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LINKAGES BETWEEN MANUFACTURING AND OTHER SECTORS OF THE ECONOMY IN THE LEAST DEVELOPED COUNTRIES (LDCS)*

Prepared by the

UNIDO Secretariat

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PREFACE

Pursuant to the Paris Declaration and a Programme of Action adopted in the Second United Nations Conference on the Least Developed Countries (LDCs) held in Paris from 3 to 14 September 1990 UNIDO, with financial support from the Government of Italy, decided to organize a Workshop on industrial development in the LDCs. The aim of the Workshop is to review the status of industry and to analyze some key issues of industrial development in the LDCs. The proceedings of the Workshop will form the basis of an industrial action plan for the LDCs to be submitted to the Fourth Session of the General Conference of UNIDO in November 1991.

Key issues facing the process of fostering industry in LDCs have been identified for discussions during the Workshop One of these issues is manufacturing linkages to the other economic sectors in the LDCs. The linkage issue forms the theme of this paper.

This paper suggests that the linkages within the manufacturing sector are weak and that manufacturing linkages to the economic sectors of the LDCs are not intricate or well developed. Evidence shows, however, that the overall linkages of manufacturing to the services sector tend to be relatively strong. Also, the potentials for strengthening the economic linkages for accelerated development are found to exist. One of the most important strategies identified for strengthening economic sector linkages and development is the resource-based strategy.

To address effectively the issue of study, this paper presents a conceptional framework, an empirical analysis, interpretation and evidence with reference to manufacturing linkages to the economy, a summary of study and proposals and bibliography.

This paper has been prepared by staff of the Regional and Country Studies Branch based on inputs provided by Benjamin O. Botchway as UNIDO consultant.

CONTENTS

1. INTRODUCTION

The aim of this paper is to analyze how the manufacturing sector in the LDCs is linked to the rest of the economy and the extent to which each sector depends on the other. On this basis, it attempts to examine how such links can be maintained, strengthened and managed in the future.

1.1. The linkage concept

The concept of linkages is variously discussed.[1] Generally, one observes linkages at both the macro- and micro-economic levels. These can be further classified as direct and indirect linkages. Macro, as well as indirect linkages, may result when agriculture, for example, produces crops for export and provides as a result foreign exchange to finance industrialization. What is important and noteworthy in this relationship is that when agriculture stagnates, industry would possibly stagnate as well. Micro-linkages concern the way in which economic sectors interact with reference to the demand and supply of commodities.

When a domestic sector supplies or receives inputs from another sector, it may create not only micro or direct linkages, but also intermediate (or immediate) linkages. When, for example, domestic manufacturing supplies agriculture with pesticides, fertilizers and machinery inputs, a possible reverberant impact on the economy is made. This may be in the form of foreign exchange savings, and increases in domestic value added and employment.

A less immediate, but important macro-linkage may result when a sector is stimulated by another sector to create multiple effects in the economy. This type of indirect or induced linkage may result, for example, when manufacturing receives an effective stimulus from agriculture. This may, in turn, increase manufacturing demand for input from the other sectors, employment, additional consumption, and operational surplus for further investment.

Besides the consumption related linkages, the examples of which are given above, one identifies another class of linkages. This is production linkages which comprise the backward and forward linkage types. Backward linkages occur where productive activity in one sector requires inputs from another. Forward linkages on the other hand occur where the production of a commodity provides supplies for productive activities in the other sectors. Agriculture may, for example, have a backward linkage with manufacturing when it uses fertilizer, pesticides, and agricultural machinery in its production processes. Similarly, when agriculture produces goods as inputs in the food processing sector, it establishes a forward linkage to manufacturing.

The decision in agriculture to purchase local machinery and inputs implies not only increased demand for manufactures, but also an important relationship known as investment linkages. Likewise, the decision in agriculture to put up new storage and infrastructural facilities involves investment linkages. This will mean a boost to the construction sector which will in turn rely on the building materials coming from the manufacturing sector.

