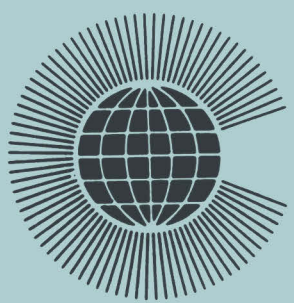
Commonwealth Economic Papers: No. 10

The Expansion of Processing in Developing Countries and International Policy Requirements



Commonwealth Secretariat

COMMONWEALTH ECONOMIC PAPER: No. 10

THE EXPANSION OF PROCESSING IN DEVELOPING COUNTRIES AND INTERNATIONAL POLICY REQUIREMENTS

(Paper prepared for the Commonwealth Secretariat by Professor H.W. Singer, assisted by Juliette Stephenson, Institute of Development Studies, University of Sussex)

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PREFACE

A substantial proportion of the raw materials produced in developing countries is processed in developed countries and very little change is taking place in this location pattern of processing activity. It has been clear for some time now that in many cases economic considerations are not the determining factor in the pattern of location of processing and that among the many constraints to the development of processing in developing countries are unfavourable trading policies including restrictive business practices as well as factors related to underdevelopment. It is likely therefore that the removal of these constraints and the positive encouragement of processing could make a substantial contribution to economic development especially in view of the vast scope for increasing value added in raw material production in these countries.

Commonwealth developing countries are substantial producers of commodities and the expansion of domestic processing is therefore of significant importance to them. In the light of these considerations this study was commissioned from Professor Hans Singer with a view to identifying the constraints to the development of processing in developing countries, evaluating their importance and recommending remedial measures.

The study is intended to assist the developing countries in their industrialisation efforts and the international community in accommodating policies which could facilitate such efforts.

The Secretariat is grateful to Professor Singer and Juliette Stephenson for the substantial amount of work they have put into this study. It is hoped that the study will make a valuable contribution to the discussion of this important issue.

B. Persaud
Acting Director, Economic Affairs Division

October 1978.

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SECTION I

Evaluation of the Role of Expanded Domestic Processing in the Development Process

A variety of policy proposals and options have been put forward in recent years with respect to the role of primary commodities in the development process. This has been due to a number of factors which include a perceived failure of trade to act as agent of dynamic internal economic change; the many problems encountered with the level and stability of primary export revenues; the terms of trade of exporters of primary commodities; the fact that during the United Nations First Development Decade (1960-70) the position of LDCs generally worsened vis-a-vis the advanced economies, and in some respects even absolutely ;(1) an increasing pursuance of economic nationalism and emphasis on self-reliance. All these elements culminated in collective action at an international level, aiming at the establishment of a New International Economic Order. (2)

Among the proposals advocated are strengthened national sovereignty with respect to domestic national resources, measures to improve and stabilise export earnings (e.g. the UNCTAD Integrated Commodity Programme) and an expansion of domestic processing of local raw materials. Possible gains to accrue to LDCs are higher export earnings and greater stability in prices and earnings, greater unit value added, increased earnings from associated domestic sales, greater control of markets, domestic integration and linkages via indirect investment, the transfer and development of technology and indigenous skills, generation of employment opportunities - a considerable range of desiderata sufficient to focus attention on the processing potential. All the above accord with the declared international aim of restructuring world output, industry and trade in favour of LDCs which at present represent only about 7% of world industrial production. In particular, the Lima Declaration aims at a more even distribution between the developing and developed nations and states: the present share of LDCs"... should be increased to the maximum possible extent and as far as possible to at least 25% of total [industrial] world production by the year 2000." (3)

It is important to note that this is not a projection but rather the minimum acceptable level. One may furthermore emphasise 'the striking modesty of this proposal': for even on the extreme assumption that world industrial production remained static, this would mean a reduction of less than 20% in industrial output of the DCs spread over 25 years - not much more than that which was lost in the 1973-75 depression; and it would still mean per capita industrial production in LDCs at a level only one-sixth of that in the industrial countries. (4) This is not to say that this will be easy or even possible, implying under realistic assumptions a necessary growth rate for LDCs of 11.3% per annum (far higher than the International Development Strategy rate of 8%). However, it has been suggested (5) that subject to certain conditions this could quite plausibly be achieved as a result of export-led industrial growth.

The realisation of the 25% target has fundamental implications for the world pattern of production and trade; necessarily there are consequences for an expansion of processing capacities in LDCs. In 1964 the first UN Conference on Trade and Development was held with the aim of moving towards a more satisfactory international division of labour and emphasis was laid explicitly upon the importance of an expansion of domestic processing of natural resources, partly with the aim of diversifying the LDCs' export base. A dozen years later, the fourth UNCTAD conference in 1976 which proposed an Integrated Programme for Commodities, included as one of five major elements "... the expansion of processing in developing countries."(6) This statement is reiterated by many international organisations, including the UN 'Programme of Action on N.I.E.O.', UNIDO, OECD and FAO:"... particular emphasis should be given to projects that increase industrial capacity and add to the value of local production by processing products in the country of origin."(7)

Despite all such declarations and intentions the present situation is still one where primary commodities account for approximately 75% of LDCs' export earnings although in fact this only represents 40% of world trade in primary goods.(8) And while a certain restructuring of LDC exports in favour of processed and manufactured products has occurred their overall share in world production and trade has been declining.(9) Manufactures and processed goods are playing an increasingly important role in world trade and the share of LDCs in this trade is only about 18%. Moreover, this trade is heavily concentrated among a few medium-income NDCs (newly developing countries). Thus LDCs remain heavily dependent on their raw material exports and the need to diversify is all too evident.(10)

Processing, a type of industrialisation - indeed a "resource-based industrialisation strategy"(11) - forms the main step between the extraction production of natural resources and their final consumption. It therefore provides the natural link between the essential role that primary commodities now play in the majority of LDC economies, and the essential role that industrialisation must hold in the future.

Industrialisation is a key element in the development process; it holds possibilities of diversifying production for domestic and trade purposes, providing employment, and furthermore leads to "... new patterns of parity and mutuality of interdependence."(12) An evaluation of the role of industrialisation per se is outside the scope of this report but it must be emphasised that an assessment of an expansion of domestic processing in the 'development process' must necessarily be undertaken in the light of the objectives of such a process: the 'goals' of the development strategy provide the criteria against which an evaluation must be made.

Throughout this report the underlying concern is with the extent to which an expansion of processing might play a positive role in the overwhelming need to alleviate poverty, provide employment opportunities, improve the distribution of incomes, increase both national income and government revenues and lessen the dependence of LDCs in the present world economic order.

Our assessment concerns itself with the added value that LDCs may obtain by processing their own raw material supplies domestically; the linkage effects - both in the narrower sense of induced investment and wider sense of employment opportunities generated and the transference and development of technology, and further with the resulting satisfaction of 'basic needs' and links between agriculture and industry, and particularly, additional opportunities for rural development.

LDCs face a number of constraints in attempting to undertake processing domestically. Many of these constraints are identical with more general obstacles to other types of industrialisation and indeed 'development', for example chronic lack of capital and foreign exchange. Here we naturally are more concerned with the obstacles that more specifically confront domestic processing industries in their attempts to establish themselves, develop or expand.

The implications of 'resource-based' industrialisation strategies are manifold and the appropriateness of such strategies will depend upon many factors. These include the institutional factors which determine the ability to absorb and invest the surplus generated in primary commodity production as well as the value added in processing; the role played by foreign investments and by international institutions; the nature of the resource, size of reserves, whether renewable/non-renewable; the dependence of the economy for foreign exchange on the raw material exports and so on. All these factors determine the scope for and the possible gains from such a resource-based strategy.

The focus of such a strategy of resource-based industrialisation may be on the utilisation and processing of domestic resources for home consumption and local markets, or rather towards an 'export-oriented' strategy. It could also, more rarely, be based on the processing of imported materials for re-export as processed goods or semi-manufactures, e.g. export processing zones. It is the basic aim of any strategy to create an integrated and diversified production base, which in turn fully utilises domestic resources and is responsive to domestic or external demand and needs. However all LDCs are necessarily part of the global economy, forming an interdependent system where both advanced and poor countries possess essential resources and have (or wish to develop) processing facilities.

The feasibility of industrialisation geared totally toward self-sufficiency is somewhat unrealistic, particularly for smaller and poorer countries. On the other hand, not only is the international system in a state of crisis but also the situation is one of unequal bargaining strengths, manifest in the low share of LDCs in world trade, particularly manufactures. The choices between relative self-sufficiency and relative international integration will determine action in the realm of processing.

Manufacturing and processing is playing an increasingly important role in world trade and almost all the raw materials produced in the world undergo some degree of transformation, that is to say 'processing' within the producing country. Estimates based on input-output analysis, for agricultural production, show this may be as much as for example 81% in Japan but ranging down to 50-60% in many other countries.(13) The degree naturally varies among commodities, a fairly large proportion of food being consumed raw or with very little processing; only about 30% of fishery production is consumed fresh and 50% of forestry production processed - the rest almost entirely being consumed as fuel.

Classification of processing techniques and operations is fairly straightforward, (14) particularly in the case of food processing industries which are more homogeneous in the sense that all products have the same end use; processing of perishable foods is mostly for preservation; preservation techniques are similar over the whole range of commodities. Non-food processed products have a variety of end uses and almost all require a high degree of processing, which in most cases follows a definite sequence of operations. The basic processes encountered for minerals are smelting to remove impurities, refining and semi-fabricating operations.

Whilst classification of processing 'operations' is fairly straightforward, classifying 'processed' products is definitely not; there is an urgent need for a standard definition; treating different definitions as interchangeable can have serious and misleading consequences.(15) Presently there is no clear operational definition to establish whether a commodity belongs in the 'primary', 'semi-processed', 'processed', 'manufactured' or 'semi-manufactured' category. The UN Classification(16) states quite simply that "... if a commodity is <u>not</u> defined as primary, then it is classified as processed", thereby ignoring <u>any</u> distinction between 'processed' and 'manufactured' commodities.

The Standard International Trade Classification (Rev 2) divides all goods entering world trade into ten sectors and the most commonly used short-cut or 'proxy' definition is that sections SITC (0-4) represent primary commodities and sections SITC (5-8) represent manufactures. This means that all processed foods, including beverages, tobacco and oils and fats, are classified as 'primary products' and conversely no distinction is made between processed and manufactured non-food products.

There are a number of generally accepted conventions which apply, whereby for example rubber processed to smoked sheet counts as a primary product whilst rubber footwear counts as a manufacture.

Given the lack of an authoritative definition, we would adopt for the range of selected significant raw materials definitions for their 'primary' and 'processed' state, (17) deriving mainly from various UNCTAD, FAO and OECD works combined with a general commonsense or intuitive approach. As soon as a raw material undergoes any degree of fabrication at all, this product would be termed 'processed' and the commodity considered to be no longer in its primary state. At the other end, as long as the single raw material represents a major input to the fabricating operation this would be called 'processing' but when this is no longer the case, the activity would be

considered as 'manufacturing' and the product as 'manufactured'. Generally, for non-food commodities this corresponds to SITC Section 2, being treated as 'raw materials' and SITC Section 6 (minus Division 69 'metal manufacture') as 'processed' goods. For example, in the leather, fur etc. industry we would have:

Basic (Primary)	- SITC Div 21	- Hides, skins and furskins (raw).	
Processed	- SITC Div 61	- Leather, tanned and dressed furskins and leather 'manufactures', e.g. parts of footwear.	
Manufactures	- SITC Group 851	- Footwear	)
	848.1	- Leather clothing	) and others
	848.3	- Fur clothing	)
	831	- Leather travel goods)	

On the basis of classifications similar to these distinctions we find that generally the export market share of LDCs in processed commodities, as compared with primary commodities, declines sharply.(18) A typical situation being that of cocoa, where LDCs held (1973) a 100% share of the cocoa bean market, but only a 48.3% share in cocoa powder, paste and butter, and none of the market in chocolate. Another example is bauxite: LDCs account for nearly 80% of the export market for the raw ore, but have only a 5.2% share in the aluminium market and none at all in aluminium plate.

In these eleven commodity groups, LDCs accounted for 62.5% of raw material exports in 1970 (in 1974 almost the same proportion, 61.2%); in value terms this was US $15 billion out of a total of $24 billion. However, for processed forms, the LDCs' share was 15.7% in 1970 (US $2.5 billion out of $16.3 billion) and 20.8% in 1974.(19) Therefore four-fifths of all export trade in processed forms was in the hands of the developed countries.

The value of the raw materials at export represents a fraction, often a very small fraction, of the final value when the products are finally retailed; there is thus a large potential of added value to be obtained by LDCs if more 'processing' were undertaken domestically. Although probably not all the export market is available to LDCs for various reasons,(20) if LDCs had processed all their raw materials before export and therefore obtained the same share of the processed market as of the primary market (i.e. 62% instead of 16%) this would have given them an extra US$ 7.5 billion at 1970 prices - an increase in export earnings of 43%.

Therefore "... LDCs have an interest in carrying food processing as far as possible in order to maximise the value added in their agricultural exports."(21) This is also true for non-food agricultural products and especially for minerals, where the value added at successive stages of processing can be particularly large.(22)

This value added by domestically processing raw materials can mean substantial increases in export revenues and/or also savings of foreign exchange where previously imported processed goods can now be domesti-

cally supplied. LDCs often have to re-import their own raw materials in processed form, at great expense and loss of foreign exchange. However, not all the increase in value added will necessarily be a foreign exchange gain; for "... the burden in terms of relative foreign exchange outflows as a result of additional import-content cost (e.g. for machinery, chemicals, fuel and technical know-how) ..."(23) can be substantial.

Furthermore when the processing industry is controlled by foreign enterprises who provide and import all the capital-goods and other inputs, and supply all management and skilled labour, there will probably be a large 'leakage' of much of the additional export-income out of the economy and the benefits to the domestic economy may be minimal. This is likely to be the case in a highly capital-intensive industry which may generate few employment opportunities, reinforce the 'enclave' economy and worsen the pattern of income distribution.(24)

Despite these possible constraints on the contribution of the value added to the domestic economy, it appears to be the case that raw material processing industries make a proportionately larger contribution to value-added (and employment) in LDCs than in the industrialised countries.(25)

The opportunities that may be generated by an expansion of domestic processing can be further extended from the value-added component to the possible 'induced investment' in industries supplying inputs to the raw material processing industry and those using the processed good as an input. These types of multiplier effects are known as 'forward' and 'backward' linkages.(26) Forward integration by downstream processing is itself a forward linkage, and when raw material processing capacity makes the domestic production of other inputs viable, and stimulates the production of intermediate products, these are termed 'backward linkages'. These linkages refer explicitly to the direct (input-output) effects of establishing processing industries but can also be extended to 'final demand linkages', 'horizontal linkages' - i.e. investment in complementary goods, and 'negative linkages' where there are displacement effects. The additional employment in processing leads to higher incomes which in turn create multiplier effects when they are spent - another form of indirect demand linkage.

The extent of the linkage effects depends on a multitude of factors and not least on the nature of the raw material itself. For non-agricultural natural resources there is considerable potential for a high degree of linkages "...since some of the processes use considerable intermediate materials they establish permissive conditions for the stimulation of supply industries, as well as creating additional national value added ...".(27) Bauxite, for example, is one of the major industrial inputs and has potential to become the focus of an industrialisation strategy;(28) aluminium processing is likely to induce many intersectoral linkages such as the establishment of a capital goods and engineering sector and a variety of complementary industries both for domestic consumption and for export. Tin (29) is another example, with forward integration into smelting and pewter manufacture and backward linkage into timber, iron-castings, coal production, gravel pumping, local processing of petroleum products, etc.

However, the majority of mineral processing industries face the formidable obstacle presented by foreign investment which means " ... the possibility of utilising the resource as a basis of backward and forward linkage within the national economy is restricted by its already existing use as a basis of backward and forward linkages within the corporate economy."(30) Whilst foreign investment in LDCs is by no means confined only to non-agricultural resources, it is suggested that the actual opportunities for national linkage effects in LDCs may be " ... greatest in the case of agricultural processing and textiles."(31) Rubber, for example,(32) provides linkages into the 'off-estate' processing sector, rubber wood processing and the manufacture of rubber goods; backward linkages to agricultural chemical production, in particular fertilizers. Palm oil processing provides opportunities for further refining, kernel processing and soap manufacture; fertilizer production and improved local transport facilities may also be stimulated by way of backward linkages. Forestry industries provide a valuable base to an economy: sawmilling activities stimulate joinery, wood packaging, furniture production, and paper and board processing industries can lead to a number of conversion industries, like paper-bag manufacture, stationery, boxes and cartons.

Industries established using by-products or waste products can be of major importance; they are sometimes described as 'sideways linkages'. For example, wood residues can be made into fibre-board, particle board and pulp manufacture. Animal-feed industries similarly are based on a variety of by-products: whey, from milk processing industries; milling by-products; molasses, from sugar refining; (33) bone meal and so on. Other residues may be used for glues, fertilizers, etc. In some cases by-products actually provide an energy source; e.g. bagasse - by-product from the sugar industry - is primarily used as a factory fuel. There is potential for a number of by-products from the tropical fruit processing industries.(34) Thus for a whole range of raw materials, the establishment or expansion of domestic processing industries, can have wide-ranging linkage effects.

This narrow interpretation of linkages, i.e. generating new capital formation, can be broadened to include wider implications, in particular, the 'employment multiplier' and the consequences on technology transfer, as they relate specifically to processing industries. While the non-agricultural processing industries are typically capital-intensive, the later stages of processing - beyond smelting and refining - become more labour-intensive.(35) Furthermore, even where the process itself is capital-intensive, the production of other inputs through backward linkages may create substantial employment opportunities, and forward integration into transport, packaging and other related activities may likewise be significantly labour-intensive.

A striking example of processing linkages is evident in the banana industry; this is a commodity which ostensibly undergoes the very minimum of processing and yet over half the labour force employed by the banana exporting companies is engaged in 'processing' activities, like transport and boxing.(36)

Food processing is generally assumed to require an especially large labour force: "the development of the food processing industry, whether for domestic consumption or for export is a highly promising source of increased

employment."(37) There are nonetheless considerable differences, even within the food sector, of capital/labour ratios. Vegetable oil processing, for example, is highly capital-intensive, as are most rubber and paper processing industries.

When the primary material production is on a seasonal basis, the establishment of processing industries provides opportunities for continuing employment throughout the year. Processing industries may also be expected to increase the demand for and hence production of the raw material, which itself may be a highly labour-intensive activity. The fish processing industry in Peru made possible, and stimulated to a significant degree, the employment of fishermen. Naturally, the greater the direct linkage effects, the greater the possibilities for employment creation.

