the product technology is built around the ressources of the developed countries. With this initial constraint, local sourcing in the host country is often problematic because of the lower prices of imported raw materials or climate differences.

On the other side, soft drinks and beer, produced by transnational corporations affiliates or by national companies are typical branded foods, with a high percentage of costs devoted to marketing (in Mexico for soft

drinks the average is 15 % of sales revenues) with a high income elasticity, and with a very high price/nutrient ratio. They have become almost the only mass branded foods in developing countries and their consumption does increase despite deepening income distribution inequalities (beer in Zaïre being an extreme example) (1)

There is thus an urgent need for promoting local drinks, using local staples and adapted technology, and with a higher nutrient/price ratio. Some efforts have already been done with success. For instance, Libya has developed a kind of national bitter soda, and Ivory Coast has developed a project of pineapple wine (6 millions bottles a year). (2)

But other possibilities do exist from a technological point of view (vegetal milks, lactoserum, cassava beer), which could provide soft drinks enriched with soluble proteins, and they constitute one of the important way of applied research for the future in the framework of South-South scientific and technical cooperation.

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(1) M.G. SCHATZBERG , Politics and Class in Zaïre, Bureaucracy, Business and Beer in Lisala,
Africana Publishing Company, New York, 1980.

(2) Les conserveries en Afrique, Europe Outre-Mer, novembre 1980, p. 43

Some concluding remarks.

The above general survey of main agro-food products in developing countries does confirm the need for a careful and specific approach of the dynamics underlying the growth of these industries.

The different agro-food branches are not articulated together in the framework of a national process of development where they could constitute a kind of bridge between the general industrialization process and the progressive modernization of agriculture, like it was more or less the case historically in present developed market economies.

The different agro-food branches do obey to different logics of growth which can be largely explained by the stages of the international division of labour impulsed by DME's and the effects these stages have imposed upon agricultural changes, urbanization rates, and industrial growth in developing countries. These are basic general constraints which can be more or less affected by policy choices made by LDC's governments.

Export foods have been developed for international demand, with no link at the first stages with the national markets, and technologies have been profiled according to the needs and norms of the developed economies. In the last twenty years, the growth of urban demand in LDC's has competed with international demand for some traditionally export raw materials like sugar and vegetable oils.

But imported capital-intensive technologies have continued to determine the conditions of production. Combined with inappropriate price policies this has led in some cases (vegetable oils in Africa) to an inability to exploit growing demand, both national and international; in other cases (sugar) the choice of technology does lead to overproduction and does not contribute to create the conditions for further growth of internal demand.

In both cases, the links with local agriculture, if they are evident, do not fully exploit the potential of peasant agriculture participation,

in terms of employment and incomes, an inappropriate choices of industrial technology do lead to inappropriate choices in the field of agricultural related projects.

Such a disarticulation is particularly striking in the sector of branded foods and of the new staple foods, when they have led to import agricultural products, which hinder, in one way or another, improvement and valorization of local agricultural products, and lead to further marginalization of peasant agriculture.

Such a situation does lead to think that generally one has given too much exclusive importance to foster growth of agro-food industries in LDC's in terms of their increased participation to total world output. One has not paid enough attention to the fact that in many cases, in the present absence of articulation between different agro-food industrial branches and the rest of the national industrial system, and above all with national and peasant agriculture, accelerated growth will simply mean accelerated disarticulation, further marginalization and negative effects in terms of employment, income distribution and global development.

Further explorations are required to see how these articulations have emerged and are functionning in the present LDC's situations, implying the role and responsability of different economic operators and social agents : the State, national enterprises, transnational corporations, international organizations, and local farmers and peasants.

This is the only way to see how to improve in the future a better integration of agro-food industries with the rest of the national industrial systems and with national agriculture, and to look at the role that small-scale rural industrialization could play in that perspective.