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[1] See some earlier approaches to the concept of linkages and its measurements in, Panchamukhi, V.R., Linkages in industrialization: a study of selected developing countries in Asia, in Journal of Development Planning, UN Publication, Sales No. E.75.II.A.I, June 1976.

What is more important in a linkage analysis is to specify which sector is the main focus of study, and in part which sector is conceived to be the initiating and causal agent of the linkage.

Linkages may be actual or potential. Productive activity in a sector may require imported inputs. The demand for these inputs may activate domestic production of those inputs to meet demand. In this case, a potential backward linkage becomes an actual when domestic production of inputs meet demand. Furthermore, an existing production of a commodity may initiate and encourage new productive activities that uses that commodity. This relationship depicts a potential forward linkage that may become actual. Normally, potential backward linkages are more likely to become actual than forward ones, because the existence of a demand for a product seems more likely to generate domestic production. For a potential forward linkage to become actual requires that a domestic product induces a new activity that uses that product.

1.2. The importance of linkages

The significance of linkages as a factor explaining and influencing economic performance has been often neglected in development policy strategies. Performance in agriculture, for example, has been conventionally viewed as the consequence of the inflow of physical, technology and organization inputs. Similarly, industrial performance has been assessed mainly in terms of physical inputs, especially, the rate of capital accumulation, technological change, and trade orientation and whether it involves import substitution and export promotion.

The linkages between economic sectors (involving transactions, the flow of goods and services, labour and finance) is functional for successful development. Such linkages will be affected by the existing structure of each sector, as well as by infrastructure and policies. The extent of such linkages influence the degree to which the different activities of the economy form an interdependent, complex and functioning whole.

In most LDC's economic sectors are seldom linked, they are usually isolated from one another, grow in isolation and are hardly supportive of each other. Whilst the economic sectors in the LCD's have failed to generate significant linkages capabilities, those in the most advanced newly industrialized countries have succeeded in creating effective linkage capabilities. The question to ask here is whether economic growth was accompanied by linkages, or vice versa. But, one thing for sure is that economic growth is a process which generates the possibilities of linkages among economic sectors. When utilized, such linkages will promote further expansion in economic growth. Besides linkages in the domestic economy, linkages in regional/sub-regional grouping can promote economic growth and integration. International investment capital inflows into key manufacturing sectors or services sector (such as banking and insurance) in a national or regional/sub-regional economy can generate economic linkages.

1.3. Methodology to linkage analysis

In most empirical linkage analysis, especially of forward linkages aggregate input-output approach is adopted. It helps to delineate the impact of changes in demand than that of changes in supply. It is, however, a limited approach because it cannot be used to delineate investment linkages whose source is rather in-continuous.