These linkages may also act as an inducement and incentive for the development of local indigenous technology. The greater the participation of LDCs in downstream processing, the more likely they are to overcome the handicaps presented by the 'whole package' nature of much technology transfer. When only very rudimentary processing is undertaken by LDCs there is little incentive to adapt the technology to more specific local requirements and it is easier simply to use what is available.

Hirschman (38) argues however that the very nature of raw material processing industries suggests a very big "technological jump" from the technologies required to produce primary products, to the processing techniques necessary at the next stages: "... milling, refining and other processing industries are usually 'technological strangers'" to the initial primary production and extraction stages.(39)

In some cases the very nature of the raw material necessitates that at least some basic processing operations are carried out immediately, and so must be integrated with the production stage. The technological characteristics of sugar cane, for example, require that it be crushed as soon as possible after cutting in order to maximise the sugar yield. When banana producers, in the early sixties, switched to a more delicate variety, this necessitated transporting the fruit without bruising, and not 'on the stem' as had previously been the case. Bananas have since been shipped in cardboard cartons, which as well as being easier to load and unload and requiring less space, have also had considerable employment effects via packaging and pulp and paper production.

Hirschman argues that in the two above examples it was only because of compelling technological characteristics that these forward linkages occurred and suggests that the less processing required the better from the point of view of integrating processing with primary production, because of the usually large 'technological gap' between primary production and processing which creates a difficult barrier between the primary producer and the processor. Conversely, where a great deal of processing is necessary, it it more likely that the integration of processing operations with primary production, since they are so 'technologically alien', will present insuperable difficulties. The issue of constraints to the transfer and adaptation of

technology required by processing industries is considered further in Section III.

'Location theory' is a useful form of analysis to assess more specifically the costs and benefits that might accrue to LDCs from locating processing industries domestically. Certain cost advantages may obtain for both local processors and foreign investors by locating a raw material processing industry at source; to the extent that LDCs and foreign investors have different objectives, naturally not all factors are relevant, or they may carry a different weight, thus possibly shifting the balance of locational choice.

Competitive advantage due to prevailing factor endowments may determine location, for example cheap labour and abundant raw material supplies. However, for transnational enterprises these factor endowments are not 'fixed', and many foreign investors can take advantage of quite different factor endowments than those at the disposal of the domestic processor.

The most important cost factor that both local and foreign investors must take account of, when producing for an export market, are transport costs. For some commodities, these costs are prohibitive to transporting in an unprocessed form and dictate that a certain amount of processing must be carried out domestically. For both tin and copper ore, the metal content is less than 1%, and for most other minerals transport costs form a substantial part of total costs. Furthermore "... most agricultural products either lose weight or bulk in processing so they can be transported more cheaply after they have been processed, or they are perishable and can more easily be transported in processed form."(40) The weight of the banana stalk, for example, accounts for 15% of the weight of the bunch, and when logs are processed there is a 30-40% residue. Costs of transporting may vary with the stage of fabrication, and for some commodities it may be easier to transport them in raw, unprocessed form, e.g. grains. Some processed goods may encounter transport problems regarding damp, heat, odour, etc., which necessitate specific types of transportation, like ventilated or refrigerated carriers.

Processing industries which are energy-intensive, like aluminium smelting, where energy costs are more than 50% of total production costs - and similarly high for copper, zinc and nickel processing industries - may be situated in LDCs if relatively cheap energy supplies are available. Environmental costs are another possible determining factor in locating processing industries in LDCs: "anti-pollution measures in developed countries might provide a stimulus to increase processing of raw materials in LDCs before export to developed countries."(41) (This question is considered in a separate appendix.)

Raw material processing industries are of fundamental importance to LDCs when they cater - as is often the case - for the 'basic needs' of shelter, clothing and most especially food. Processing industries make a direct contribution to increased food consumption; it is argued that the 'principal aim' of expanding production and trade in processed agricultural products "... is without doubt, that of meeting food requirements more satisfactorily."(42) Processing both transforms agricultural commodities into consumption goods and prevents wastage by preservation, thereby increasing the food supply;

already "... processed foods provide over two-thirds of mankind's total calorie and protein intake."(43)

Catering to meet the needs of the domestic market is usually the basis for the development of food processing industries. However, most raw material processing industries experience economies of scale and with only small populations, capacities are underutilised and production for the export market is necessary. Where small-scale processing is viable, this should be encouraged and fully utilised, particularly developing local products especially adapted to local conditions. Even within the food processing sector the importance of scale economies varies considerably.(44) Generally non-agricultural processing industries experience larger economies of scale; indeed one benefit that LDCs may gain from downstream processing in such industries is to lessen the exploitation of monopsony gains that accrue to buyers in the concentrated unprocessed mineral market. In the copper market, there are only a dozen independent copper smelters.

The importance of economies of scale should not be exaggerated and there has been a trend towards the development of small-scale equipment for use in processing industries, particularly agricultural processing. Light semi-portable sawmills; small oil expellers,hydraulic presses, sisal decorticators; canning equipment; rice, grain and sugar cane milling equipment, provide just some examples. This means a great deal more flexibility for in many cases processing plant can be expanded simply by the addition of further small units. In many instances there is a significant degree of technical flexibility and the capital/labour ratio is not fixed. In the food 'preparation' stage of many food catering industries for example, capital and labour are fairly interchangeable; functions such as weighing, cleaning, grading, slicing can be satisfactorily performed manually.

However, large markets are essential where there are considerable economies of scale; the vegetable oil, rubber and paper processing industries produce on a scale normally far in excess of domestic market requirements in the smaller LDCs. Therefore production for the export market is essential and this has been a major stimulus to development of various regional integration schemes between LDCs.

Domestic processing industries have a major part to play in the development process of many developing countries. Paradoxically it is often better to approach industrialisation through the primary role of agriculture,(45) thereby emphasising the essential link between the agricultural and industrial sectors. The interdependence of these sectors is manifest in the many interrelationships: agriculture usually has an essential role as a major provider of foreign exchange, with which to import capital goods and other inputs for the industrial sector; the agricultural sector provides a market for consumption goods and industrial products which are inputs into agricultural production; agriculture supplies the raw materials with which the processing industries may develop and in turn stimulate further production.

Processing industries can, and should, play a central role in rural development.(46) Rural areas in most LDCs account for 55-85% of total population and the agricultural sector employs 40-70% of the total labour force. But, with fast-growing populations, agriculture does not provide an

employment absorption rate to meet this growth, and the need to develop other rural employment opportunities is vital. At present, in India for example, only 10% of the rural workforce is engaged in non-farm activities and it is estimated that this must expand to 30% to absorb additional labour.(47)

The need to develop rural industries which use rural resources, cater for rural needs and use rural manpower, is all too evident; agro-based industries, and other resource-based industries, directly involve processing activities. While some processing industries must be located in urban areas because of scale, infrastructure and technical requirements, a variety of technical and economic possibilities exist with regard to the scale of rural processing industries. A milk plant, for example, may be one large dairy farm complete with its own processing facility, or conversely milk can be collected from a number of small farms and delivered to a common processing unit.

TABLE 1.1 International Trade by Commodity Groups, 1972

(percentages)

	Composition of world exports	Composition of exports from industrial areas	Composition of exports from developing areas	Share of developing areas in total world exports
Primary Products				
Food	14.3	11.8	22.9	28.8
Raw Materials	5.6	4.1	8.6	27.7
Ores and Minerals	2.5	1.7	4.5	32.0
Fuel	10.4	3.4	38.6	66.9
Total Primary Products	32.8	21.0	74.5	40.9
Manufactures				
Non-ferrous Metals	2.8	2.4	3.5	22.7
Iron and Steel	4.8	5.7	0.9	3.4
Chemicals	7.1	8.8	1.9	4.9
Engineering Products	24.6	29.6	4.1	3.0
Road Motor Vehicles	7.7	10.3	0.1	0.3
Textiles and Clothing	6.4	6.4	7.2	20.2
Other Manufactures	11.9	13.9	6.2	9.3
Total Manufactures	65.3	77.2	23.9	6.6
TOTAL EXPORTS	100.0	100.0	100.0	18.0

Notes:

(1) All figures from GATT (1974, Table G).

(2) Australasia and South Africa are included in world totals, but not elsewhere.

SOURCE: J.T. Thoburn, Primary Commodity Exports and Economic Development, p.4.

TABLE 1.2 Dependence of Developing Countries on Export of Primary Commodities 1970-72 Average

Commodity	Dependence as percentage of total merchandise export earnings				
	More than 66%	50 to 66%	33 to 49%	20 to 32%	10 to 20%
Bananas		Panama	Ecuador Guadeloupe Honduras Martinique	Costa Rica Cape Verde Tonga	
Bauxite				Jamaica Surinam Somalia	Guyana Haiti
Beef			Uruguay		Argentina Nicaragua Paraguay Chad
Cocoa	Equatorial Guinea Sao Tome/Principe	Ghana	Togo	Cameroon	Benin Ivory Coast Nigeria
Coffee	Burundi Rwanda	Colombia Ethiopia	El Salvador Guatemala Haiti Ivory Coast Yemen Arab Republic	Brazil Costa Rica Angola Cameroon Central African Republic Equatorial Guinea Kenya Malagasy	Ecuador Honduras Nicaragua Guinea Tanzania Togo Papua New Guinea
Copper	Chile Zaire Zambia	Namibia		Peru	Philippines
Copra	Seychelles Tonga		Comoros		
Cotton		Chad Sudan	Egypt Upper Volta Syria	Nicaragua Central African Republic Mali Uganda Yemen Arab Republic	Philippines El Salvador Guatemala Benin Mozambique Swaziland Afghanistan
Fishmeal				Peru	
Groundnuts Groundnut oil	Gambia		Niger		Mali
Iron ore	Liberia Mauritania			Swaziland	Sierra Leone
Jute			Bangladesh		
Lead				Namibia	
Maize					Argentina Thailand
Manganese ore				Gabon	
Phosphate rock	Spanish Sahara		Togo		Morocco Jordan
Rice	Nepal	Kampuchea	Burma		Thailand
Rubber				Malaysia	Liberia Indonesia Kampuchea Sri Lanka
Sugar	Cuba Mauritius	Dominican Republic Guadeloupe Fiji	Barbados	Belize Guyana	Jamaica Mozambique Philippines
Tea		Sri Lanka			Kenya Malawi Bangladesh
Tobacco			Malawi		
Timber non-conifer	Laos	Congo		Gabon Ivory Coast Burma Philippines	Paraguay Indonesia Malaysia
Tin		Bolivia			Rwanda Malaysia
Wheat					Lesotho
Wool				Uruguay	Lesotho
Zinc					Niger

Note: The percentage dependence is approximate for the reason that the coverage excludes a number of commodities significant in the exports of some countries. For example, the exclusion of diamonds overstates Namibia's dependence on copper: the exclusion of cloves and cashewnuts distorts the dependence percentages of Tanzania. The definition of dependence as a proportion of total merchandise exports also conceals some distortions. Re-exports from coastal countries to landlocked countries tend to reduce the dependence of coastal countries. This is particularly true in cases where some coastal countries with refineries import crude and re-export petroleum products to neighbouring countries.

SOURCE: IBRD EC/166.
L.N. Rangarajan, Commodity Conflict.

TABLE 1.3 Main Categories of Food Processing

Commodity group	Extraction of edible component	Conversion to more edible form	Conversion to new products	Preservation	Meeting consumer demand
Less Perishable Crops	Sugar milling; oilseed crushing	Milling of grains and pulses; treatment of starchy roots; tea and coffee processing	Bakery, confectionery and pasta making; manufacture of fermented soy products; brewing, distilling		More refined milling, juice extraction, prepared foods and mixes convenience packaging
Perishable Crops			Wine making; jam making	Drying, smoking, canning, freezing, etc. of fruit, vegetables, milk, meat, fish	
Livestock Products	Slaughtering, flaying and cutting		Butter and cheese making		
Fish					

TABLE 1.4 Main Processes Undergone By Non-food Agricultural Products

Commodity group	Main processes
Apparel fibres	Cotton ginning, wool scouring, silk reeling; spinning, weaving, production of piece goods, clothing
Nonapparel fibres	Retting and decortication of jute and hard fibres; production of sacking, hessian, cordage, matting, carpets
Rubber	Coagulation, milling, smoking, vulcanization, etc.; manufacture of tyres and other rubber products
Hides and skins	Curing, tanning; production of shoes and other leather goods
Technical and essential oils	Oil extraction; manufacture of soap,. paint, etc.
Tobacco	Curing, fermentation; manufacture of tobacco products
Fish	Production of fishmeal, fish oil, glue, etc.
Forest products	Sawmilling; manufacture of veneer and plywood, fibreboard and particle board; production of pulp, paper and paperboard; manufacture of construction materials, containers, furniture, etc.

SOURCE: FAO, "Agriculture and Industrialization", reprinted from The State of Food and Agriculture 1966.

TABLE 1.5 Export Market for Raw Materials and Processed Forms for Selected Commodities 1970 and 1973

(Value - million US$)

	Export market in 1970			Export market in 1973		
	Total market	Developing countries		Total market	Developing countries	
		Value	Share %		Value	Share %
1. Sugar, raw and refined						
Raw sugar	1913	1726	90.2	3327	2843	85.5
Refined sugar	374	120	32.1	921	196	21.3
2. Green coffee and soluble coffee						
Green coffee	3082	2993	100.0	4332	4111	100.0
Soluble coffee	123	23	18.7	271	109	40.1
3. Cocoa beans, cocoa products and chocolate						
Cocoa beans	862	853	100.0	945	931	100.0
Cocoa powder, paste, butter	279	129	46.2	424	206	48.5
Chocolate	277	0	0.0	478	0	0.0
4. Tobacco, unmanufactured and manufactured						
Unmanufactured tobacco	1147	409	36.0	1667	681	41.0
Tobacco manufactures	654	83	13.0	1976	217	11.0
5. Oilseeds, vegetable oils and processed oils						
Oil seeds	2796	1303	46.5	5428	3397	37.5
Vegetable oils	1389	686	49.4	2452	1239	50.5
Processed oils, margarine	274	35	12.7	498	58	11.6
6. Hides and skins, leather and footwear						
Hides and skins, leather	1408	364	26.0	2836	648	22.8
Footwear	1641	159	9.7	2770	411	14.8
7. Natural and synthetic rubber and rubber tyres						
Natural rubber	1127	1127	100.0	1910	1910	100.0
Synthetic rubber	573	0	0.0	885	0	0.0
All rubber	1700	1127	66.3	2795	1910	68.3
Rubber tyres	1981	neg	0.0	2095	neg	0.0
8. Wood, veneers and plywood, wood manufactures						
Wood, rough and shaped	3589	1127	31.4	7716	2363	30.6
Veneers and plyboard (631)	947	248	26.0	2139	646	30.0
Wood manufactures (632)	432	29	7.0	916	115	12.5
631 and 632	1379	277	20.0	3055	761	20.8
9. Raw cotton, cotton yarn, cotton fabrics and clothing						
Raw cotton	2111	1660	79.0	3493	2425	69.5
Cotton yarn	331	182	54.9	822	561	68.2
Cotton fabrics woven	1436	474	33.0	2766	997	36.0
Clothing	5106	1136	22.0	9821	2989	30.5
10. Copper, and copper wirebars, tubes and pipes						
Copper ores and metal	4111	2887	70.2	5157	3749	72.6
Copper wirebars, tubes, pipes	775	0	0.0	729	0	0.0
11. Bauxite, aluminium and aluminium products						
Bauxite	230	206	89.6	213	168	78.9
Aluminium	2160	116	5.4	3044	159	5.2
Aluminium plate, sheet, strips	412	0	0.0	660	0	0.0

Note: Re-exports ignored.

SOURCE: L.N. Rangarajan, Commodity Conflict : UN Yearbook of International Trade Statistics, GATT.

TABLE 1.6 Exports of Selected Commodities in Processed and Unprocessed Form, 1970

	SITC No.	Shares of Developed	Shares of Developing	Proportions for Developed	Proportions for Developing
1. MEAT					
Fresh and frozen meat	011	80.4	19.6	82.2	76.8
Meat preparations	013	74.6	25.4	17.8	32.2
2. FISH					
Fresh and frozen fish	031	73.5	26.5	70.7	84.6
Fish preparations	032	86.3	13.7	29.3	15.4
3. FRUIT					
Fresh fruit	051	57.5	42.5	69.8	83.3
Preserved fruit	053	74.5	25.5	30.2	16.7
4. VEGETABLES					
Fresh vegetables	054	70.7	29.3	68.9	84.6
Preserved vegetables	055	85.8	14.2	31.1	15.4
5. COCOA					
Cocoa beans	072.1	0.9	99.1	1.9	88.1
Cocoa powder	072.2	79.8	20.2	33.6	11.3
Chocolate	073	97.9	2.1	64.5	0.6
6. LEATHER					
Hides and skins	211	70.8	29.2	47.3	51.0
Leather	611	70.5	29.5	42.4	46.4
Leather manufactures	612	91.2	8.8	10.3	2.6
7. GROUND NUTS					
Groundnuts	222.1	19.6	80.4	63.0	58.7
Groundnut oil	421.4	17.0	83.0	37.0	41.3
8. COPRA					
Copra	221.2	0.0	100.0	0.4	50.2
Coconut oil	422.3	10.9	89.1	99.6	49.8
9. PALM KERNEL					
Palm kernel	221.3	0.1	99.9	0.4	64.6
Palm kernel oil	422.4	26.9	73.1	99.6	35.4
10. RUBBER					
Natural rubber	231	29.0	71.0	67.2	99.4
Rubber products	621	97.2	2.8	32.8	0.6
11. WOOD					
Wood in the rough	242	45.3	54.7	27.2	71.8
Wood, shaped	243	84.9	15.1	72.8	28.2
12. PULP AND PAPER					
Pulpwood	251	98.1	1.9	32.7	36.6
Paper and paperboard	641	99.0	1.0	57.2	35.6
Articles of paper	642	95.6	4.4	10.1	27.8
13. TOBACCO					
Tobacco unmanufactured	121	69.8	30.2	56.4	79.4
Tobacco manufactured	122	87.3	12.7	43.6	20.6
14. COTTON					
Cotton	263	23.5	76.5	34.1	77.3
Cotton fabrics, woven	652	67.0	33.0	65.9	22.7
15. JUTE					
Jute	264	4.0	96.0	14.6	37.9
Jute fabrics, woven	6534	13.0	87.0	85.4	62.1
16. WHEAT					
Wheat unmilled	041	95.0	5.0	88.6	83.7
Wheat, meal or flour	046	72.6	7.4	11.4	16.3
17. IRON					
Iron ore	281	53.9	46.1	20.2	79.1
Pig-iron	671	87.0	13.0	11.7	8.0
Iron steel, primary forms	672	96.8	3.2	22.2	3.4
Iron steel, shapes	673	95.7	4.3	45.9	9.5
18. COPPER					
Copper ores	28311	30.4	69.6	7.0	8.4
Copper unrefined	68211	14.0	86.0	4.7	15.3
Copper refined	68212	37.9	62.1	88.3	76.3
19. PETROLEUM					
Crude petroleum	331	5.3	94.7	17.5	78.3
Petroleum products	332	48.9	51.1	82.5	21.7
20. ALUMINIUM					
Bauxite	2833	8.2	91.8	2.8	85.0
Aluminium unwrought	6841	94.6	5.4	97.2	15.0
21. ZINC					
Zinc ores, concentrates	2835	75.8	24.2	44.9	51.7
Zinc alloys, unwrought	6861	80.5	19.5	55.1	48.3

SOURCE: B. Ohlin ed., The International Allocation of Economic Activity.