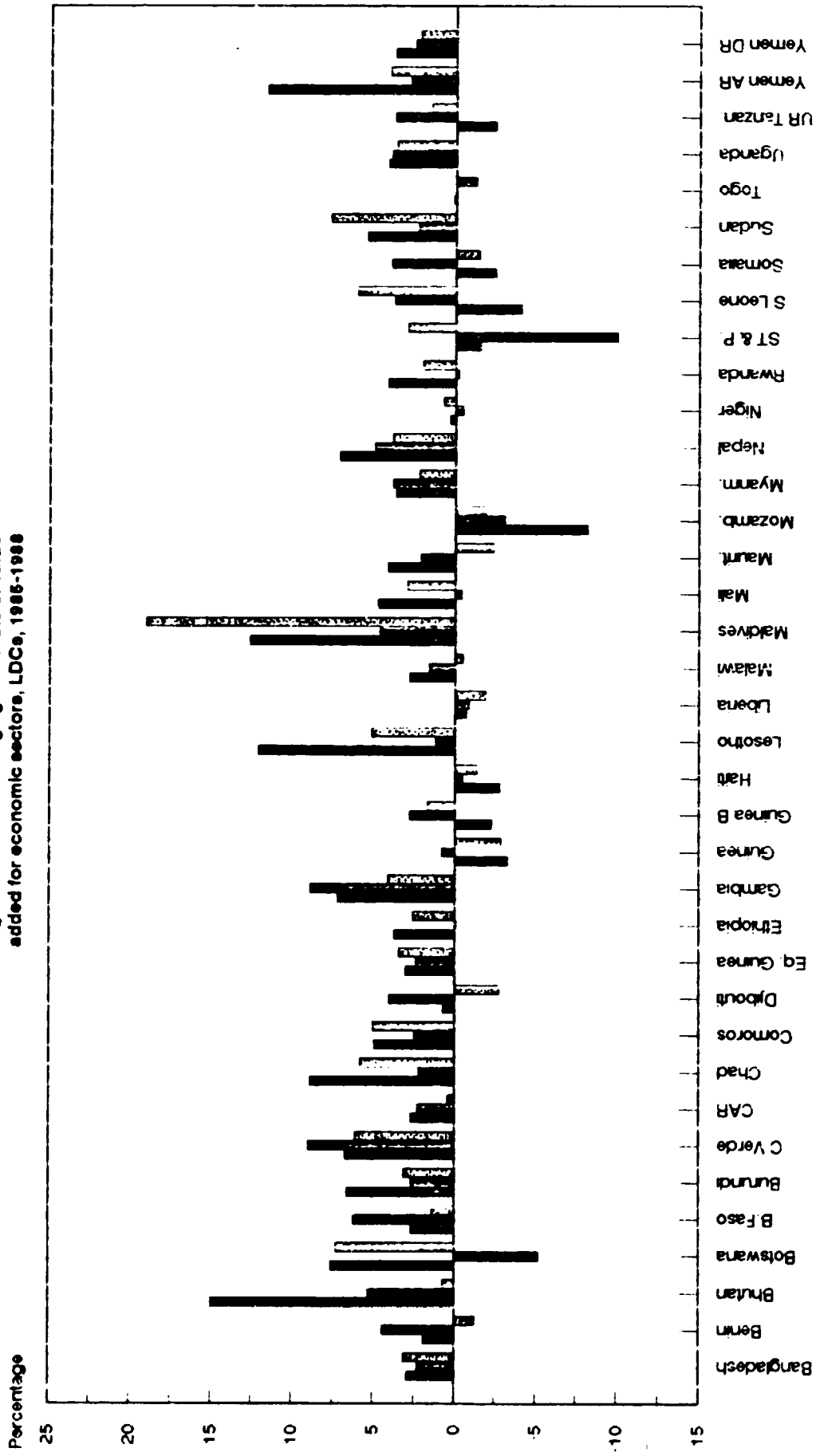
Moreover, the application of an input-output analysis is not within the scope of this work. Regression analysis and other approaches based on available statistical data is, however, employed to help delineate linkages in the economic sectors of the LDC's.

To serve the purposes of this work, two approaches to the delineation of linkages are adopted. The first is based on regression model, and the second analysis of statistical data and country-review approach. These would help shed light on linkages in general among the LDCs, and where relevant on country-based linkages (the selection of specific countries to elaborate specific linkage types do not imply that linkages or linkage potentials do not exist in the LDCs not cited under the topic of discussion, the country and the linkage examples cited in this paper depend largely on literature available).

2. EVIDENCE ON LINKAGES

Evidence from the regression analysis on a sample of 37 LDCs indicates that the annual growth rate of trade and services is the main determinant of manufacturing growth rate between the period 1985 and 1988 (see Appendix 1). Thus, suggesting that the linkages of manufacturing to the fastest growing services sector in the LDCs is significant. Further enquiries into this crucial relationship will be made in the following chapters (see figure 1).