TABLE 1.7 Capital and Labour Input Relationships in Mineral Processing Industries

	Direct and indirect requirements per million dollars of final output		
	Capital, mill. dollars	Labour, man-years	Capital/Labour ratio
Mining			
Iron ore	3.2	212	0.015
Copper	3.2	198	0.016
Lead and Zinc	2.6	230	0.011
Bauxite	2.7	221	0.012
Metal mineral processing			
Steel works and rolling mills	2.8	180	0.016
Copper and lead smelting and refining	2.4	121	0.020
Zinc smelting and refining	2.4	166	0.014
Aluminium smelting and refining	3.3	144	0.023
Metal fabricating			
Iron and steel forgings	2.0	180	0.011
Copper rolling and drawing	2.4	155	0.015
Aluminium rolling and drawing	2.2	178	0.012
Structural metal products	1.7	184	0.099
Fabricated wire products	2.0	165	0.012
Tubes and foils	2.0	207	0.010
Fabricated pipe	1.7	176	0.010

SOURCE: M. Radetzki, "Where should Developing Countries' minerals be processed?", World Development 1977 'Reprint Series' 76 - I.I.E.S.

TABLE 1.8 Distribution of the Total Company Labour Force by Category, Selected Banana Divisions, Average 1974 - 1976 [a]

- No. of persons -

Category	Bananera (Guatemala)	Armuelles (Panama)	Bocas del Toro (Panama)	Average	
				No. of persons	Percentage Distribution
1. Farms	1,926	2,397	2,047	2,123	48.9
2. Boxing Stations	1,004	875	1,089	989	22.8
3. Transportation	115	98	141	118	2.7
4. Wharf	244	277	366	296	6.8
5. Eng. & Maint. [b]	424	468	575	489	11.3
6. Services [c]	158	92	170	140	3.2
7. Management	198	192	164	185	4.3
TOTAL	4,069	4,399	4,552	4,340	100.0

a One month in each year; Guatemala 1973 - 1975.

b Engineering, construction, electric plant and maintenance.

c Security, parks, sanitation and medical services.

SOURCE: Banana Development Company of Guatemala - BANDEGUA (Del Monte)
Chiriqui Land Company (United Brands).
Data obtained in field visits to banana divisions - December 17th 1975 (Bananera), February 8th - 12th 1977 (Armuelles and Bocas del Toro).

Frank Ellis, "The role of labour in the technology of banana production", Mimeo. IDS, June 1978.

TABLE 1.9 The Estimated Nutritional Importance of Processed Food Intake [1]

	CALORIES		PROTEINS	
	Fresh	Processed	Fresh	Processed
	Percent		Percent	
Cereals	12.0	40.5	9.1	38.3
Wheat and wheat flour	2.0	16.7	2.2	18.2
Rice	7.0	12.4	4.0	9.0
Maize	2.0	4.2	1.9	3.6
Other cereals	1.0	7.2	1.0	7.5
Fruits, vegetables and oilseeds	14.7	2.8	17.6	3.0
Roots and tubers	7.1	0.8	3.8	0.5
Pulses, nuts and oilseeds	4.1	1.0	9.5	2.5
Vegetables	1.5	-	3.4	-
Fruits	2.0	-	0.9	-
Sugar and sugar products	1.0	7.9	-	0.2
Foods of animal origin	1.9	11.8	5.5	26.1
Meat	-	7.2	-	14.1
Eggs	0.7	0.1	1.8	0.3
Fish	0.2	0.6	1.5	3.1
Milk and dairy products (excl. butter)	1.0	3.9	2.2	8.6
Fats and oils (incl. butter)	1.0	7.4	-	0.2
Vegetable oils	-	5.3	-	-
Animal fats (incl. butter)	1.0	2.1	-	0.2
TOTAL	30.6	69.4	32.2	67.8

1 Processed foods in this table are broadly defined, i.e. they include fresh, chilled and frozen meat, grains milled in plants, sugar made in factories and pulses processed in commercial enterprises.

SOURCE: FAO Working Paper "Patterns and Trends of Trade in Processed Foods, Feedstuffs and Beverages during the 1960s".

TABLE 1.10 Mexico: Capital Intensities and Productivities for Firms by Size in Three Food Subsectors, 1970

Subsectors	Size (L) (Number of employees)	FK/L	TK/L	O/L	Highest to lowest FK/L	Highest to lowest TK/L
		(000 pesos, 1960)			(Ratios)	
Fruits and vegetables	1-25	88.2	140.0	34.6	11.3	7.0
	26-100	33.6	73.5	32.1		
	101-350	25.8	69.5	34.6		
	351-500	22.5	45.7	17.2		
	501-750	28.1	80.9	34.2		
	over 750	7.8	20.1	9.9		
Biscuits and pasta	1-25	31.1	39.6	21.8	1.6	1.6
	26-75	50.8	67.9	25.4		
	76-175	43.9	66.9	38.7		
	176-250	42.5	66.8	50.3		
	251-500	38.6	46.1	31.4		
	over 500	45.9	51.9	40.5		
Vegetable oils and fats	1-15	72.1	101.3	40.3	1.8	3.1
	16-100	111.8	190.9	79.4		
	101-175	93.5	328.2	123.8		
	176-350	87.1	186.6	91.5		
	351-500	77.3	188.1	85.8		
	over 500	59.3	100.4	30.7		

Note: L = Labour.
FK = Fixed capital.
TK = Total capital (fixed and working capital).
O = Value added.
W = Wages.

SOURCE: K. Unger, Research Student, IDS.

TABLE 1.11 Mexico: Capital Intensities and Productivities in Food Manufactures, Three Subsectors in Food Manufactures and Total Manufactures, 1960 and 1970 (000 pesos, 1960)

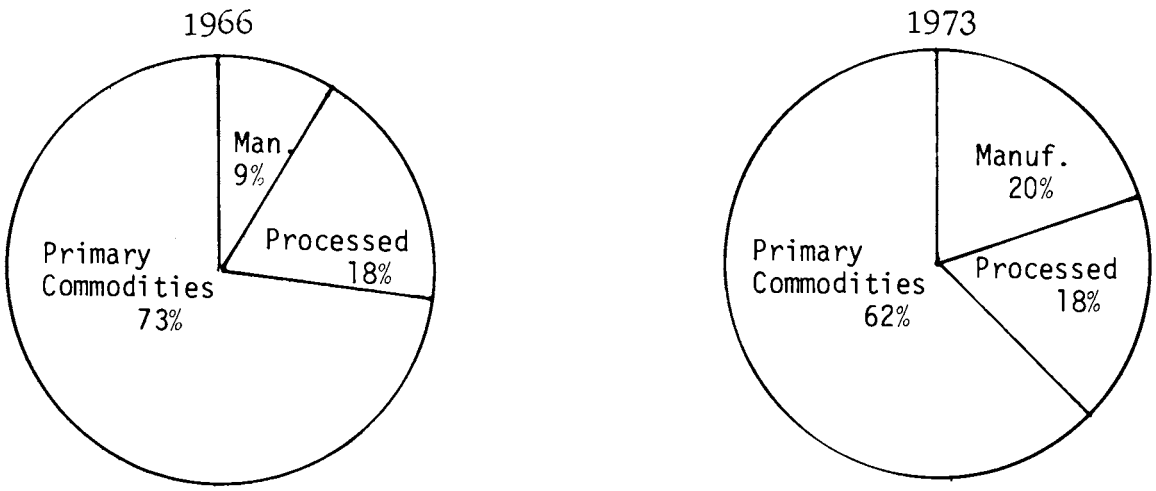
Subsectors		FK/L	O/L	TK/L	O/TK	W/O
Food manufactures	1960	15.6	14.6	45.5	0.30	0.45
	1970	41.2	31.7	62.0	0.51	0.34
Fruits and vegetables	1960	15.7	19.4	57.6	0.33	0.50
	1970	20.8	23.7	51.9	0.45	0.41
Biscuits and pasta	1960	22.2	15.8	51.9	0.30	0.63
	1970	43.8	36.6	53.5	0.68	0.50
Vegetable oils and fats	1960	45.7	19.2	184.7	0.10	0.68
	1970	86.4	82.0	194.8	0.42	0.22
Total manufactures	1960	25.7	15.8	51.4	0.30	0.59
	1970	53.7	41.1	78.4	0.52	0.40

Note: L = Labour.
FK = Fixed capital.
TK = Total capital (fixed and working capital).
O = Value added.
W = Wages.

SOURCE: K. Unger, Research Student, IDS.

FIGURE 1

Composition of LDC exports to DMEC's



Total value = $16.3 b

Total value = $32.9 b

Share of developing country exports in DMEC imports - by value & %

	1966		1973	
Primary Commodities	- 50%	(11.8 b $)	43%	(20.3 b $)
Processed "	- 21%	(3.0 b $)	17%	(5.8 b $)
Manufactures	- 13%	(1.5 b $)	19%	(6.7 b $)
Total	- 33%	(16.3 b $)	28%	(32.9 b $)

SOURCE: UNCTAD 'An Integrated Programme for Commodities' TD/B/C.1/166/Supp.5.

NB. Data based on a selected group of primary commodities and products processed from them.

Footnotes

1. Hans Singer and Javed Ansari, Rich and Poor Countries, p.17.

2. United Nations, General Assembly, Resolutions.

3. UNIDO, Lima Declaration and Plan of Action on Industrial Development and Co-operation, p.5 para.28.

4. H.W. Singer, 'Reflections on the Lima (25%) Target', pp.2-4.

5. Ibid., p.8.

6. UNCTAD, An integrated programme for commodities: trade measures to expand processing of primary commodities in developing countries (TD/B/C.1/166/Supp.5).

7. FAO, The Role of International Agro-Industry in a New International Economic Order, p.3.

   For other examples of 'international'statements see also: Action Programme adopted by the Ministerial Conference of Developing Countries on Raw Materials, Dakar Feb. '75; OECD Resolutions in Bulletin of the European Communities No.5 1975.

8. See Table 1.1.

9. See Fig. 1.

10. See Table 1.2.

11. M. Roemer, Resource-based Industrialisation in the Developing Countries, p. (i).

12. UNDP, Development Issue Paper 6, p.1.

13. FAO, Agriculture and Industrialisation, p.5.

14. See Tables 1.3 and 1.4.

15. World Bank, Staff Working Paper No. 225.

16. UN, Classification by Broad Economic Categories, p. (viii) para. 13.

17. See Appendix I: List of selected 'processed' raw materials.

18. See Tables 1.5 and 1.6.

19. L.N. Rangarajan, Commodity Conflict, p.147.

20. Ibid.

21. FAO, The Patterns and Trends of Trade in Processed Foods, Feedstuffs and Beverages during the 1960s, p.9.

22. United Nations Centre on Transnational Corporations, Transnational Corporations and the Processing of Raw Materials, Footnote 4:

> "According to one rough estimate final consumers pay over US$200 billion excluding taxes, for the major primary exports (consumed in a more processed form) of developing countries (excluding oil exports), while the latter receive just [our italics] US$30 billion. (Source: M. Ul Haq The Third World and the I.E.O.' Turkeyen Lectures 1975). A more specfic estimate is presented by Girvan for bauxite. Four to five tons of bauxite worth between US$40 to US$80 will yield one ton of primary aluminium metal worth US$700-800, which in turn will yield semi-fabricated products worth between US$1000-1500. (Source: N. Girvan, Corporate Imperialism: Conflict and Expropriation. White Plains, New York: M.E. Sharpe, 1976 p.101)."

23. G. Sarkar, 'Tea: Some Policy Issues', p.22.

24. N. Girvan, Multinational Corporations and Dependent Underdevelopment in Mineral-Export Economies; and J.T. Thoburn, Primary Commodity Exports and Economic Development, p.39.

25. FAO, Agriculture and Industrialisation, pp.13-14; and UNIDO, Draft World-Wide Study on Agro-Industries: 1975-2000, pp.20-21.

26. A.O. Hirschman, The Strategy of Economic Development.

27. Girvan, Multinational Corporations, p.514.

28. L. Kaounides, Research Proposal, pp.13-16.

29. Thoburn, Primary Commodity Exports; especially Ch.5.

30. Girvan, Multinational Corporations, pp.521-522.

31. FAO, Agriculture and Industrialisation, p.10.

32. Thoburn, Primary Commodity Exports, Ch.6 for Rubber and Palm Oil linkages, and also Ch.7.

33. UNIDO, Possibilities for the further processing of sugar industry by-products.

34. OECD, Tropical Fruit Processing Industry.

35. M. Radetzki, "Where should Developing Countries' Minerals be processed?", p.333 and Footnote 3; and also see Table 1.7.

36. Frank Ellis, "The role of labour in the technology of banana production", mimeo. IDS, June 1978; see also Table 1.8.

37. OECD, Processed Agricultural Products and Agricultural Adjustment, p.11.

38. A.O. Hirschman, "A Generalized Linkage Approach to Development", pp. 77-80.

39. Ibid., p.78.

40. FAO, Agriculture and Industrialisation, p.8.

41. Development and Environment, Founex Report, UNCTAD Secretariat contribution, p.197.

42. OECD, Processed Agricultural Products and Agricultural Adjustment, p.5.

43. FAO, The Patterns and Trends of Trade in Processed Foods, p.12; see also Table 1.9.

44. See Tables 1.10 and 1.11.

45. Singer, "Reflections on Lima Target", p.18.

46. UNIDO, Basic Issues, Macro Policies and Components of a Programme of Development, Chs. II and III.

47. Ibid., p.5 Footnote 6.

SECTION II

Trends in the Expansion of Processing of Local Raw Materials in Developing Countries

Despite a certain 'restructuring of exports' from LDCs in favour of processed and resource-based manufactured products, and the increase in absolute terms of both the volume and value of their exports to DCs over the period 1966 to 1973, the relative share of developing countries in the world export markets nonetheless remains small and is actually declining for a number of processed raw materials. This is particularly the case for many processed foodstuffs, including beverages and tobacco.

As we saw in Section I, in 1974, for eleven major commodity groups, LDCs accounted for 61.2% of the raw material exports (in 1973 it was 62.5%) but only 20.8% of the processed products market. If we look at Table 1.5 and 1.6, the same regression, from raw to processed forms, is evident for all the product groups.

The developing countries are major producers and suppliers of many of the non-renewable natural resources; in 1975, as a group, they accounted for 52% of copper exports, 71% of bauxite exports, 84% of petroleum and approximately 40% of international trade in both nickel and iron ore exports. These five minerals alone accounted for more than 80% of the world value of mineral production.(1) Not only are LDCs important suppliers now in many natural resource groups but are likely to become increasingly more so, as supplies in DCs become depleted and new deposits continue to be discovered in developing countries. LDCs' importance in trade is further emphasised by the small proportion of their minerals production actually consumed domestically.

However, over the past two decades the proportion of all the minerals extracted in LDCs which are processed there, has remained fairly constant at only 30%.(2)

Trade in processed agricultural products accounts for approximately 20% of the value of world agricultural exports.(3) Although the developing countries' exports of agricultural raw materials in processed forms increased over the period 1960-69 by 60% - representing an annual growth rate of 5.4% - the exports of developed market economies rose by 75% (that is, 6.4% per annum) and those from the centrally planned economies by a rapid 155% (11% per annum). (4) Hence the relative share of LDCs in world export markets of processed agricultural products actually declined from about 20% in 1960 to 18.5% in 1970. This fall may be attributed mainly to the decline in vegetable oil exports from the Near East and Africa, the sharp fall in North African wine exports and slow increase in oilseed cakes and canned fish exports.

This shift in the balance of trade in processed commodities is also seen when we concentrate on trade only between LDCs and the OECD countries.(5) From 1966 to 1970 LDC exports of processed agricultural products increased by about 25%, whilst LDC imports, of the same product groups, from OECD rose by 60%. In the field of metals (ores, semi-processed and processed, combined) developing countries increased their exports to the OECD states by 32%, whilst over the same period (1966-1972) their imports of these products (see Table 2.5) rose by 80%. If we disaggregate the figures we can see that of the total OECD metal exports to LDCs, 82% were in semi-processed or processed forms, but only 7% of the LDC metal exports had undergone processing.

The share of developing countries in processed agricultural commodity exports remains small, despite the fact that world trade in processed foodstuffs is rapidly expanding. In an FAO study (6) of processed foods, over half the products had doubled their world export value during the First Development Decade; and these accounted for more than 40% total value of global processed food trade. Certainly the demand for processed agricultural products, particularly many foodstuffs, is more 'buoyant' than for the unprocessed forms. This can be explained by a number of factors: demand for processed foods is highly income elastic, so rising incomes and increased urbanisation have had significant effects. To the extent that the nutritional value of food is no longer of vital importance, especially in the DCs, the taste, presentation and various sophistications assume greater weight; exotic and dietetic foods, and soft drinks for example, are all increasingly in demand.

Convenience and 'time-saving' food preparations are becoming more and more attractive; also the growth in institutional eating places has raised the demand for processed catering products. Growing demand for animal proteins means an increasing need for animal feedstuffs, making the utilisation of various by-products a more viable and profitable proposition. All these are growth areas where LDCs have potential to enter the market on a competitive basis, and in Section IV, ways in which production might be stimulated will be suggested.

Nonetheless, despite the overall decline in the trade share of LDCs in processed agricultural commodities, there are a number of product groups where their market share has in fact increased. Indeed the developing countries have what may be defined as a 'strong trading position', that is to say they account for over 40% of world trade, in the meat and fish meal, coffee extracts, processed cocoa products (but not chocolate) and oilseed cakes and meal markets. In the latter group, however, the LDC market share declined during the sixties but their share of cocoa paste, powder and butter, soluble coffee and preserved vegetables trade has increased substantially. Other important processed food groups for LDCs, where they account for between 25-40% of world trade, are the cereal milling by-products, oils and fats, and preserved fruit. For the latter group the market share is increasing

A feature of global processed food trade is the importance of particular commodity groups: four processed product groups account for 60% of international trade in processed foodstuffs. The largest group are livestock products which, in 1970, had a market share of over 20%. The exports from

the developing countries are even more highly concentrated; the combined 'oilseeds, oils and fats' sector accounted for over 50% of the value of their exports. Conversely, the processed food trade of the OECD countries is in general well diversified, with no one product group accounting for more than 25% of their exports to LDCs.

It is also noteworthy, that nearly all the commodities entering the processed food trade, apart from some obvious exceptions like tropical foodstuffs, are produced in both developed and developing countries. Furthermore, for some of the fastest growing product groups (7) like confectionery, dairy products and convenience foods, which account for nearly 30% of the total processed food market, the developed market economies arguably hold "... inherent or traditional production advantages"; (8) indeed it is striking that LDCs account for less than 2% of international trade in these products.

The developed countries thus play a central role in processed foodstuffs and for a selected group of 'fast growing products' their trade over the 1960-69 period increased by over 70%. Furthermore, over 70% of total world trade in processed food is between the DCs while in contrast only about 10% of LDCs processed foodstuffs exports go to other developing countries; half of this is accounted for by Asia and a further 35% by Latin American countries.(9) As we suggest in Section IV, there is certainly considerable potential for developing such trade among developing countries by forming or strengthening regional trade groups. Aggregation, however, obscures important differences both between developing countries and between commodity groups.(10) The degree of specialisation varies from country to country, as does also the importance of particular food products in LDC export earnings.

The 'oils and fats' group (11) is the largest processed food sector in the exports of developing countries and (as already mentioned) accounted in 1970 for over 25% of the value of LDC exports to the OECD countries; but the rate of expansion in recent years has been only marginal (approximately 0.1% per annum) and the LDC share of exports to DCs fell from nearly 60% in 1965 to 53% in 1970. Over 85% of this commodity group is accounted for by vegetable oils. The major suppliers are Senegal and Nigeria and over two-thirds of vegetable oil exports are accounted for by five countries.

Another important related group are the 'oilseed cakes and meals'(12) but again the LDC market share, though substantial, is declining (e.g. from nearly half the market in 1965 to a 40% share in 1970). Latin American countries account for half these exports, with Argentina and Brazil as the two major suppliers.

A major product group are the processed fruits (13) where LDCs account for over 25% of OECD imports of this commodity; throughout the sixties OECD imports from LDCs grew at an annual rate of 8.5%, well above the average rate of 5.4% for all processed foodstuffs during that period. There are two main categories within this product group: dried fruit and secondly, preserved fruit and preparations, including canned fruit, jam and fruit juice. Although production and trade in canned fruit is dominated by the DCs, nonetheless the LDC share in world output increased from about 6% in 1960 to 10% in 1970, and exports increased over the period by 150%. A similar expansion is seen for fruit juices, where over the last decade both output and exports increased

substantially. Tropical fruit processing industries are currently at a very low level of development although certain unprocessed tropical fruit play a substantial role in international trade. The world import value of citrus fruit, as also that of bananas, is over US $1 billion. There is thus considerable potential for LDCs to develop the tropical fruit processing industries, as they often are the major - if not the sole - suppliers. A recent study (14) concludes that there are significant export possibilities for processed tropical fruits. An area of high potential, where trade at present is limited, is the 'exotic fruit' market, expecially in mangoes, guavas, papayas and passion fruit. A major processed tropical fruit are canned pineapples, where 75% of the total world production of 4.0 million tons are processed; they rank as high as the most popular canned deciduous fruits, e.g. pears, peaches, etc., where the DCs are the major suppliers.

If we now turn to the non-agricultural processing industries we find that despite efforts by developing countries to expand the degree of domestic processing, on average only 30% of the minerals extracted in LDCs do in fact get locally processed. Table 2.1 (15) illustrates the present situation. The typical pattern is one of LDCs exporting the majority of their minerals in unprocessed form while other regions, where often only a small amount of minerals is actually extracted, undertake the bulk of the processing. We see that the proportion of output processed locally in LDCs has remained almost stable, whereas in Western Europe it has increased fivefold.

However, there are considerable differences in the proportion of output that is domestically processed by LDCs for the various individual minerals, as the following table illustrates:

Minerals processed in LDCs
as a % of total minerals mined in LDCs

	1960	1970
Bauxite	3	10
Copper	75	78
Iron Ore	23	25
Lead	57	69
Tin	66	79
Zinc	29	42

Source: M. Radetzki, "Where should Developing Countries' minerals be processed?"

Copper is a particularly good illustrative example of the role which developing countries currently play in the processing of domestic raw materials. Even though the bulk of LDCs' copper production is processed domestically, at least to the metal ingot stage, we see that whilst LDCs and DCs accounted in 1975 for approximately the same share, 39%, of the world's copper production, the developed countries accounted for 47% of total world smelting capacity and LDCs only 31%; at the next processing stage of 'refining' DCs have a 55% share and LDCs 19.7%. Finally the developing countries consume only 6.3% of the world's copper, whilst the DCs consume 67.0%. (16) It is

also worth noting that while LDCs account for 39% of world copper output, they account for 52% of the raw copper market because a much smaller percentage is consumed domestically than in the DCs.

However, there are wide variations among the individual copper producing countries; the four biggest copper producers (Zambia, Zaire, Chile and Peru) smelted 92% of their copper ore, but while Zambia processed 94% of this to the next stage, Peru undertook further processing for only 20% of its smelted copper. (17)

The degree of processing of non-renewable resources that is undertaken locally in developing countries is partly determined by technological characteristics. Transport costs may be a major determining factor. The later stages of iron ore processing are very closely linked; consequently most processing industries are located in the developed countries, near the main markets.

However, the other essential, and sometimes all-important factor, is the role played by foreign investment. This, in fact, to a large extent determines the extent and trends in the amount of processing that is undertaken locally in LDCs. For example, over half the world's production of bauxite is owned and controlled by six transnational corporations. (18) They furthermore (in 1971) accounted for more than 75% of global aluminium production capacity and approximately 60% of primary aluminium production. These six transnational corporations get over half their supply of bauxite from developing countries but locate only some 30% of their alumina processing facilities there, and less than 10% of the bauxite produced in LDCs is actually processed to aluminium in LDCs by the transnational corporations.

Nickel is one of the minerals least processed in developing countries, even though the developing countries' capacity for smelting and refining nickel has been growing rapidly in recent years. (19)

In summary, we see that for a representative sample of processed foodstuffs and processed non-renewable natural resources, LDCs account on average for only 20% of international trade in these products despite the fact that as much as 60% of raw material exports originate from these countries.

The same pattern is repeated for trade in unprocessed and processed non-food agricultural products, like leather, pulp and paper, wood, jute, cotton and rubber industries. In all these commodities, LDCs account for less than one-third of international trade in a processed form. Jute is the only exception, where, in 1970, the LDCs had a 96% share in the world export market for raw jute, and accounted for 87% of the woven, jute fabrics exports. Nearly all these commodities face the additional problem of strong competition from the synthetics and "... an extra dimension is added to existing conflicts." (20) The added constraint this may place on LDCs domestically processing their raw materials, which must compete not only with natural forms processed in the DCs but also with a whole range of synthetic products, raises very important and interesting questions: but unfortunately it is not possible to consider them within the time constraint of this study. This certainly is an important area for further research. Thus throughout this

study it must be borne in mind that for a number of processed raw materials LDCs face constraints not only in the form of the obstacles presented by foreign investors, developed country trade policies, inadequate and fluctuating supplies, lack of credit and infrastructure facilities etc., but also competition from synthetic products.

We shall now turn, in Section III, to these constraints facing developing countries in their attempts to expand the degree of processing of their primary commodities, both for the domestic and world markets. As stated earlier, we are concentrating on the obstacles that relate specifically to processing industries, for to consider all the constraints on industrialisation *per se* is well beyond the scope of this survey.

TABLE 2.1 Minerals Processed as a Percentage of Total Minerals Mined Different Regions, 9 Major Minerals Combined, 1950, 1960 and 1970

Region	Percentage of mine production		
	1950	1960	1970
United States and Canada	146	179	179
Western Europe	250	381	1,046
Australia and South Africa	89	72	38
Developing market economies	30	28	29
Centrally planned economies	99	102	108
Total	100	100	100

1 Computed as the value produced by mining and processing operations as a percentage of total value produced, had all ore mined been processed to metal ingot stage, except for iron ore, manganese ore and phosphate rock for which pelletized or sinterized iron ore, ferromanganese, and superphosphate fertilizer were taken as representing the processed product.

SOURCE: UNCTC, Transnational Corporations and the Processing of Raw Materials, Feb. 1978.

TABLE 2.2a Participation of Developing Countries in Activities of Selected Mineral Industries

(Share of developing countries as percentage of total)

	Iron and Steel		Copper		Aluminium	
	Market Economies Only	World as a Whole	Market Economies Only	World as a Whole	Market Economies Only	World as a Whole
Reserves	41	23	60	53	-	62
Mining	34	30	46	37	59	52
Smelting	5	4	40	32	30[1]	27[1]
Refining	10	8	23	19	7	7
Markets	9	6	5	3	6	5

1 Alumina production.

SOURCE: As Table 2.1.

TABLE 2.2b Structure of the Iron and Steel Trade of Developing Countries by Processing Stage, 1973

($ million)

Exports by source and destination \ Stage of processing	Ore and concentrates	Semi-manufactures	Finished manufactures	Total
From developing to developed	719	529	175	1,423
From developing to developing	20	246	60	326
From developed to developing	4	5,274	735	6,013
Net developing country exports	715	-4,745	-560	-4,590

SOURCE: UNCTC, Transnational Corporations and the Processing of Raw Materials, Feb. 1978.

TABLE 2.3 World Production Trends in Selected Processed Foods, Feedstuffs and Beverages, 1960 and 1965 to 1969

ISIC Division	SITC Division	Description	1960	1965	1966	1967	1968	1969	Changes 1960 to 1969 (Percent)
					Thousand metric tons				
3111.06	012	Meat and edible offals cured salted or smoked	3,875	3,807	3,760	4,053	4,264	4,086	+ 5
3111.07	013.8	Meat, canned (excl. extracts and sausages)	1,089	1,315	1,269	1,359	1,390	1,296	+ 19
3112.01	022.1	Milk, condensed and evaporated	3,766	4,192	4,303	4,312	4,381	4,557	+ 21
3112.02	022.2	Milk, dried	2,090	3,142	3,306	3,798	4,134	4,169	+ 99
3112.03	023	Butter and ghee (product weight)	4,946	5,549	5,493	5,614	5,714	5,580	+ 13
3112.04	024	Cheese (excl. curd and processed cheese)	4,706	5,852	6,237	6,448	6,546	6,817	+ 45
3114.03	032.0(1)	Fish, canned	1,266	1,457	1,558	1,569	1,620	1,688	+ 33
3116.03	046.0(1)	Wheat flour	98,690	105,832	109,641	109,222	111,040	111,094	+ 13
3116.02	047.0(1)	Cereal flours, other than wheat	4,836	5,090	5,338	5,215	4,975	5,615	+ 16
3116.04	046.0(2) and 047.0(2)	Cereal meals and groats	6,319	7,383	7,981	8,559	8,742	8,901	+ 41
3117.03	048.3	Macaroni and noodle products, uncooked	4,398	4,879	4,851	5,030	4,535	4,904	+ 12
3117.91	048.4(2)	Biscuits	2,200	2,808	2,834	2,922	2,988	3,060	+ 39
3113.01	052	Fruit, dried	958	1,530	1,656	1,600	1,775	1,860	+ 94
3113.06	053.3	Fruit jams, marmalades and jellies	1,161	1,370	1,316	1,310	1,328	1,368	+ 18
3113.03	053.9	Fruit, canned or bottled	3,433	4,195	4,466	4,305	4,841	5,063	+ 47
3113.94	053.5	Fruit and vegetable juices	3,116	4,250	4,410	5,195	6,000	6,360	+104
3113.07	054.6(1)	Vegetables, frozen	1,059	1,675	1,961	2,120	2,270	2,447	+131
3113.08	055.5(2)	Vegetables, canned or bottled	6,784	8,537	9,321	10,527	10,793	10,318	+ 52
3119.93	062.0(1), 073 and 053.2	Sugar preparations and chocolate products	3,777	4,739	4,181	4,956	5,186	5,429	+ 44
3119.02	072.2	Cocoa powder, unsweetened	111	129	134	134	138	139	+ 25
3115....	081.3 and 081.4(2)	Oilseed cakes and fish meal	35,500	44,796	46,859	47,800	49,800	51,100	+ 44
3122.01	081.9(9)	Animal feedstuffs prepared	27,393	48,906	52,513	57,854	61,214	67,331	+146
3111.10	091.3	Lard	4,900	4,700	4,700	4,900	4,800	4,900	-
3115.13	091.4	Margarine and lard imitations	5,307	6,147	6,406	6,612	6,759	6,944	+ 31
3134.91	111.0(1) and (2)	Mineral waters and soft drinks (1,000 hectolitres)	133,156	184,715	209,487	224,581	240,065	259,454	+ 95
3132.02	112.1(2)	Wine excl. grape must (1,000 hectolitres)	24,347	28,855	27,291	28,519	28,321	27,712	+ 14
3133.01	112.3	Beer (1,000 hectolitres)	403,579	502,032	523,330	546,126	560,098	590,905	+ 46
3131.01	112.4	Distilled alcoholic beverages (1,000 hectolitres)	25,272	31,515	33,137	33,933	35,307	36,977	+ 46
...	4	Vegetable and animal fats and oils (excl. waxes)	27,210	27,220	28,001	35,110	36,359	36,740	+ 35

SOURCE: FAO, The Patterns and Trends of Trade in Processed Foods (ESCR:Misc.73/1)

TABLE 2.4 Sources of OECD Imports of Processed Food Groups by Economic Classes - 1969

'000 US Dollars

SITC	Product	World	from OECD	from centrally planned countries	from Australia, New Zealand, South Africa and Israel	from developing countries
012	Meat	352.5	305.3	42.2	1.3	3.7
013	Canned meat	684.8	406.7	91.6	13.4	173.1
022.1	Milk	56.6	...	...	...	...
022.2	Milk	223.5	...	...	...	...
023	Butter	427.2	237.6	10.8	175.8	3.0
024	Cheese and curd	571.5	501.4	3.9	62.0	4.2
032	Canned fish	425.6	328.3	25.8	12.6	58.9
046	Meal and flour of wheat	23.7	22.4	-	0.8	0.5
047	Meal and flour of other cereals	16.8	...	...	...	...
048	Cereals	294.0	274.2	10.9	5.9	3.0
052	Dried fruit	166.6	123.0	4.7	20.6	18.3
053	Preserved fruit	724.1	359.8	41.2	141.8	181.3
055	Preserved vegetables	491.6	334.2	35.7	4.3	117.4
061	Sugar preparations	58.1	...	...	...	...
062	Sugar confectionery	110.0	105.6	1.6	0.7	2.1
071.3	Coffee extracts	109.8	...	...	...	...
072.2	Cocoa powder	31.5	...	...	...	...
072.3	Cocoa powder	224.4	...	...	...	...
073	Chocolate	209.5	200.5	2.8	3.0	3.2
081.2	Cereal bran	113.4	...	...	...	...
081.3	Oilseed cakes and meals	760.9	422.3	20.1	11.0	307.5
081.4	Meat meal	401.3	120.1	2.7	53.3	225.2
091.4	Margarine	13.8	...	...	...	...
099	Food preparations	198.0	175.7	1.6	3.8	16.9
112.1	Wine and must	633.7	506.4	6.8	7.5	113.0
112.2	Beer and cider	7.6	...	...	...	...
112.3	Beer	120.7	116.8	2.2	0.2	1.5
112.4	Distilled alcoholic beverages	767.1	727.9	3.0	1.5	34.7
223.9	Oilseed flour	2.7	...	...	...	...
411.1	Oil of fish	93.0	55.2	6.2	9.3	22.3
411.3	Animal oils	159.5	124.3	2.1	19.1	14.0
421	Vegetable oils, soft	393.5	187.6	79.1	3.6	123.2
422	" " other	388.4	80.5	6.4	7.8	293.7
431	Animal and vegetable oils, processed	135.6	115.7	1.4	0.4	18.1
	TOTAL	9,391.0	6,689.7	402.8	559.7	1.738.8

SOURCE: FAO, The Patterns and Trends of Trade in Processed Foods (ESCR:Misc. 73/1)

TABLE 2.5 Trade in Metals Between OECD and Developing Countries 1966 and 1972

Metals [a]	1966	1972	1966	1972
1. Exports from OECD [b] to developing countries (f.o.b.)	($ million)		(Per cent)	
- Crude ores and concentrates	74	121	3	2
- Iron, steel and nonferrous metals (unwrought)	581	902	18	16
- Semi-processed metals	1,870	3,645	60	65
- Processed metals	599	962	19	17
Total	3,124	5,630	100	100
2. Imports by OECD [b] from developing countries (c.i.f.)				
- Crude ores and concentrates	2,249	2,910	48	47
- Iron, steel and nonferrous metals (unwrought)	2,359	2,885	50	46
- Semi-processed metals	41	242	1	4
- Processed metals	39	173	1	3
Total	4,688	6,210	100	100

a Crude ores and concentrates: SITC 28;
Iron, steel and nonferrous metals: SITC 671 + 672 + 68;
Semi-processed metals: SITC 67 - (671 + 672) + 691 + 692 + 693;
Processed metals: SITC 69 - (691 + 692 + 693).

b Excluding Turkey.

SOURCE: UNCTAD TD/B/C.1/197, p.5.

TABLE 2.6 Fast Growing Processed Foods and Their Annual Export Growth Rate by Value in Developed, Developing and Centrally Planned Countries 1960-1969 [1]

SITC Heading	Item	World Total	Developed Countries	Developing Countries	Centrally Planned Countries
		(Percent Change)			
024	Cheese and curd	7.6	7.3	- 0.4	28.0
048	Cereal preparations	10.5	10.5	0.4	12.3
053	Processed fruit	8.7	7.6	10.4	21.5
055	Processed vegetables	11.3	10.4	12.3	19.2
061.9	Sugar preparations	9.9	9.9	9.8	9.8
062	Sugar confectionery	8.6	8.4	30.0	13.0
071.3	Coffee extracts	13.7	10.1	24.5	...
072.2-3	Cocoa powder, butter and paste	11.3	9.5	13.8	...
073	Chocolate and cocoa preparations	13.0	12.7	...	28.5
081. 2	Cereal milling by-products	8.2	14.4	5.7	- 17.0
081.3	Oilseed cake and meals	9.5	15.0	6.5	- 3.7
081.4	Meat and fish meal	9.8	8.7	10.4	20.5
081.9	Pet foods and other prepared feedstuffs	14.3	14.3	14.3	14.3
099	Food preparations, n.e.s.	18.2	18.2	19.7	10.3
112.2-4	Beer and distilled alcoholic beverages	9.3	9.6	4.8	4.0

1 Current values calculated in U.S. dollars.

SOURCE: FAO, The Patterns and Trends of Trade in Processed Foods (ESCR: Misc.73/1).