Figure 1: Annual average growth rate of value added for economic sectors, LDCs, 1985-1988



Source: UNIDO database, PPD/REG

2.1 Overall linkages

A global GDP structure is presented in table 1. Compared to both developed and developing countries, LDC's share in world GDP between 1980 and 1991 is relatively minimal lying between 0.68 and 0.71 per cent. Their share of MVA is not all that large, on the whole, it contributes about 0.2 per cent of world MVA between 1980 and 1991. Qualitatively, the LDC's made very little progress in manufacturing, annual growth of MVA per capita ranged between -2.62 and 1.65 per cent.

Table 1: GDP, MVA and populati Developing* Countries 1980–1991(in 1980 constant prices US dollars)

	Share in World GDP Per cent			Share in world MVA Per cent			MVA growth rate Per cent				MVA per capita Per cent			
Year	Developed	Developing*	LDC	Developed	Developing*	LDC	World	Developed	Developing*	LDC	World	Developed	Developing*	LDC
1980	79.17	17.67	0.71	87.14	12.61	0.25	1.23	0.69	5.01	4.25	-0.49	-0.04	2.55	1.65
1981	79.03	17.67	0.71	87.03	12.72	0.25	1.27	1.14	2.19	0.07	-0.53	0.41	-0.26	-2.36
1982	78.63	17.87	0.73	86.77	12.98	0.25	-0.50	-0.80	1.54	0.63	-2.28	-1.50	-0.92	-1.77
1983	78.78	17.54	0.71	86.93	12.82	0.24	3.93	4.13	2.65	1.33	2.15	3.41	0.15	-1.08
1984	78.74	17.34	0.69	86.88	12.89	0.23	6.72	6.66	7.28	-0.20	4.91	5.94	4.69	-2.60
1985	78.61	17.19	0.68	86.89	12.89	0.22	4.05	4.06	4.05	0.47	2.34	3.39	1.58	-2.62
1986	78.49	17.14	0.68	86.42	13.36	0.22	2.65	2.10	6.38	3.62	0.89	1.47	3.90	1.00
1987	78.29	17.08	0.68	86.32	13.47	0.22	4.39	4.26	5.24	2.65	2.60	3.64	2.93	0.01
1988	78.20	16.94	0.67	86.51	13.28	0.21	5.64	5.88	4.15	1.97	3.93	5.28	1.79	-0.72
1989	78.19	16.91	0.68	86.53	13.26	0.21	3.70	3.71	3.58	3.49	1.89	2.9.	1.20	1.09
1990	77.90	17.06	0.69	86.25	13.54	0.21	0.92	0.59	3.05	2.46	-0.72	-0.09	0.91	-0.03
1991	77.52	17.26	0.69	85.75	14.00	0.22	-0.04	-0.57	3.31	3.75	-1.75	-1.25	1.00	1.16

Source UNIDO database

* Developing countries excluding China and LDCs

*1991 estimated

The agricultural sector contributes a greater share of the GDP of the LDC's than in the developed economies. Whereas its share decreased from 46 to 42 per cent between 1975 and 1988, manufacturing's share on the other hand, remained almost constant at about 7 per cent between the same period. Table 2 shows the relative importance of the sectors. It can be observed that agriculture registered a falling average annual growth rate. Compared to agriculture, MVA growth rate rose and then fell slightly between 1986 and 1988. Mining and quarrying and utilities made significant growth in 1988.

On the whole, agriculture stagnated, a trend which is highly likely to have affected the growth of manufacturing.

The declared aim of industrialization in many LDCs has been to alleviate poverty, especially rural poverty through the establishment and promotion of large-, medium- and small-scale industries based on locally available raw materials. A resource-based strategy of industrialization using locally available raw materials should enable manufacturing to establish backward linkages with agriculture (forestry, livestock,etc.) and mining. The products from the manufacturing sector should have comparative advantage in production costs over those based largely on imported raw materials.