TABLE 2.7 Exports of Fats and Oils (SITC 4), Preserved Vegetables (SITC 055), Preserved Fruits (SITC 053) and Canned Meat (SITC 013) from Developing Countries to Developing Country Markets, by Regions, 1964 and 1969

	Africa	Latin America	Near East	Asia	Others	Total D.C.'s
All developing countries						
Value of exports (million dollars)						
1964	23	29	3	50	1	106
1969	12	47	14	62	1	136
Annual growth rate 1964-69 (percent)	- 12.2	10.2	36.0	0.8	-	5.1
Africa						
Value of exports (million dollars)						
1964	10	-	5	7	1	23
1969	5	-	6	1	-	12
Annual growth rate 1964-69 (percent)	- 13.0	-	3.8	- 32.4	...	- 12.2
Latin America						
Value of exports (million dollars)						
1964	-	24	-	5	-	29
1969	2	38	1	4	2	47
Annual growth rate 1964-69 (percent)	...	9.6	...	- 4.4	...	10.2
Near East						
Value of exports (million dollars)						
1964	-	-	3	-	-	3
1969	1	-	13	-	-	14
Annual growth rate 1964-69 (percent)	...	...	34.0	-	-	36.0
Asia						
Value of exports (million dollars)						
1964	3	1	11	35	-	50
1969	3	-	8	49	2	62
Annual growth rate 1964-69 (percent)	-	...	- 6.2	7.0	...	4.4

SOURCE: FAO, The Patterns and Trends of Trade in Processed Foods (ESCR:Misc. 73/1).

TABLE 2.8 Leading Developing Country Exporters of Selected Processed Foods to the OECD Countries, 1969.
(Million Dollars)

	Total of 8 Product Groups	Canned Meat	Preserved fruit	Preserved vegetables	Cocoa butter paste & powder (1)	Oilseed cakes & meals	Fish & meat meal	Wine	Animal & veg. oils
Argentina	253.2	117.5	1.8	-	-	70.2	7.8	-	55.9
Peru	178.4	-	-	-	-	-	178.4	-	-
Brazil	157.4	22.1	12.4	2.0	25.9	48.4	-	-	46.6
Philippines	105.5	-	24.6	-	-	15.4	-	-	65.5
Taiwan	99.5	-	24.7	78.8	-	-	-	-	-
Algeria	98.7	-	-	3.4	-	2.2	-	91.4	1.7
Nigeria	90.4	-	-	-	24.1	23.2	-	-	43.1
Senegal	56.9	-	-	-	-	18.1	-	-	38.8
Morocco	50.4	-	11.5	9.9	-	1.2	3.3	8.6	15.9
Mexico	44.2	-	28.9	3.2	6.1	6.0	-	-	-
Malaysia	41.8	-	8.2	-	-	-	-	-	33.6
Indonesia	41.6	-	-	-	-	13.8	-	-	27.8
Ivory Coast	40.5	-	9.8	-	-	29.3	-	-	1.4
Zaire (Congo DR)	36.3	-	-	-	-	4.0	-	-	32.3
India	26.0	-	-	1.3	-	24.7	-	-	-
Chile	22.1	-	-	-	-	-	22.1	-	-
Tunisia	21.2	-	1.6	1.3	-	-	-	6.9	11.4
Ghana	21.1	-	-	-	21.1	-	-	-	-
Singapore	20.6	-	8.5	-	-	-	-	-	12.1
Paraguay	17.7	12.6	-	-	-	2.7	-	-	2.4
Cameroon	17.2	-	-	-	15.9	-	-	-	1.3
Sudan	16.4	-	-	-	-	16.4	-	-	-
Angola	13.0	-	-	-	-	-	10.7	-	2.3
Kenya	11.9	5.1	2.1	-	-	4.7	-	-	-
Tanzania	11.5	6.1	-	-	-	5.7	-	-	-
Thailand	9.4	-	2.0	6.2	-	1.2	-	-	-
Total of above	1,502.9	163.4	136.1	102.1	122.4	257.6	222.3	106.9	392.1
Others	190.5	9.7	45.2	15.3	4.6	49.9	2.9	6.1	56.8
All developing countries	1,693.4	173.1	181.3	117.4	127.0	307.5	225.2	113.0	448.9

SOURCE: FAO, The Patterns and Trends of Trade in Processed Foods (ESCR:Misc.73/1).

(1) FAO estimate.

TABLE 2.9 Pattern of Export Earnings from Oilseeds, Oils and Fats by Developed and Developing Countries in 1970

(US$ million)

Product	Oilseeds					Oils					Cakes				
	Total world exports	Total OECD exports	OECD exports as a % of total world exports	Total dev'g country exports	Dev'g country exports as a % of total world exports	Total world exports	Total OECD exports	OECD exports as a % of total world exports	Total dev'g country exports	Dev'g country exports as a % of total world exports	Total world exports	Total OECD exports	OECD exports as a % of total world exports	Total dev'g country exports	Dev'g country exports as a % of total world exports
Soyabean	1301	1221	94%	31	2%	311	302	97%	8	3%	504	460	91%	44	9%
Cottonseed	32	3	9%	29	91%	65	46	71%	17	26%	77	2	3%	75	97%
Groundnut	322	47	15%	269	84%	146	19	13%	124	85%	126	5	4%	121	96%
Sunflower seed	70	20	29%	3	4%	195	30	15%	21	11%	35	10	29%	25	71%
Rapeseed	145	134	92%	3	2%	51	33	65%	1	2%	15	13	87%	2	13%
Linseed	71	68	96%	3	4%	57	20	35%	38	67%	49	10	20%	39	80%
Copra	203	0.1	0.05%	203	100%	234	20	9%	214	91%	30	3	10%	27	90%
Castor oil	14			10	71%	50	3	6%	45	90%					
Olive oil						184	145	79%	39	21%					
Palm-Palm kernel	80	0.1	0.13%	80	100%	244	23	9%	221	91%	19	7	37%	12	63%
Tung oil						16	1	6%	12	75%					
Sesame seed	46	0.2	0.43%	46	100%										
Oilseed, cake and meal (nes)											40	13	33%	27	68%
Meat meal and fish meal											531	167	31%	361	68%
Oils of fish and marine animals						130	70	54%	51	39%					
Animal oils, fats and greases except lard						324	297	92%	24	7%					
Total	2284	1493	65%	677	30%	2007	1009	50%	815	41%	1426	690	48%	733	51%

SOURCE: OECD, "Processed Agricultural Products and Agricultural Adjustment", July 1973.

TABLE 2.10 Production and Exports of Processed Fruit Products by Selected Developed and Developing Countries in 1970

	Dried Fruit	Canned Fruit	Fruit Juice	Frozen Fruit
	('000 m.t.)		(million hl)	('000 m.t.)
Production:				
Total world production	2,961.5	4,410.5	35.4	388.4
Total OECD production	984.9	3,403.6	31.6	332.4
Total OECD production as a % of total world production	33%	77%	89%	86%
Total developing country production	1,954.4	478.5	3.2	56.0
Total developing country production as a % of total world production	66%	11%	9%	14%
Exports:				
Total world exports	980.4	1,456.0	7.7	132.3
Total OECD exports	469.3	620.4	4.5	43.0
Total OECD exports as a % of total world exports	48%	43%	58%	32%
Total developing country exports	487.2	395.5	2.6	56.0
Total developing country exports as a % of total world exports	50%	27%	34%	42%

Note: The country coverage is not complete, but it is believed to be representative.

SOURCE: OECD, "Processed Agricultural Products and Agricultural Adjustment", July 1973.

TABLE 2.11 Distribution of Copper Extraction and Processing Capacity among Developed and Developing Market Economies and Centrally Planned Economies, 1975

	Developed market economies	Developing market economies	Centrally planned economies	World
EXTRACTING				
Thousands of metric tons	2817.0	2858.0	1622.0	7297.0
Percentage of total	38.6	39.2	22.2	100.0
SMELTING				
Thousands of metric tons	3421.0	2224.0	1630.0	7275.0
Percentage of total	47.0	30.6	22.4	100.0
REFINING				
Thousands of metric tons	4619.0	1646.0	2102.0	8367.0
Percentage of total	55.2	19.7	25.1	100.0
CONSUMPTION				
Thousands of metric tons	5020.0	471.0	2005.0	7494.0
Percentage of total	67.0	6.3	26.7	100.0

SOURCE: UNCTC, "Transnational Corporations and the Processing of Raw Materials", February 1978.

TABLE 2.12 Percentage Distribution of Company-owned Capacities in Six Major Bauxite-aluminium Corporations in 1975[1]

	Bauxite		Alumina		Primary Aluminium	
	DMEs[2]	LDCs[3]	DMEs	LDCs	DMEs	LDCs
Alcan	9	91	55	45	93	7
Alcoa	31	69	72	28	94	6
Alusuisse	73	37	85	15	100	0
Kaiser	40	60	89	11	83	17
Pechiney Ugine Kuhlmann	84	16	91	9	95	5
Reynolds	16	84	86	14	97	3

[1] Capacity refers to volume of production in plants owned by various companies.

[2] DME = Developed Market Economies.

[3] LDC = Developing countries.

SOURCE: as Table 2.13.

TABLE 2.13 Smelter and Refinery Production of Nickel, in 1000 Tons, Metal Content 1955-75, in Developed and Developing Market and Centrally Planned Economies

	1955		1975[1]	
	tonnage	share (%)	tonnage	share (%)
Developing countries	3.7	1.5	99.3	14.2
Developed market economy countries	190.8	79.6	428.0	61.2
Centrally planned economy countries[2]	45.1	18.8	172.6	24.7
World	239.6	100.0	699.9	100.0

[1] 1975 is not fully representative for the long-term trend as production fell in most developed market economies resulting in an unusually low share for these countries.

[2] Excluding Cuba.

SOURCE: UNCTC, "Transnational Corporations and the Processing of Raw Materials", February 1978.

Footnotes

1. UNCTC, Transnational Corporations and the Processing of Raw Materials, p.4.

2. See Table 2.1.

3. See Table 2.3 for global production trends in selected foodstuffs over the '60's.

4. FAO, The Patterns and Trends of Trade in Processed Foods, Feedstuffs and Beverages during the 1960's, p.18.

5. See Table 2.4 for OECD imports of processed foodstuffs and Table 2.5 for trade between OECD and LDCs in metals.

6. FAO, The Patterns and Trends of Trade in Processed Foods, Feedstuffs and Beverages during the 1960's, especially p.7.

7. See Table 2.6.

8. FAO, The Patterns and Trends of Trade in Processed Foods, Feedstuffs and Beverages during the 1960's, p.7.

9. See Table 2.7.

10. See Table 2.8.

11. See Table 2.9.

12. and again Table 2.9.

13. See Table 2.10.

14. OECD, Tropical Fruit Processing Industry, 1976.

15. See also Tables 2.2a and 2.2b

16. See Table 2.11.

17. Source: UNCTC, Transnational Corporations and the Processing of Raw Materials, especially p.9.

18. See Table 2.12.

19. See Table 2.13.

20. L.N. Rangarajan, Commodity Conflicts, p.182; and also pp. 180-89, where the following articles are referred to : Journal of World Trade Law Nos. 5, 6 and 7 for series of studies on the 'Challenge of synthetics' particularly to textiles, hides and skins, rubber, hard fibres (sisal, abaca etc.) and jute. And also E.R. Grilli, "The Future of Hard Fibres and Competition from Synthetics", IBRD Staff Occasional Papers No.19, 1975.

SECTION III

Constraints to the Expansion of Processing and their Importance e.g. Tariff Escalation, Technology, Scale, Existing Capacity in Developed Countries, Finance, Political Risks etc.

Developing countries face a number of constraints to an expansion of domestic raw material processing facilities, whether for export or local markets. A recent UNCTAD study (1) lists the major obstacles to downstream processing as follows: tariffs and non-tariff trade barriers, the restrictive practices of vertically integrated companies, difficulties in competing with established brands, shortage of capital, lack of technology and skilled manpower, high transport and energy costs, lack of proximity to consumer markets, inadequate infrastructure, lack of necessary complementary materials, unsuitable climate and so on. However, not all these obstacles are specific to processing industries, and indeed, inadequate infrastructure confronts LDCs in all spheres of development.

In all natural resource processing industries, by definition, the raw material is a major input and therefore it is essential that regular and uniform supplies be maintained, both in terms of quality and quantity. Indeed it is for this very reason that generally, whenever LDCs have been major, if not sole, suppliers of raw materials, foreign investors have tended to integrate 'upstream' to control all stages from production/extraction to distribution. This is the case with the majority of minerals and also many tropical agricultural products, wherever foreign investment plays a central role.

For other agricultural commodities, which are produced in both developed and developing countries, vertical integration is not much in evidence, nor has it generally been very successful. For these commodities, the main types of agricultural supply arrangements are purchases on the free market and various types of contractual agreements. The main problem here has been an irregular flow of agricultural supplies, which presents "... one of the main constraints to the development of the agricultural processing industries throughout the world."(2) The need for close integration between processing and production facilities is further reinforced by the biological nature of renewable natural resources. The supply of agricultural products varies according to weather, pests, disease etc., but is to some extent controllable by the use of insecticides, fertilizers and so on, and also by irrigation. Therefore it is in the interest of the processor to maintain close links with primary producers and to encourage all such measures which serve to ensure a more regular supply. The production of most crops is concentrated within certain seasons of the year and this can mean idle processing plant capacity out of season. This may be alleviated by processors encouraging farmers to produce a range of crops, or a given crop at different seasons, so as to ensure supplies ready for processing at different periods spread throughout

the year. Similarly, the perishable nature of much agricultural product creates a need for close contact between producers and processors, and also for some degree of advance planning. Green peas, for example, must be canned or frozen within only 3-4 hours of picking. Furthermore, integration between producers and processors affords opportunities for quality control, by choosing the seeds, fertilizers, weed controls etc.; specific requirements regarding shape, size, texture, colour, etc. can also be catered for.

Therefore, if the processing of these agricultural raw materials is undertaken domestically, many benefits may be gained, in particular a more regular supply of raw materials to the processing industries, by closer integration of primary producers and processors.

To the extent that vertical integration by foreign companies has taken place, this supply constraint is largely overcome. However, this very characteristic, that is to say the vertically integrated nature of foreign investment, presents other constraints to LDCs wishing to expand the processing of their natural resources. For on the one hand foreign corporations, despite possible cost advantages like lower transport costs, are in general reluctant to locate any processing industries in developing countries beyond what is absolutely necessary. This can be explained by a number of factors, apart from the general lack of infrastructure in LDCs: firstly, often additional inputs are needed at the processing stage which may be more readily available in DCs; secondly, access to different sources of raw material supplies means a greater regularity, and thus continuity of operation. Also, raw materials can be obtained from different sources in a 'least-cost' combination, for some commodities - especially, for example, vegetable oils - that are pretty much interchangeable. Proximity to retail markets allows for greater flexibility in choosing the type of processing, according to consumer demand. Long-established processing facilities are often located in DCs for strategic reasons, and once there, it is often more attractive to processors to expand existing facilities rather than instal entirely new plants (3). Finally, foreign investors want to reduce the risk of investment in LDCs as much as possible since "... the political order /in LDCs/ cannot be relied upon to regard their existence as sacrosanct."(4) Conversely political stability, and 'labour docility' may act as inducements for foreign investors, given the appropriate factor endowments, to locate production facilities in LDCs.(5)

Developing countries are therefore faced with a 'choice' of strategy concerning foreign investment, in processing their primary products (with or without integration with primary production itself). This 'choice' is determined by their relative bargaining strength, (6) which in turn depends on a multitude of factors. LDCs may either adopt some form of 'co-operation' strategy vis-a-vis foreign investors, and provide various incentives for foreign corporations to invest in local processing facilities; or take full control, in other words, nationalise. But in the latter case, the vertically integrated companies present two major obstacles:(7) (i) the control of marketing and distribution outlets, and (ii) the access to effective technologies. The latter obstacle is relevant to industries processing for both local and export markets.

These obstacles are created by a variety of restrictive business practices (8) which pose formidable barriers to developing countries expanding downstream into raw material processing. Such restrictive practices include firstly cartel practices which involve restrictions on pricing, market territories, quantity controls and on the customers who may be supplied. These commonly take the form of 'import cartels', 'rebate cartels', 'national export cartels' and other international cartels which allocate and control markets. All these are likely to have significant adverse effects on the expansion of local processing in LDCs. In recent years such practices have been increasingly tolerated by "... Governments which do not wish to contravene in an outright manner their obligations under the General Agreement on Tariffs and Trade."(9) Secondly, there are the restrictive business practices of multinational corporations in particular, which include territorial market and production allocation arrangements, and various pricing policies. These restrictions take a number of forms and are mainly implicit "... since written agreements to this effect are neither usual nor necessary between parent companies and foreign subsidiaries."(10) They include the following: restrictions on the LDC subsidiaries to export processed raw materials to firms outside the corporation; market allocation arrangements involving exports or the level of processing production by subsidiaries; transfer pricing within transnational corporations to encourage and preserve the allocation of production such that LDC subsidiaries are prevented from further processing of raw materials.

Thirdly, lexcessive advertising expenditures', which are counted for all fiscal purposes as 'normal marketing costs', present very real barriers to LDCs entering export markets, or domestic markets where brand names are well established. Such product differentiation creates particular obstacles in the confectionery, soft drinks and soluble coffee markets.

The other major obstacle that foreign companies may present to LDCs' expansion of local processing, concerns the acquisition of technology. While most of the basic technology for raw material processing is widely available on the open market,(11) the essential operational expertise, in particular, is not: "The lack of management experience, knowledge of linkages of operations and the team-based know how built up over time is more of a constraint on the ability of LDCs to process their raw materials than is the lack of theoretical knowledge."(12) An UNCTAD report (13) on the technological constraints imposed by multinational corporations identifies at least 40 restrictive practices which directly or indirectly may affect the expansion of further processing in LDCs, both for export and domestic markets. In particular these include general restrictions on volume, range of production and field of activity the purchaser of technology may pursue; limitations regarding sources of raw material, spare parts, intermediate inputs and capital goods; tying imports of necessary inputs to a specific external source and overpricing them; abusing the 'use of privilege' granted under the trademark system, for example prohibiting any <u>type</u> of processed products using the technology supplied or restricting exports to certain markets; specifying higher prices for exports than on output for domestic sale, and finally restrictions upon the recipient on adapting the technology to local conditions. All these are likely to have significant adverse effects on the expansion of raw material processing domestically, both for domestic and export markets.