Experiences so far show that there is an element of weakness in inter-industry linkages and inter-sectoral integration in the LDCs. This is partially due to shortages of basic raw materials including power and water, lack of investment capital, shortage of skilled labour and managerial personnel, lack of entrepreneurial potentials, lack of spare parts and inefficient technology, small size of domestic and foreign market openings and ineffective economic and industrial policies etc. The net effect of all these is a low rate of capacity utilization in manufacturing. A possible solution to the poor state of industrial performance in the LDCs would be the formulation and effectuation of a long-term policy framework and proper planning for accelerated socio-economic growth.

In sum, the range of manufacturing having close linkages with other sectors in the LDCs can be said to be relatively narrow. This conclusion is made without any strong empirical justification, since input-output statistics are hardly available. Comparatively, however, the inter-sectoral linkages (manufacturing and agriculture etc.) may seem to be more developed than the inter-industry ones. In African LDCs, for example, inter-industry linkages do not appear to be strongly developed.[2] The dependency of LDCs manufacturing on imported intermediate goods, including spare parts and machinery is high, although foreign exchange has become very scarce. The consequences of foreign exchange scarcity, raw material shortages, lack of qualified and skilled personnel, poor infrastructural facilities, short-sighted policies, small domestic and foreign markets, etc., is the mal-functioning of most manufacturing industries in the LDCs. The emergence of a viable and developed structure of inter-linked manufacturing enterprises in the LDC is a matter of time, but sound industrial policies which relate to linkage features in both industry and economic sectors would be needed to develop manufacturing.

Studies[3] show that inter-industry linkages are weak in the Arab Republic of Yemen, Bangladesh, Ethiopia, the Central African Republic, Lesotho, Tanzania and Mauritania to mention a few. The main reason that could be given is that there is little production of intermediate goods.

A survey of the manufacturing sector of the Arab Republic of Yemen conducted in 1984 showed that as much as 70 per cent of the inputs used by large-scale enterprises were imported. The implication is that virtually no linkages between enterprises in the manufacturing sector exist.

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[2] UNIDO, Regenerating African Manufacturing Industry: Country Briefs, PPD.97, 17 November 1988, p.203.

[3] UNIDO, Industrial Development Review Series, Yemen Arab Republic, PPD.130/Rev.1, 7 December 1989, p.13., Bangladesh, PPD.114, 25 April 1989, p. 71., Ethiopia, PPD.185, 21 February 1991, p.49., Mauritania, PPD.115, 27 April 1989, p.20. Manyeli, K., and O'Neill, B., Draft Programme for the Second Industrial Development Decade for Africa (IDDA II): Lesotho, December 1990, p. 29., UNIDO, The Regeneration of the Tanzanian Manufacturing Industry with emphasis on Agro-based Industries, PPD/R.26, 14 June 1989, p.28.; World Bank, Central African Republic, Country Economic Memorandum, Report No. 5332-CA, 22 August 1985, pp. 34-35.).

Inter-linkages within Bangladesh's manufacturing industry are not developed. Although lower than most Sub-Saharan countries, the share of imported raw material in total manufacturing purchases made by Bangladesh estimated 29.7 per cent in 1982/83.[4] Almost all the cotton for the textile and garment industry, for example, is imported from India and Pakistan, since the country produces virtually no cotton. There is the need for strengthening the linkages between the small- and large-scale enterprises in order to increase the proportion of local sourcing of intermediate and capital goods for manufacturing. The metal working branch of manufacturing seems to assume the key element in industrial development. They form the main focus in the manufacturing inter-linkage process. They form the nest of improvised production technology and are capable of establishing sub-contracting links with the large manufacturing enterprises in Bangladesh.

In general, backward and forward linkages are weak in both Lesotho and Mauritania. But in Lesotho, however, one important linkage concerning small-scale producers is the sub-contracting arrangements between large and small enterprises in both knitting and shoe manufacturing. When developed, sub-contracting among both local and foreign enterprises would involve the transfer of valuable technology and information.