There are, lastly, a set of major obstacles that confront LDCs expanding processing for export markets: trade barriers in the form of tariffs and non-tariffs (NTBs). For the reduced share of LDCs in world trade is not due simply to structural domestic factors, nor indeed solely because of the above constraints imposed by foreign corporations, but also because of trade policies actively pursued by the DCs. Traditionally many such policies were pursued for 'balance of payment' or Government revenue reasons, but increasingly the motivation is protectionist: to protect the agricultural sector and especially ailing domestic industries (both employers and workers), for a variety of historical, social and political reasons. The Common Agricultural Policy of the EEC is an obvious example, whereby farm incomes are maintained by a system of price supports (rather than income deficiency payments) and associated restrictions on entry of competing products from abroad, which discriminate particularly against processed tropical goods.

Tariffs present a major obstacle to LDCs expanding processing for export and those encountered by LDCs on their exports are on average 50% higher than those on DC exports.(14) This is largely because during the various rounds of multilateral tariff negotiations, the DCs have dominated proceedings. Thus, while substantial tariff cuts have been made on a reciprocal basis, for chemicals, machinery and generally, advanced technology capital-intensive products (which represent the major proportion of DC exports), only small cuts have been achieved on products of export interest to LDCs. Furthermore,"... the escalation of tariffs from raw materials and unprocessed goods to finished products imported by the developed nations discriminates against their exports of processed goods."(1 For tariff rates tend to increase with the degree of processing that a commodity undergoes. So while many raw materials enter duty free, processed goods encounter progressively higher rates. As a result, the rate of 'effective protection' (which is calculated" ... on the value added of an industry rather than on the full price of the protected output of the industry"(16) is even higher, and several times the nominal rate. Another characteristic of DC tariff schedules which may have a similar discriminatory effect, is the practice of charging specific rather than 'ad valorem' duties on certain classes of imports,(17) This overall pattern of tariff schedule discrimination means that"... tariff protection in the nations thus affects the location of production, with developing countries having a smaller share of processing activities than they would have had in the absence of tariff escalation."(18)

These difficulties are furthermore compounded by the incidence of NTBs which are" ... usually more restrictive than tariffs and sometimes far less easy to identify."(19) UNCTAD(20) lists 20 different such barriers, some of which are deliberate policy restrictions while others are indirect. The former type includes various quantitative restrictions, for example quotas, licensing agreements, embargoes, state trading arrangements, and also restrictions affecting the price directly: levies, supplementary import charges, preshipment deposits, anti-dumping duties etc. The latter 'indirect' type of NTB relates to various marketing, packaging, labelling and so-called 'voluntary' agreements, and especially to safety and health regulation.(21) The tendency is also for NTBs to increase both with the degree of processing and absolutely in number for much of LDC exports.(22)

A final trade obstacle that confronts LDCs expanding downstream processing and locating such facilities domestically, arises in the form of freight rate discrimination. The rates charged vary according to the value or the stage of processing of the products to be transported: both conference and non-conference shipping rates are lower for raw materials than processed goods. However, the variation is not in proportion to the value added and "freight rate escalation often has adverse effects on the local processing of raw materials in developing countries similar to those resulting from tariff escalation."(23) While the escalation of freight rates is sometimes justified by the special transportation requirements of processed commodities, often it is rather the result of monopolistic liner conferences exploiting the weak bargaining position of exporting LDCs.

Thus LDCs are confronted by many real constraints and obstacles to expanding the processing of their raw materials locally. The need to deal with these constraints is all too evident and "the removal of these obstacles requires decisive co-operative action at the national and international level, both between developed and developing countries and among developing countries themselves."(24)

TABLE 3.1 Frequency[a] of Import Restrictions Applied on Selected Products[b] of Export Interest to Developing Countries by Countries Maintaining Restrictions

Countries	BTN 1-24				BTN 25-99				Total BTN 1-99	No. of products affected
	Primary commodities	Semi-processed	Processed	Total BTN 1-24	Primary commodities	Semi-manufactures	Manu-factures	Total BTN 25-99		
France	6.7	9.0	12.5	9.0	-	5.3	16.7	6.3	8.3	38
Fed. Rep. of Germany	3.9	6.9	10.8	6.7	-	6.8	-	6.8	7.3	31
Ireland	6.7	6.9	10.0	7.7	-	3.0	-	3.0	6.5	34
United Kingdom	5.6	6.9	11.7	7.7	-	2.3	-	2.3	6.3	31
Denmark	5.6	6.9	10.6	7.4	-	1.5	-	1.5	5.8	29
Italy	5.6	7.6	7.5	6.8	-	1.5	-	1.5	5.4	31
Benelux	5.0	6.9	7.5	6.3	-	2.3	-	2.3	5.3	30
Austria	10.0	9.0	7.5	9.0	-	-	-	-	6.8	23
Norway	8.9	6.3	2.5	6.3	-	-	-	-	4.8	21
Switzerland	7.8	4.9	5.8	6.3	-	-	-	-	4.8	16
Japan	3.3	4.2	5.0	4.1	-	-	-	-	3.1	18
United States	1.7	1.4	2.5	1.8	-	2.3	-	2.3	1.9	10
Finland	-	1.4	5.0	1.8	-	-	-	-	1.4	6
Canada	1.1	2.1	-	1.1	-	3.0	-	3.0	1.5	9
Sweden	-	4.9	4.2	2.7	-	-	-	-	1.0	5
Australia	1.1	-	0.8	0.7	-	-	-	-	0.5	3
Simple Average	4.6	5.3	6.5	5.3	-	1.8	1.0	1.8		

SOURCE: TD/B/C.1/166/Supp.5 page 14; UNCTAD secretariat calculations.

[a] Frequency is defined in a footnote to table 3.2. The denominator (the number of possible restrictions) is: (number of products per stage of processing product group) x (12 types of restriction).

[b] A total of 49 products or product groups comprising 15 primary commodities: 23 processed and semi-processed agricultural products and semi-manufactures; and 11 manufactured products according to the UNCTAD classification.

TABLE 3.2 Frequency of Restrictions Applied to Groups of Products Within BTN Chapters 1-24 and 25-29 [a]

Product group	Incidence of restrictions								Distribution of restrictions for BTN 1-99
	Primary commodities/ Raw-materials		Semi proces/ manuf. prod.		Proces./ manuf. products		Total		
	%	No.	%	No.	%	No.	%	No.	%
I. BTN chapters 1-24									
Meat and meat products	9.9	19	11.5	22	12.8	49	11.7	90	21.7
Wheat and wheat products	7.0	27	6.8	26	4.9	19	6.3	72	17.3
Barley and barley products	6.8	26	5.7	22	-	-	6.3	48	11.6
Corn and corn products	6.3	24	5.5	21	-	-	5.9	45	10.8
Rice and rice products	5.5	21	5.2	20	-	-	5.3	41	9.9
Oranges and tangerines and products	0.5	1	-	-	4.7	27	3.6	28	6.8
Sugar and sugar products	2.1	8	-	-	6.8	13	3.6	21	5.1
Cocoa and cocoa products	-	-	-	-	6.8	13	6.8	13	3.1
Tobacco and tobacco products	1.0	2	-	-	3.6	7	2.3	9	2.2
Oleaginous products	1.0	2	0.7	4	-	-	0.8	6	1.4
Bananas and banana products	1.6	3	-	-	-	-	1.6	3	0.7
Total I	4.6	133	5.0	115	6.7	128	5.3	376	90.6
II. BTN chapters 25-99									
Jute and jute manufactures	-	-	4.7	18	1.0	2	3.5	20	4.8
Cotton products	-	-	0.5	3	-	-	0.5	3	0.7
Wool products	-	-	2.9	11	-	-	2.9	11	2.7
Phosphates and fertilizers	-	-	0.5	2	-	-	0.5	2	0.5
Pig iron, cast iron, etc.	-	-	1.0	2	-	-	1.0	2	0.5
Zinc products	-	-	0.5	1	-	-	0.5	1	0.2
Total II	-	-	1.8	37	1.0	2	1.7	39	9.4
Total number of restrictions for categories I and II	4.6	133	3.4	152	6.2	130	4.2	415	100.0

SOURCE: TD/B/C.1/166/Supp.5 page 13; UNCTAD secretariat calculations.

a Frequency for a product group is defined as the number of restrictions in a group as a percentage of the total number possible within the group. This measure is almost identical to the one described in UNCTAD document TD/B/C.2/R.1. The difference is that if a product group consists of more than one product (4-digit BTN category), the total count is also divided by the number of products in the group. This ensures that the measure is independent of the number of products in the group. In this table, the denominator (the number of possible restrictions of products) is: (number of products per stage of processing group) x (12 types of restrictions) x (16 countries).

TABLE 3.3 Comparison of Nominal and Effective Rates of Protection for Agricultural Products in the European Economic Community, Japan, and the United States, 1971

(Percentages)

Product	European Economic Community			Japan		United States	
	Tariff Rate		Effective protection [a]	Nominal protection	Effective protection [b]	Nominal protection	Effective protection [b]
	Nominal	Effective					
Meat products	19.5	36.6	165.0	17.9	69.1	5.9	10.3
Preserved sea foods	21.5	52.6	52.6	13.6	34.7	6.0	15.6
Preserved fruit and vegetables	20.5	44.9	74.7	18.5	49.3	14.8	36.8
Grain and grain products							
Corn milling	12.0	21.8	82.1	25.6	68.7	4.3	0.0
Rice milling	16.0	70.3	105.9	15.0	49.0	36.2	327.6
Prepared foods	5.6	0.0	- 50.0	0.7	- 21.2	6.2	7.4
Flour and cereal preparations	20.1	48.9	94.7	23.8	75.4	10.9	34.8
Bakery products	12.0	0.9	0.0	20.9	17.3	1.9	0.0
Tobacco products	87.1	148.5	148.5	339.5	405.6	68.0	113.2
Prepared and processed food							
Pickles and dressings	20.1	25.9	25.9	21.9	59.8	9.4	- 26.9
Roasted coffee	15.2	35.7	35.7	35.0	137.1	0.0	0.0
Cocoa powder and butter	13.6	76.0	76.0	15.0	125.0	2.6	22.0
Misc. food products	12.0	6.7	6.7	28.6	58.2	2.7	0.2
Leather and products							
Leather	7.0	21.4	21.4	17.8	57.4	6.2	18.6
Footwear	9.4	12.0	12.0	22.4	32.5	10.5	15.4
Jute products							
Jute fabrics	21.1	57.8	57.8	20.0	54.8	3.0	7.4
Jute sacks and bags	15.3	9.8	9.8	34.3	75.2	4.1	11.6
Sisal and Henequen products							
Binder-bale twine	13.0	26.0	26.0	10.5	21.0	0.0	0.0
Sisal ropes and cables	13.0	26.0	26.0	10.5	21.0	13.2	26.4
Yarns, thread and fabrics							
Wool yarn and thread	5.4	16.0	16.0	5.0	13.3	30.7	62.2
Wool fabrics	14.0	32.9	32.9	14.7	35.1	46.9	90.8
Cotton yarn and thread	7.0	22.8	22.8	8.4	25.8	8.3	12.0
Cotton fabrics	13.6	29.7	29.7	7.2	4.9	15.6	30.7
Cotton clothing	14.0	17.6	17.6	14.7	27.3	20.0	33.6
Vegetable oils							
Coconut oil	11.5	132.9	132.9	9.0	49.2	9.4	16.3
Cottonseed oil	11.0	79.0	79.0	25.8	200.3	59.6	465.9
Groundnut oil	11.3	139.7	139.7	14.2	96.5	15.0	6.7
Soyabean oil	11.0	148.1	148.1	25.4	268.3	22.5	252.9
Rapeseed oil	9.0	57.2	57.2	15.1	22.3	20.8	60.9
Palm kernel oil	10.5	141.5	141.5	7.2	49.2	3.8	29.2
Lumber and paper products							
Plywood products	..	..	..	..	..	13.0	28.0
Paper and paper articles	..	..	..	..	..	5.0	13.0

SOURCE: TD/B/C.1/197. Annex page 2.

Computations by the UNCTAD secretariat based on information from national and GATT sources.

a Includes levies and other special charges.

b Effective tariff protection.

TABLE 3.4 Nominal and Effective Protection for Mineral and Metal Products in the United States

(Percentages)

Product	Nominal protection	Effective protection
Pig-iron	1	6
Steel ingots	6	51
Metal manufactures	8	13
Non-metallic mineral products	6	10
Glass and glass products	13	20
Non-ferrous metals	6	14

SOURCE: UNCTAD TD/B/C.1/197 Annex.
UNCTAD secretariat calculations based on national statistics.

TABLE 3.5 Major Categories of Specific Non-tariff Barriers by Number[a] and Percentage[b] Incidence

Categories of non-tariff barriers	BTN 1-24								BTN 25-99								BTN 1-99	
	Primary commodities		Semi-processed		Processed		Sub-total		Primary commodities	Semi-manufactures		Manufactures		Sub-total			Total	Percentage
	No.	%	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	
Discretionary licensing	21	15.8	20	17.4	18	14.1	59	15.7	-	5	13.5	1	50.0	6	15.4		65	15.7
Quotas	20	15.0	5	4.3	11	8.6	36	9.6	-	9	24.3	1	50.0	10	25.6		46	11.1
Global import quotas	16	12.0	2	1.7	7	5.5	25	6.6	-	7	18.9	-	-	7	17.9		32	7.7
Bilateral import quotas.	-	-	1	0.9	4	3.1	5	1.3	-	2	5.4	1	50.0	3	7.7		8	1.9
Quotas, method unspecified.	4	3.0	2	1.7	-	-	6	1.6	-	-	-	-	-	-	-		6	1.4
Other restrictions																		
Minimum price	2	1.5	-	-	1	0.8	3	0.8	-	-	-	-	-	-	-		3	0.7
Variable levies [c]	63	47.4	67	58.3	75	58.6	205	54.5	-	-	-	-	-	-	-		205	49.4
Liberal licensing	4	3.0	-	-	-	-	4	1.1	-	2	5.4	-	-	2	5.1		6	1.4
Export restraints	-	-	-	-	-	-	-	-	-	20	54.1	-	-	20	51.3		20	4.8
Prohibitions	2	1.5	-	-	-	-	2	0.5	-	1	2.7	-	-	1	2.6		3	0.7
Restrictions, method unspec.	4	3.0	4	3.5	2	1.6	10	2.7	-	-	-	-	-	-	-		10	2.4
Health and sanitary regulations	-	-	5	4.3	18	14.1	23	6.1	-	-	-	-	-	-	-		23	5.5
State trading	17	12.8	14	12.2	3	2.3	34	9.0	-	-	-	-	-	-	-		34	8.2
Total	133	100.0	115	100.0	128	100.0	376	100.0	-	37	100.0	2	100.0	39	100.0		415	100.0

SOURCE: TD/B/C.1/166/Supp.5 page 15. UNCTAD secretariat calculations.

a The countries considered are Australia, Austria, Benelux, Canada, Denmark, Federal Republic of Germany, Finland, France, Ireland, Italy, Japan, Norway, Sweden, Switzerland, United Kingdom, United States.

b As percentage of the total non-tariff barriers for type of products.

c EEC counted as seven countries (Benelux, Denmark, Federal Republic of Germany, France, Ireland, Italy, United Kingdom).

TABLE 3.6 Summary of Non-Tariff Barriers Applied by Developed Countries On Imports of Selected Processed Commodities of Export Interest to Developing Countries

BTN Code	Description	Non-tariff barriers imposed by		
		EEC [a]	Japan	USA
03.02	Fish, salted in brine, dried or smoked	-	DL	HS
7.04	Dried, dehydrated or evaporated vegetables	A	-	-
8.11	Fruit, provisionally preserved	R/DL	DL	-
11.01	Cereal flours	VL	DL	GQ/BQ
11.02	Cereal groats and meal	VL	DL	GQ/BQ
11.06	Flour and meal of sago, and of manioc etc.	VL	-	-
11.08	Starches and inulin	VL	DL	-
15.10	Fatty acids, acid oils from refining, fatty alcohols	R/DL	-	-
16.01	Sausages	VL/DL/HS	-	-
16.02	Other prepared or preserved meat	VL/DL/HS	DL	-
16.03	Meat extracts and meat juices	HS/BQ	-	-
16.04	Prepared or preserved fish	BQ	-	-
17.04	Sugar confectionery	VL/R	-	GQ/BQ
18.06	Chocolate and other food preparations containing cocoa	VL/HS	-	BQ
20.01	Vegetables and fruits, prepared or preserved by vinegar or acetic acids	L/BQ/GQ/HS	HS	-
20.02	Other preserved vegetables	DL/L/BQ/GQ/HS	-	-
20.03	Fruit preserved by freezing, containing added sugar	VL/DL/L/GQ	-	-
20.05	Jams, fruit jellies, marmalades, fruit purée and fruit pastes	VL/DL/BQ/HS	DL	-
20.06	Fruit otherwise prepared or preserved	VL/DL/BQ/GQ/HS	DL	-
20.07	Fruit juices and vegetable juices	VL/L/DL/BQ/GQ/HS	DL	-
22.05	Wine	MP	-	-
22.07	Spirits, liqueurs and other spirituous beverages	R/DL/ST/GQ	-	-
24.02	Cigars and cigarillos	R/ST/DL/BQ/GQ	-	-
41.02	Calf leather	-	DL	-
41.03	Sheep and lamb skin leather	-	DL	-
41.04	Goat and kid skin leather	-	DL	-
53.07	Worsted yarn	DL/GQ	-	XR
53.11	Woven fabrics of sheep's or lambs' wool	DL/GQ	-	XR
55.05	Cotton yarn	AITT [b]	AITT [b]	AITT [b]
55.09	Cotton fabrics	AITT [b]	AITT [b]	AITT [b]
57.06	Jute yarn	GQ/XR	-	-
57.10	Woven fabrics of jute	XR/BQ/GQ	-	-
58.02	Other carpets and carpeting (not of cotton)	DL/BQ/Q	-	XR
60.02	Gloves, mittens, etc. (not of cotton)	Q	-	XR
60.04	Undergarments, knitted or crocheted (not of cotton)	BQ/Q	-	XR
60.05	Outergarments, knitted or crocheted (not of cotton)	LL/DL/BQ/Q	-	XR
61.01	Men's and boys' outergarments (not of cotton)	DL/BQ/Q	-	XR
61.02	Women's, girls', and infants' outergarments (not of cotton)	LL/DL/BQ/Q	-	XR
61.03	Men's and boys' undergarments (not of cotton)	DL/BQ/Q	-	XR
64.02	Footwear with outer soles of leather	-	DL	-
69.11	Tableware of porcelain	DL/BQ/GQ/Q	-	-
73.01	Pig iron	DL/BQ	-	-
73.02	Ferro-alloys	DL	-	-

SOURCE: UNCTAD, "Inventory of non-tariff barriers, including quantitative restrictions, applied in developed market economy countries to products of particular export interest to developing countries" (TD/B/C.2/115/Rev.1).