Manufacturing in Ethiopia is dominated by state industrial enterprises. It is characterized by low level of integration as a result of the concentration on the production of final consumer goods. Also, inter-industry linkages are weak as there is little production of intermediate goods. Policies protect the producers (mostly state-owned enterprises) of final consumer goods, and provide import duty exemptions for the import of capital and intermediate goods, thus discouraging investments in the sub-sectors that manufacture capital and intermediate goods. There is a need for, and there exist the opportunities for strengthening the inter-industry linkages, particularly by promoting sub-contracting arrangements between the public large-scale enterprises and small-scale private industries and co-operatives. The purchases of tailor-made spare parts by the large-scale public corporations from the small-scale manufacturing enterprises should be intensified so as to establish some degree of interdependency within the Ethiopian manufacturing industry.

Regarding inter-sectoral linkages, evidences show that manufacturing has strong linkages to agriculture in Ethiopia. For example, food processing including meat canning, sugar, spices and textiles and leather products sub-sector maintain backward linkages to agriculture.[5]

Compared to Ethiopia, the level of economic interdependence in the Central African Republic seems to be lower. The development of small- and medium-size enterprises in the Central African Republic has not only been hampered by structural factors such as the landlocked position of the country, the small size of the local market and inadequate industrial policies and measures, but also by the low level of integration between the economic sectors and the weak or non-existent inter-industry linkages. Apart from cotton, coffee and timber processing, manufacturing in the Central African

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[4] BBS, Report on Bangladesh Census of Manufacturing Industry, 1982/83, p. 345, and UNIDO, Industrial Development Review Series, Nigeria, PPD 100, 1988, p. 77.

[5] UNIDO, Ethiopia: The new economic policy and the outlook for a long-term development strategy, PPD/Field, June 1990, p. 15.

Republic is geared mainly towards the production of basic needs like food to cater for the needs of the low-income rural and urban population.

Forward linkages are limited in Tanzania's manufacturing industry, but some examples can be found: the textiles, paper and chemicals industries supply inputs to the packaging industry, the sawmills provide intermediate goods as inputs for the furniture and packaging, and the tanneries inputs to the leather industries.

3. MANUFACTURING LINKAGES TO AGRICULTURE

The inter-relationship between manufacturing and agriculture in the LDCs can be observed from three main perspectives: (a) the inter-sectoral flows of resources from agriculture to industry; (b) the flow of resources from industry to agriculture and; (c) the exchange between agriculture and industrial products.

The four major resource-flows from agriculture into industry are raw materials, food for the industrial labour force and the urban population and export earnings. But in many countries like Angola, Mozambique, Sudan and Bangladesh war, civil strife and natural catastrophes and consequent shortage of agricultural raw materials have impeded the flow of agricultural raw material into industry. The supply of food to feed the industrial labour force could be a beneficial linkage. In this case, the scarce foreign exchange used to import food to feed the people, especially the urban population would be saved, thus giving rise to low labour costs and increasing investment resources available to manufacturing. Similarly, agricultural exports would create another linkage, because foreign exchange earned could be used for importing capital goods, technology and other inputs for industrialization.

Unlike the advanced countries, the flow of resources from industry to agriculture in the form of agricultural equipments, insecticides and manufactured consumer goods in the LDCs is meager.

The structural link between industry and agriculture involves the exchange of products between the two. Evidences from Mozambique, Ethiopia and others have shown that unfavourable terms of trade or exchange face the agricultural sector. Very low prices are paid for agricultural products by the state agricultural marketing boards which do very little to cushion local farmers against the fluctuations of the international commodity markets. The unfavourable terms of trade facing the agricultural sector in many LDCs, partly due to the soaring prices of industrial products caused mainly by the inflationary mark-up pricing tend to make the agriculture supportive role in industrialization ineffective.[6] The low purchasing power of peasant farmers hardly enables them to afford the necessary farming inputs like tractors, fertilizers, hoes, machetes, insecticides etc. The net result of this is low agricultural productivity and low raw materials inputs for the agro-based industries.