[a] Restrictions imposed in whole, or in part, by EEC member countries.

[b] Trade limited in accordance with the GATT Arrangement regarding International Trade in Textiles of 1974.

Symbols:
DL - Discretionary licensing
LL - Liberal or automatic licensing
L - Licensing of an unspecified character
GQ - Global quotas
BQ - Bilateral quotas
Q - Quota (method unspecified)
XR - Export restraint
VL - Variable levies
MP - Minimum import price
HS - Health and sanitary regulations
R - Restriction unspecified
ST - State trading

Footnotes

1. UNCTAD, An Integrated Programme for Commodities: Measures to expand processing of primary commodities in developing countries (TD/B/C.1/197).
See also UNCTAD TD/B/C.1/166 Supp. 5.

2. OECD, Processed Agricultural Products and Agricultural Adjustment, July 1973, p.12 para.16.

3. See M. Radetzki, "Where Should Developing Countries' Minerals be processed? The country view versus the multinational company view", World Development No.4 1977, especially pp.329-39.

4. N. Girvan, Multinational Corporations and Dependent Underdevelopment in Mineral-Export Economies, p.515.

5. D. Nayyar, "Transnational Corporations and Manufacturing Exports from Poor Countries", Economic Journal March 1978.

6. On bargaining models of MNC-host country relations in non-renewable resources see C. Fortin, "The State, MNCs and Natural Resources in Latin America", IDS Bulletin Vol.9 No.1, July 1977.

7. It is suggested that control of these two factors may in some cases give as much control "as does 100% equity ownership". UNCTC, Transnational Corporations and the Processing of Raw Materials, February 1978.

8. This section draws heavily upon UNCTAD TD/B/C.1/197, An Integrated Programme for Commodities.

9. Ibid. Annex p.7 para.15.

10. Ibid. Annex p.8 footnote 4/.

11. Ibid. See especially pp.16-18.

12. Ibid. p.18.

13. Ibid.

14. See Tables 3.1 and 3.2.

15. B. Balassa, "Effects of Commercial Policy on International Trade, the Location of Production, and Factor Movements", in B. Ohlin ed The International Allocation of Economic Activity, Nobel Foundation, 1977.

16. UNIDO, Industrial Development Survey, Special issue for Second General Conference, Lima 1975, p.79, and see Tables 3.3 and 3.4. See also UNCTAD (TD/B/C.2/36) on effective protection and its effect on processing industry.

17. For more complete explanation see UNCTAD TD/B/C.2/36.

18. B. Balassa, "Effects of Commercial Policy on International Trade", p.236.

19. UNDP, Global-1 Development Issue Paper 9 "Tariff and Non-Tariff Barriers to Trade", p.4.

20. UNCTAD TD/B/C.1/197, and UNCTAD TD/B/C.1/166 Supp.5.

21. See Appendix 2, Environment and Processing Industries, for further discussion.

22. See Tables 3.5 and 3.6.

23. UNCTAD TD/B/C.1/197. Annex p.10 para.20.

24. Ibid. p.6 para.12.

SECTION IV

Policy Requirements

Developing countries are confronted by many obstacles to establishing and expanding local processing facilities for indigenous natural resources, whether for the domestic market or for export. The term 'natural resources' covers a vast heterogeneous collection of commodities; therefore all policy proposals must necessarily apply more or less according to the type of commodity, which particular constraints it faces, in which country it is produced, as well as a host of determining factors like the political ability of governments, the social and economic situation and so on. But in all cases LDCs generally need to improve the necessary infrastructure, develop local markets (often largely rural) and develop co-operative measures by joint action, specifically in relation to expanding processing local raw materials.

In this section we therefore consider a number of general policy measures that could be taken both nationally and internationally to encourage LDC domestic processing, as well as more specific measures relating to the major constraints identified in Section III.

LDCs, in their own domestic policies, must pay especial attention to opportunities for expanded processing within their overall development strategy; full integration of policies in various fields is essential. The role of processing industries must be clearly defined in agricultural as well as industrial policies, and particularly its role in rural development strategies. It is essential to avoid contradictory or inconsistent policies where governments on the one hand encourage food processing industries but at the same time tax the imports of intermediate inputs, like tinplate used for canning.

Policies should be geared to utilise the stimulus that 'linkage effects' can create and the economies of backward and forward integration can be of great importance in the development process. Government measures can facilitate 'backward linkages', that is to say, production of intermediate inputs and increased raw material production, for example by providing road and land-clearing equipment, pipe and irrigation facilities, etc. Forward linkage may be induced by infrastructural investment in transport, electricity or, more specifically, improved storage facilities and marketing systems. Technological policy and R and D expenditures can also be usefully guided by the concepts of linkage, of which processing is an important part.

Where possible and appropriate, measures should be taken to encourage the development of indigenous small efficient processors;(1) incentives which permit firms to adapt their size and productive capacity to evolving local and international markets; measures which promote concentration, without loss of independence such as inter-firm co-operatives and co-ordinating centres like the "G.I.E." in France, (2) to undertake a variety of joint ventures. The 'leading enterprise', when appropriate, can be encouraged to provide

technical assistance to smaller enterprises. The development of sub-contracting relationships can be useful to smaller enterprises. Trade Associations between processing industries can be established.

A number of general monetary and fiscal measures are available to encourage local processors to enter production, including export incentives, general tax relief and where possible these should be integrated with other measures. Rural development policies for example can encourage rural co-operatives to set up special reserve funds for small and medium-sized processing industries. For larger-scale processing industries access to finance from state credit agencies should be facilitated.

Another important area of government policy is in research and in funding pilot plants to adapt technologies to local conditions and particularly to develop locally suitable processing equipment - preferably on a smaller scale, to help overcome any loss of competitive advantage arising from scale economies; to develop more suitable local varieties of raw materials; to promote the quality control and standardisation of primary products so essential to processing; and to undertake research into further uses for by-products and waste products. The dissemination and application of such research is of particular importance; this requires good links between the science and technology system and the production system. The poorer and smaller LDCs will find all this very difficult to achieve, and may require a good deal of financial and technical assistance.

In fact, in all measures designed to expand and support the domestic processing of LDC natural resources particular attention should be given to the problems of the least developed, small and land-locked countries. Such particular emphasis is justified by the proportionately even more important role which raw material processing industries can play in their initial industrialisation and development.(3)

Then there are specific policy measures that can be taken with regard to agricultural supply adaptation. Processing industries buying raw material supplies on the open market may be subject to a good deal of uncertainty, and policies should be aimed at encouraging dependable contractual supply arrangements between independent farmers and agricultural processing industries. Such arrangements themselves "... are in a sense a mechanism for self-regulating agricultural supply adjustment",(4) and provide for both regular supplies and uniform quality. The contract may cover various matters, such as stipulating prices, varieties, acreage, types of seeds, fertilizers, dates of planting, weeding and harvesting, harvesting methods and so forth, which leaves both sectors free to plan their activities within the agreed framework according to their own preferences. Often, in existing agreements, processing industries supply seeds and provide free technical assistance, perhaps also harvesting equipment etc. Producer Associations are helpful in establishing long-term contracts which may be encouraged by creating agencies to grant special incentives like 'take-off' and 'initial activity' aids.(5)

Where foreign investment is dominant, its very nature with its technical capabilities and its preference for vertical integration for the control of supplies and markets can serve to alleviate the problems of supply constraints, but as we saw in Section III, it may also in its turn present a number of other

constraints to the expansion of processing industries in developing countries. As is recognised in current discussions concerning a 'code of conduct', there is a clear need for both LDCs and DCs to co-operate and co-ordinate policies concerning the impact on developing countries of restrictive business practices of foreign enterprises, especially multinational corporations. LDCs could benefit by ensuring a free flow of information among them regarding the practices of foreign firms and by co-ordinating their foreign investment servicing procedures; in other words, it is "... essential that developing countries should harmonize their foreign investment legislation."(6) DC governments should likewise within their own legislation and control of restrictive business practices, take account of the need for similar monitoring and control on the part of LDCs. Furthermore, DC legislation, with specific impact on processing, should include control of national and international export cartels, discourage 'brand' monopolies by disallowing excessive brand advertising expenditures as an exemption from taxable profits. LDCs can also themselves legislate to prevent the proliferation of foreign brands and to encourage the development of local brands.

Foreign investment is particularly dominant in the field of non-renewable natural resources and in determining the location of processing facilities, but relationships are gradually changing in favour of processing in developing countries as technology becomes increasingly available on market terms and as the policies and leverage of the LDC resource countries become more clearly perceived and more purposefully used. As the assurance of raw material supplies, both in terms of quantity and of price stability, becomes increasingly important to processors, they are anxious to adopt a co-operative attitude to LDC host governments while at the same time diversifying and seeking alternative sources of supply. The choice of strategy that confronts LDCs vis-a-vis foreign investors is one determined by their relative bargaining strengths, which in turn depends on factors like alternative sources of supply of raw materials for foreign importers and processors, the size of domestic and export markets for the primary and processed forms, the dependence of LDCs on foreign exchange, the possibilities of regional LDC co-operation and so on.

In the latter instance, where LDCs decide that greater benefits may accrue by adopting a co-operative strategy in order to attract foreign investors in natural resources, there are a number of measures that can be taken to encourage them to expand into down-stream processing locally. Joint ventures between the host governments and foreign enterprises can be established with a distribution of profits based on their equity share, or as otherwise agreed, and perhaps complemented by a range of service contracts and various other incentives to induce multinational corporations to invest in local processing facilities. Another possibility is to leave foreign investors to operate in the field of primary product and raw material production but to specify that a quantity of output be made available to local LDC processing industries, which thus enter only at the processing stage. A privileged position in supplying the local market with the processed product could also be one of the inducements for attracting investors, local and foreign, into domestic processing in the LDCs.

To enact such inducement measures a variety of policy instruments are available to LDC governments, of a contractual, administrative and legislative nature. The most important measures of the latter type are tax rebates which include special tax holidays and differential tax rates on dividends, rate reductions, accelerated depreciation allowances and so on. However, in some situations methods more directly aimed at processing may be more effective; for example varying the royalties on raw materials as between domestically processed and those exported unprocessed; imposing export quotas or levying export duties on unprocessed raw materials. It has been suggested that a general export tax on all primary commodities levied by LDCs could also serve to move the terms of trade in their favour.(7)

Tax incentives may also be used to regulate the repatriation of profits and determine re-investment policies: for example the amount of earnings that foreign enterprises can repatriate could be made conditional upon the degree of processing they undertake domestically; it could be stipulated that a certain percentage of profits must be re-invested in domestic processing facilities and so on. Even without specific link, agreed limitations to the repatriation of profits can serve as an incentive to invest them in processing facilities. However, a drawback with such financial measures is the uncertainty of how much actual downstream processing will result, whereas with contractual arrangements specific projections can be made; with such a safer basis for projections, a longer-term perspective can be taken which is helpful for planning purposes. Contractual agreements may contain certain processing obligations, as for example, foreign investors committed to buy a proportion of LDCs' domestically processed output. There can be more direct obligations to process domestically, subject to such sanctions as financial penalties, forfeiture of the right to renew the agreement and LDCs' right to terminate it. Joint ventures, licensing and management agreements between the host government and the foreign enterprise can also deal specifically with the transference of technologies necessary for establishing processing industries.(8) Governments should additionally establish national institutions to cover problems relating to access to and acquistion of processing technology from multinational corporations and other sources. This is a part of the general problem of developing an appropriate science and technology policy - a subject which will be under discussion in connection with the 1979 UN World Conference on Science and Technology in Economic Development (UNCSTED). The processing technology for an LDC's major natural resources should normally be among the priority areas of that country's science and technology policy and institutions.

In the postwar period, as so many LDCs have attained political independence, they have increasingly sought control over their own natural resources, often by way of nationalisation. A UN study (9) shows that 45% of the nationalisation which occurred between 1960 and 1971 was concerned with raw materials and that from 1971 to 1974 this had risen to 62%. Nationalisation may on the one hand result solely from unilateral action taken by LDCs, but in other cases the companies themselves may have welcomed and initiated such moves.(10) Most commonly the conditions of partial or full take-over will be mutually negotiated between the foreign enterprise and LDC host government. However, despite nationalisation at the raw material stage, LDCs may still face the previously discussed constraints to the development

of domestic processing. To the extent that they remain dependent on foreign investors for technology and marketing and distribution outlets the concept of 'permanent sovereignty over natural resources' may not have much effect upon the location of processing facilities. Different measures can be pursued to overcome these barriers in conjunction with any policies of nationalisation or other methods of strengthening 'sovereignty'. But such measures are relevant to any progress with raw material processing, whether foreign investment is involved or not.

In many cases there do exist independent firms or rival corporations with whom LDCs could make contact and seek to establish marketing and distribution outlets for processed products. Measures can also be taken to encourage direct co-operative links with other state enterprises, both within LDCs and developed countries, including the centrally planned economies. All instances where a mutuality of interests and useful knowledge exist should be exploited and fully utilised.

General marketing measures include establishing organisations such as Trading Corporations to undertake joint marketing arrangements.(11) These could deal with distributing in local markets through retail shops and consumer co-operatives; develop an international brand image for the domestically processed good; encourage quality control and (in the case of food products) health legislation; promote exports, including participation in International Trade Fairs. Trade Banks could be established to provide export insurance, banking services and other information regarding the export of processed goods. Government policies should encourage and pursue all 'potential' market openings;(12) sectors of 'buoyant demand' like many of the food processing industries should be fully exploited especially where LDCs may develop a competitive advantage. Important areas are speciality products, goods for the catering and institutions market, animal feedstuffs, and also the supply of domestic markets with local brands. In all these respects, the promotion of domestic processing is not essentially different from the promotion of domestic manufacturing in general.

Government agencies, such as a Food Corporation, as well as being concerned with nutrition programmes etc., can identify which are the priority areas to be developed, plan production according to different capacities, provide financial help like long- and medium-term loans to processing firms, and encourage the Government to use fiscal facilities e.g. duty-free admission of processing equipment and other necessary inputs.

The establishment and expansion of certain types of domestic food processing in developing countries is also very desirable on nutritional grounds, particularly in relation to young children. The protein requirements of young children are so high in relation to their small absorptive capacity for bulk food that specially processed and nutritionally fortified foods for young children can play an important role in preventing malnutrition, with possibly irreversible effects on the future physical and mental development of the children concerned. In the absence of domestic processing of this kind the special baby food and children's food concerned will be imported, when in fact it could be based on domestically produced food. This would also have higher acceptability for the local population.

Where regular raw material supplies are critical to particular developed economies, there may be openings to negotiate direct agreements between either private companies or state controlled enterprises in the source LDC and in the importing developed country without recourse to multinational corporations. In such cases, the importers or the government of the developed country may be induced to provide private capital for investment in LDC processing facilities. (13)

A number of the international organisations are concerned with technology transfer and marketing problems as they relate to processing industries. The UNDP Country Programmes include a range of processing projects, carried out either by UNIDO or FAO, including feasibility studies, market surveys and pilot projects. Technical assistance is given in the establishment and operation of processing plants, particularly with the acquisition of 'processing skills' and the necessary training. This is in addition to various projects under the FAO direct assistance programmes which provide for training institutes for personnel in processing industries, help with the establishment of research institutes to look into different processing techniques, and investment appraisals, feasibility studies and pilot programmes. In the FAO Industry Co-operative Programme emphasis was given to projects which increase LDCs' industrial capacity and add to the value of domestic production by local processing. In particular the FAO Agro-Industry Strategy Import-Export Co-operative Programme (IECP) is designed to link LDC producers to large retailing organisations in DCs. The aim is both to expand the supply base and to encourage the relocation of processing capacities to LDCs.

This leads directly to the issue of 'Redeployment': this was the direct outcome of the Lima Declaration (Second UNIDO World Conference 1975), which stated that "... the redeployment of certain productive capacities existing in DCs and the creation of new industrial facilities in the developing countries"(14) should be encouraged. Redeployment, a rather ill-defined concept subject to a broad range of interpretations, as it relates to processing industries involves the following: a shift of processing capacities to LDCs, including physical shifts, concentration of new processing investment in LDCs and the deployment of technology, management services, equipment, etc., as part of a deliberate internationally agreed policy and as an intrinsic component of global industrial restructuring, which in turn is a key element in NIEO (New International Economic Order). There does appear to be a positive response on the part of some companies in the food, leather, pulp and paper, rubber, textile and wood processing industries; and a UNIDO study concludes that there exists a "definite potential for redeployment". (15) However, to the extent that the prime motivation on the part of redeploying foreign investors is to obtain easier access to LDC markets and safeguard sales proceeds, care must be taken that redeployment policies are consistent with other LDC and DC objectives and policies.

The other area of vital importance are the measures to be taken concerning the formidable trade barriers to processing that LDCs face, particularly in the form of tariffs and non-tariff barriers, and often as a result of deliberate commercial policies pursued by the developed countries. A number of international policies have been initiated but, given the LDCs' weak bargaining power within the present world economic order, to date

such measures have had little effect on improving the trade position for the processed commodities of the LDCs.

It has been pointed out that one method of supporting the transformation of LDCs from primary product suppliers is to create incentives for the location of processing facilities in the raw material producing countries "by virtually reversing the present tariff structure through a decrease of tariffs on manufactured, semi-manufactured and processed goods exported by LDCs while possibly even levying some tariffs on raw materials imported from them."(16)

The major action that has been taken in this area towards reducing tariffs and eliminating escalation is the General Scheme of Preferences negotiated by UNCTAD. The GSP in principle applies to processed and manufactured goods with 'certain exceptions' and it is these exceptions that determine its presently extremely limited coverage and correspondingly limited role in promoting LDC exports of processed raw materials. Indeed, in general, there is"... a direct correlation between the ability of the developing countries to export and the degree of restraint imposed",(17) in the sense that successful export performance tends to be penalised by restrictions sometimes described as "voluntary". Preference giving countries have generally provided that the GSP excludes primary products, and most especially agricultural products and their processed forms. These exceptions are made in the form of 'negative lists' which in practice also include leather goods, petroleum products and textiles. In addition to these 'exceptions' all countries employ some kind of safeguard as 'escape clause'.

An UNCTAD study(18) recommends five major ways in which the GSP should be improved, which are as follows: firstly, extend the scheme to cover all processed commodities of export interest to LDCs; secondly, all preference giving countries should grant duty-free treatment to all beneficiary items under the GSP; thirdly, all ceilings, tariff quotas and 'maximum amount' limitations should be suppressed; fourthly, under the GSP all LDCs should be subject to 'cumulative treatment', i.e. the stringent origin requirements should be relaxed; and finally, the duration of the GSP should be extended beyond its original ten years in order that it may in fact fulfil its original objectives. All these improvements, especially of course the first, would help with the development of processing in LDCs.