The relevance of agriculture to manufacturing lies in the fact that it offers employment and income to the majority of the population and is the export sector and foreign exchange earner of almost all LDCs. More importantly, it supplies food crops and grains especially to the food processing industries, and other important inputs to manufacturing in general. Notable is the healthy backward linkage between the food product and textile and clothing (the main agro-based industries), metal products, and fertilizer industries and agriculture, especially, in Sub-Saharan LDCs. These industries could help improve the performance of agriculture. The use of agricultural inputs by manufacturing would not only stimulate and increase agricultural production (e.g. from commercial farming enterprises), but also expand the domestic market for manufactured products. The actual and potential linkages of manufacturing is not limited to agriculture alone. The metal products industry do maintain some strong forward linkages with the construction,

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[6] UNIDO, Mozambique National Programme, UNIDO, IDDA/IHSD/OD/IPPIS/399, February 1991, p.2.

mining and services sectors. Simple hand tools, utensils and cans produced are used in the services sector.

It has been suggested that the ideal strategy for strengthening linkages between agro-based industries and agriculture is to bring together agricultural production and industry within a single enterprise. Cotton-textile, palm oil-oil palm, tobacco-cigarette, and fruit and vegetable canning industries are well-known examples in tropical Africa and Asia. But, experiences have, however, shown that policies taken for the creation of such single enterprises tend to overlook the social side-effects of the ventures, especially on the rural economy. Not all crops are suited for a single enterprise. Hurriedly set-up single enterprises usually end up in dismal failures. Seemingly, the three necessary prerequisite for modernization and higher factor productivity are the availability of a new and larger market for manufactured products, especially in the rural areas, and the availability of supply of inputs to agriculture.
Also, the viability of an enterprise counts.

The perception of intra- and inter-sectoral linkages is a crucial and initial stage to a realistic industrial development strategy. The formulation and implementation of such a strategy should also relate to other sectors of the economy.

Generally, the capacities of agro-based industries in LDCs are drastically under-utilized. The lack of regular agricultural raw material inputs supply, the shortage and lack of machinery and spare parts and poor storage facilities and infrastructure are partial explanations of capacity under-utilization. This implies that great losses occur in the economy in general and in the agro-based industries including the food processing, paper and packaging, and the textiles sub-sectors which are key sectors of manufacturing in the LDCs.

3.1. Food processing industry

Table 2 shows the relative importance of agro-based industries in the manufacturing sector of selected LDCs between 1970 and 1986. Food processing industries contribute the largest share to total MVA in almost all LDCs. Textiles manufacturing was and is second in the rank of importance.

The role of the agro-related food processing industries in the economic development of LDCs has been increasingly emphasized, especially in both the Economic Recovery Programme and the current Five-Year Plan (1988/89 - 1992/93) of Tanzania. In 1983, food manufacturing contributed about 638.2 million Tanzanian shillings to total MVA, an amount only second to textiles.[7] Meat and diary products, sugar, vegetable oils and fats, grain mill products, fruit and vegetable canning and bakery products were the main manufactured food products that received their raw materials from the agricultural and the livestock sector. The food and the bottling industry maintains forward linkages to the packaging industry and backward linkages to agriculture.

The share of imported raw materials in total manufacturing in Bangladesh is significantly lower than that of the Sub-Saharan LDCs.[8] In food processing industries, the import content is near zero, meaning that most agricultural inputs come from local sources.

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[7] Bureau of Statistics, MFEAP., Survey of Industrial Production, Tanzania, August 1986.

[8] Op. cit., 1982/83, p.354; UNIDO, Industrial Development Review Series, Bangladesh, PPD.114, April 1989, p. 373.