The STABEX scheme, which compensates the EEC-associated African Caribbean and Pacific (ACP) countries for certain shortfalls in their export earnings on selected 'primary products',because of the ill-defined position of most 'processed' products, (19) in fact includes a number of raw materials in processed form, e.g. cocoa paste and butter, coffee extracts, palm and palm kernel oil, and groundnut oil. For those processed products covered, this scheme may well provide encouragement for LDCs to export raw materials in processed form. However, STABEX and the GSP, to be effective in this direction would have to extend coverage to those processed goods which at present fall through both nets.

Other measures include individual commodity agreements, including agreements not to discriminate against imports of the commodity in processed form.(20) OECD countries have pursued policies of 'Orderly Adjustment'(21) which incorporate a variety of schemes to deal with single or small groups

of similar processed products. One such scheme is the conclusion of special agreements which, according to the season and market situation, grant reduced tariff rates or levies, e.g. EEC agreement with Argentina and Uruguay for supply of processed beef;(22) this should be extended to all processed commodities covered. Likewise, there are agreements for specific commodities subject to strong competition, like processed fruit and vegetables, providing for imports from LDCs under duty-free quotas, e.g. EEC imports of canned pineapples and green coffee from East African countries. Another approach to 'orderly adjustment' by OECD countries are the conferences on particular commodities to improve the market situation by providing information exchanges on production and marketing, problems of market access and expansion and so on; an example was the Tripartite Conference of South Africa, USA and Australia 1968 on canned peaches. Finally, all the cuts that are agreed in multilateral trade negotiations should be implemented immediately.

In the field of non-tariff barriers (NTBs) again much work has been done, under the auspices of UNCTAD, on measures which should be taken to reduce barriers to LDC processed exports. These include, firstly, the removal of import quotas (including discretionary licensing) as soon as possible and a number of interim measures like progressively enlarging global quotas, converting discretionary licences, bilateral and unspecified quotas to 'global' quotas etc.; secondly, the removal of variable levies and the exemption of processed products of LDCs from such levies; thirdly, the abolition of prohibitions and embargoes now inhibiting LDC processed exports; fourthly, health and sanitary regulations should be revised, and where no longer necessary, should be removed and relaxed when too stringent, particularly by treating imported and domestically processed goods equally; and finally, UNCTAD recommend that the possible adverse effects of state trading enterprises on LDC processed exports might be eliminated by encouraging, rather, the import of processed products, perhaps by adopting discriminatory pricing policies in favour of LDC processed goods to eliminate any price handicaps.

In principle, thus, all trade liberalisation measures should be extended as far as possible to cover LDC exports of processed raw materials. Obviously, in many cases, there is a need for gradual adjustment particularly where such measures conflict with other objectives. The need, therefore, is to integrate and coordinate to the greatest possible extent all such liberalisation policies; at the same time, the need for adjustment assistance programmes in DCs should not be neglected. Actions and measures taken in the trade field which are generally of broad coverage, can be complemented by development assistance measures of a more selective nature, geared to meet specific needs of specific countries; such assistance can come from UN agencies, or other multilateral or bilateral aid funds: here again there arises a need for the co-ordination of such aid measures with each other as well as with trade liberalisation measures. Joint venture projects can combine the resources of private industry, the advantages of multilateral and bilateral aid, and governmental support.

One last policy measure that relates specifically to trade barriers concerns discriminatory and escalating freight rates. LDCs could collectively improve their bargaining position vis-a-vis the freight conferences and where possible obtain promotional freight rates by forming regional shippers'

councils and 'freight investigation units' to consult and negotiate with liner conferences.

Finally, while the removal of obstacles and constraints to trade should create conditions in the demand still more conductive to the expansion of domestic processing industries in LDCs, there is a strong need for closer co-operation and integration among LDCs to exploit such conditions and to further all possible benefits by "... identifying and promoting regional or inter-regional enterprises among them for local downstream processing of their commodities."(23) Furthermore, "It would seem particularly desirable to seize the opportunities provided by the emergence of surplus capital resources in some LDCs [OPEC countries] to launch a comprehensive programme of regional or interregional industrial enterprises among developing countries for the further local processing of their commodities."(24) Though the expansion of local processing of raw materials for the domestic market is desirable and important especially for many food products,(25) for most processed commodities this alone is"... generally not feasible because of the narrowness of many of these individual domestic markets."(26) The establishment of regional trading zones and preferential trade arrangements for processed products is "... one major area ... where the concept of 'collective self-reliance' among LDCs could achieve concrete meaning."(27) In this connection the establishment of producers associations is important for an improved bargaining position of primary producers in negotiations with the importing countries and also transnational enterprises. Specialisation, with particular countries producing specific processed commodities for a joint market, is also possible. Co-operation between developing countries should be aimed especially at developing indigenous technology for processed primary products, more suited to local conditions. This could help to disseminate, for example, Cuban sugar-cane processing techniques or Argentinian wood-pulp processing technology. Such matters are currently under discussion in the context of the Conference on Technical Co-operation among Developing Countries (TCDC).

Much work has been done in this area by UNCTAD (28)and their recommendations for policy action, as they relate specifically to processed commodities, are basically as follows: that LDCs should go beyond the limited coverage of the 'Protocol Relating to Trade Negotiations Among Developing Countries' by negotiating and developing a system of preferences; which as well as covering tariffs and NTBs could also cover preferences in sources of procurement. Furthermore, there is scope for both extending and strengthening existing regional integration and free trade areas, as well as promoting new groupings; preferential trading schemes could be supported by clearing unions and payment arrangements which provide credit to member countries, allowing them to expand mutual trade with other LDCs in processed commodities without immediate payment in convertible currency. Such payment arrangement (UNCTAD suggests) could well be funded by LDCs with surplus resources (OPEC countries). Another possible measure, where feasible, is accepting repayment of aid from LDCs to other LDCs in the form of processed imports. This last measure could also apply, of course, to aid from DCs to LDCs, with processing possibilities.

TABLE 4.1 Exports of Processed Foods from OECD Countries into Developing Countries - 1969

Million U.S. Dollars

Product	Africa	Latin America	Near East	Asia	Unspecified	Total D.C.
012 Meat, dried, salted	0.8	11.2	-	1.0	2.7	15.7
013 Canned meat	7.6	15.4	6.3	9.1	14.7	53.1
022.1 Milk evaporated)	79.9	91.9	42.0	117.6	7.4	338.8
022.2 or dry)						
023 Butter	12.4	9.3	11.2	12.5	2.7	48.1
024 Cheese and curd	15.1	8.6	7.7	0.9	5.6	37.9
032 Canned fish	9.7	11.0	6.7	33.5	10.1	71.0
046 Meal and flour of wheat	33.1	63.1	54.4	75.9	5.5	232.0
048 Cereal preparations	31.2	36.3	9.2	43.8	5.5	126.0
052 Dried fruit	0.6	4.6	-	2.9	1.5	9.6
053 Preserved fruit	2.8	11.6	4.0	5.6	5.0	29.0
055 Preserved vegetables	13.6	10.9	9.9	10.5	6.6	51.5
062 Sugar confectionery and sugar preparations	5.5	6.4	4.5	6.8	5.4	28.6
072.2,.3 Cocoa butter, paste	3.2	0.2	2.2	2.1	34.6	42.3
073 Chocolate, cocoa preparations	3.7	3.8	4.1	6.6	4.8	23.0
081.3 Oilseed cakes, meals	0.5	6.0	2.8	5.6	1.4	16.3
081.4 Meat meal, fish meal	0.1	0.2	0.5	2.7	1.0	4.5
099 Food preparations n.e.s.	17.9	36.6	17.2	26.2	8.2	106.1
112.1 Wine and must	33.0	12.6	0.5	2.5	6.7	55.3
112.3,.4 Beer, distilled alcoholic beverages	32.5	64.4	12.0	36.8	11.9	157.6
411.1 Oil of fish	-	0.5	0.1	1.1	1.0	2.7
411.3 Animal oils, fats	9.2	18.0	10.3	27.3	6.6	71.4
421,422 Vegetable oils	29.7	45.7	23.7	59.3	5.4	163.8
431 Animal, vegetable oils and fats, processed	4.2	6.8	7.1	4.9	4.2	27.2
Total of above	345.3	475.1	236.4	495.2	158.5	1,711.5

SOURCE: FAO Working Paper ESCR:Misc.73/1.

Footnotes

1. See OECD, Processed Agricultural Products, pp.30-31; also E.B. Simmons, "The Small-Scale Rural Food-Processing Industry in Northern Nigeria".

2. OECD, Processed Agricultural Products, p.33 para 70.

3. See in particular UNIDO, Industrialisation of the Least Developed Countries (ID/WG.234/13).

4. OECD, Processed Agricultural Products, p.28 para.53.

5. Ibid., p.29 para 56.

6. UNCTAD, An Integrated Programme for Commodities (TD/B/C.1/197), p.12 para 31.

7. W.A. Lewis, The Evolution of the International Economic Order.

8. The next section relies on UNCTAD TD/B/C.1/197, especially p.13, paras.34-37.

9. UNCTC, Transnational Corporations and the Processing of Raw Materials, pp.24-25.

10. Ibid., p.28, for examples.

11. OECD, Processed Agricultural Products, pp.35-37, especially for general marketing strategies.

12. For 'perennial' markets within LDCs see Table 4.1 (and also Section II); NB: particular relevance to possibilities of 'regional trading zones'.

13. Z. Mikdashi, The International Politics of Natural Resources, pp.20-21.

14. UNIDO, Lima Declaration, para 61(d).

15. UNIDO, The Redeployment of Industries from Developed to Developing Countries.

16. K.P. Sauvant, "The Poor Countries and the Rich".

17. L.N. Rangarajan, Commodity Conflict, p. 153.

18. UNCTAD, An Integrated Programme for Commodities (TD/B/C.1/197), pp.6-7.

19. See Section I on problems of definition of processed commodities.

20. UNCTAD, An Integrated Programme for Commodities (TD/B/C.1/197), pp.16-17.

21. OECD, Processed Agricultural Products, pp.44-45.

22. Ibid., p.44.

23. UNCTAD, Integrated Programme for Commodities (TD/B/C.1/197), p.14.

24. Ibid., p.15.

25. OECD, Processed Agricultural Products, pp.10-11, especially the example cited: "UNIDO ... suggests that for factory produced oil and/or oilcake, approximately 75% of the total output should be absorbed by local markets to ensure that the oilseed processing industry is economically viable".

26. UNCTAD, Integrated Programme for Commodities (TD/B/C.1/197), p.11.

27. Ibid.

28. Ibid., pp.10-11 and 14-15.

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APPENDIX 1

PROCESSED RAW MATERIALS - APPROPRIATE SITC HEADINGS

SITC (Rev. 2) HEADING

A - FOODS, FEEDSTUFFS & BEVERAGES

011 - Meat (fresh, frozen)(1)

012 - Meat (salted, dried, smoked)

013 - Meat (preserved)

022 - Milk & Cream (fresh, concentrate, sweetened, powdered - including yoghurt, sourmilk, skimmed milk etc.) (1)

023 - Butter

024 - Cheese & Curd

025.2 - Eggs (not in shell)

035 - Fish (dried, salted, smoked)

036 - Crustaceans & Molluscs (fresh, frozen, salted)

037 - Fish & Crustaceans (preserved, prepared) n.e.s.

046 - Meal & flour of wheat & meslin

047 - Other cereal meals & flours

048 - Cereal preparations (including breakfast foods, malt & malt extract, pasta, bakery products)(2)

054.6 - Vegetables (frozen, preserved)

054.8 - Vegetable products (fresh, dried)

056 - Vegetables, roots & tubers (prepared, preserved) n.e.s.

058 - Fruit (preserved, prepared - including jams, fruit juices etc.)

061.2 - Refined sugars

061.9 - Other sugars (including syrups, artificial honey, caramel)

062 - Sugar confectionery(2)

071.2 - Coffee (extracts, essences, concentrates - includes chicory & other substitutes)

072.2 - Cocoa (powder)

072.3 - Cocoa (butter, paste)

073 - Chocolate[2]

081 - Animal feeds (includes bran, oil cakes, other food wastes & by-products - excluding 081.1)

091 - Margarine & shortening

098 - Food preparations, n.e.s. (includes sauces, tea concentrates, vinegar etc.)[2]

111 - Non-alcoholic beverages, n.e.s.

112 - Alcoholic beverages

223.9 - Flour & meals of oilseeds & oleaginous fruit

411 - Animal oils & fats

423 - Fixed vegetable oils, soft

424 - Other fixed vegetable oils

43 - Animal & vegetable oils & fats (processed) - excluding 431.4

B - NON-FOOD PRODUCTS

122 - Tobacco (processed)

431.4 - Waxes of animal & vegetable origin

611 - Leather

613 - Furskins(tanned, dressed)

621 - Rubber materials (pastes, plates, sheets etc.)

248 - Wood (simply worked - including railway sleepers)

634 - Veneers, plywood, reconstituted wood (worked) n.e.s.

244.02 - Cork, natural (blocks, plates, sheets, strips)

641 - Paper & paperboard

651 - Textile yarn (including jute & other vegetable textile fibres)

652 - Woven cotton fabrics

654 - Other textile fabrics (excluding man-made fibres)

291.1 - Bone, horn, ivory, tortoise-shell, coral (simply worked)

C - NON-AGRICULTURAL PRODUCTS[3]

67 - Iron & steel (bars, plates, hoops, wire, pipes etc., - excluding 671 & 672)

681.14 - Silver (bars, rods, sheets, wire etc.)

681.25 - Platinum (" ")

682.2 - Copper & copper alloys (worked)

683.2 - Nickel & nickel alloys (worked)

684.2 - Aluminium & aluminium alloys (worked)

685.2 - Lead & lead alloys (worked)

686.3 - Zinc & zinc alloys (worked)

687.2 - Tin & tin alloys (worked)

691 - Iron, steel & aluminium structures, n.e.s.(4)

692 - Metal containers for storage & transport (4)

693 - Wire products(4)

NOTES

(1) SITC does not provide a separate category for 'fresh', although some commodities better classified as unprocessed.

(2) These commodities might arguably be better classified as manufactures.

(3) Excludes fuel minerals and other non-metallic minerals.

(4) Recommended for inclusion as processed in UNCTAD, An Integrated Programme for Commodities, (TD/B/C.1/197)

APPENDIX 2

ENVIRONMENT AND PROCESSING INDUSTRIES

It has been suggested that LDCs "... should explore the possibilities of increased specialisation in certain industrial fields, both for home market production and export purposes, which are going to become more costly for the developed world because of their growing concern with environmental standards. Such efforts should not, however, lead to an indiscriminate export of pollution by developed countries or to a discarding of environmental standards adopted by the developing countries."(1)

Whilst this line of argument is frequently being taken, the whole question bristles with controversy: Positions range from those "who argue vigorously that there should be no export of pollutive industries"(2) to those who see the increasing rigorous pollution standards in industrialised nations as providing a unique opportunity for a redistribution of global industrial capacity, which should be willingly undertaken.

Indeed it is the case that anti-pollution measures in developed countries might well provide a stimulus to increasing processing of raw materials in LDCs. This is especially likely with metal extracting and processing industries, and the paper and pulp industries which are highly polluting; similarly with the petro-chemical industries. Developed countries anxious to ensure supplies and avoid polluting effects, are increasingly likely to invest in processing industries located in LDCs. Japan, for example, has invested in oil-refining plants in the Middle East, Indonesia and elsewhere.(3)

Whilst there is some evidence that the costs involved in meeting environmental standards may be less for LDCs(4) - e.g. cheaper to incorporate controls in new plants than to adapt old - the magnitude is still substantial. It has been estimated that compliance with both adopted and pending environmental standards would mean a 5-10% rise in production costs.(5) Costs vary according to the production stage; compliance with regulations in the transformation stage of copper into blister copper where sulphur emissions are especially high, would mean nearly a doubling of smelting costs.(6)

It is suggested that LDCs have an advantage whereby, in many instances, they have not reached the threshold after which pollution has rapidly increasing serious effects. However, arguably, "... smaller amounts of pollution have greater impact on the peoples of developing countries, where streams are used as principal sources of water supply and

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(1) Development and Environment, Report of the Panel (Founex, Switzerland, June 4-12 1971), pp.41-42.

(2) Ibid., pp.35-36.

(3) UNIDO, Industrial Development Survey, p.148.

(4) UNCTAD, "The Implications of Environmental Measures for International Trade and Development", in Development and Environment, p.196.

(5) UNCTAD, "The Implications of Environmental Measures for International Trade and Development", in Development and Environment, p.190.

(6) UNIDO, Industrial Development Survey, p.149.

where the mobility to escape from pockets of air pollution is less."[7] Furthermore, one likely long-run effect of more stringent environmental measures is the development of new, less-polluting technologies with perhaps significant quality advantages. Therefore LDCs must assess carefully the costs and benefits of investment in capacities which might soon be rendered obsolete or inadequate.

A further impact that environmental measures have on world trade is the application of various health controls, standards, import regulations and other NTBs (non-tariff barriers). For these are primarily on processed food imports (carrying DDT traces, etc.), and whilst not directly restricting trade practices they have the same effect.

Furthermore, developed countries are demanding import restrictions against LDC products where they do not take account of environmental regulations. This argument of 'sweated environment' in order to protect domestic industries is similar to 'sweated labour' : "... equally fallacious but even harder to beat".[8]

A number of policies proposed to deal with both increased costs and more stringent import regulations have been suggested and demands made that "... action should be taken to cushion their [import-restricting] disruptive effect through a system of prior consultations and warnings by developed countries of contemplated environmental actions."[9] Further, where appropriate, aid should be channelled to LDCs to adapt their processing industries so affected. One suggestion is the setting up of a 'Special Fund' to cover increases in costs of development programmes due to higher environmental standards.

The Founex Report[10] concludes that as long as certain safeguards are provided - i.e. that foreign investment adds to the net transfer of resources to LDCs, is on favourable terms and conditions, and conforms to LDCs' own environmental standards - there is no reason why LDCs should not therefore specialise accordingly.

Ultimately priorities regarding the relationship between development and environment must be established by LDCs on their own terms, with a consequent enumeration of the possible costs and benefits. In other words, this "... is a policy decision to be taken by each country with due regard to the concrete situation in the country and its strategy of development."[11]

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(7) United Nations Conference on the Human Environment (UNCHE), "Environmental Costs and Priorities: A Study at Different Locations and Stages of Development", in Development and Environment, p.155.

(8) Development and Environment, Report of the Panel, p.30.

(9) UNCTAD, "The Implications of Environmental Measures", in Development and Environment, p.191.

(10) Development and Environment (Founex, Switzerland, June 4-12 1971).

(11) UNCTAD, "The Implications of Environmental Measures", in Development and Environment, p.198.

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