Table 2: MVA shares for selected LDCs, 1970–1986 (per cent, current prices)

	Value added in manufacturing		Food and processing		Textile and clothing		Machinery and transport equipment		Chemicals		Other*	
Country	1970	1986	1970	1986	1970	1986	1970	1986	1970	1986	1970	1986
Bangladesh**	387	1249	30	26	47	36	3	6	11	17	10	15
Benin	19	48	-	58	-	16	-	0	-	5	-	21
Botswana**	5	67	-	52	-	12	-	0	-	4	-	32
Burkina Faso	-	174	69	62	9	18	2	2	1	1	19	17
Burundi	16	102	53	-	25	-	0	-	6	-	16	-
Chad	51	132	-	45	-	40	-	0	-	0	-	15
Ethiopia	149	518	46	51	31	23	0	0	2	3	21	22
Lesotho	3	26	11	12	26	20	0	0	0	0	63	68
Malawi	-	-	51	-	17	-	3	-	10	-	20	-
Mali**	25	100	36	-	40	-	4	-	5	-	14	-
Mozambique	-	-	51	-	13	-	5	-	3	-	28	-
Rwanda**	8	310	86	77	0	1	3	0	2	12	8	9
Sierra Leone	22	47	-	65	-	1	-	0	-	4	-	30
Somalia	26	72	88	46	6	21	0	0	1	2	6	31
Sudan	140	537	39	22	34	25	3	1	5	21	19	31
Tanzania	116	227	36	28	28	26	5	8	4	7	26	31
Uganda	158	152	40	-	20	-	2	-	4	-	34	-
Yemen, AR**	10	491	20	-	50	-	0	-	1	-	28	-

Source: World Bank, World Development Report 1989.

Note: "-" represents missing values.

In terms of production value, food processing is the leading manufacturing activity in Ethiopia. It ranked second in terms of its contribution to MVA (18.6 per cent) and employment (20 per cent) in 1985/86.* More importantly, it has the lowest level of import dependence and strongest backward linkages to the economy. The sector is dominated by four activities namely, primary and secondary grain processing, sugar refining, production of vegetable oils and fats, meat processing and the manufacture of dairy products all of which are oriented towards the domestic market.

Unlike Bangladesh or Ethiopia, the linkages of food processing industries to agriculture in Liberia are very weak. The formulation of comprehensive resource-based industrialization policy in the country may, therefore, be warranted. To some extent, palm oil processing seems to be linked to agriculture. Palm oil is important to the Liberian economy, not only because of its domestic use for human consumption, but also its use as input for domestic soap manufacturing, a rare example of forward linkages in the

* Op. cit., PPD 185, 21 February 1991, p. 61

Liberian manufacturing sector. When these linkages are strengthened large crude palm oil which is exported could be used on a wider scale as an input for other processing industries.

3.2. Paper and packaging industry

Concerning the role and potentials of paper and packaging industry, the Tanzanian industry is a notable example of close linkages to agriculture. Locally grown softwood and waste paper are used as inputs for making pulp and paper. The printing and publishing uses paper as a basic input. Packaging materials such as bags from the paper and packaging industry are very essential for the marketing of food products and other agro-industrial products. Thus far, the paper and packaging industry maintains both backward linkages to agriculture, and various forward linkages to the food processing, pharmaceutical, animal feeds, fertilizer and cement industries. FAO statistics show that Tanzania produced 17,000 and 13,000 metric tonnes of wrapping and packaging paper and board[10] (as compared to Bangladesh: 12,000 and 8,000) in 1987 and 1988 for local consumption and export. According to the current Five-Year Plan (1988/89-1992/93) which assigns priority to agro-related industries, the demand for bags is expected to exceed supply. There are plans to boost production of paper packages to 18,000 tonnes per year by the end of the Five-Year Plan. An expansion of capacity in the paper and packaging sub-sector would benefit the Tanzanian economy in diverse ways: (a) conserve the scarce foreign exchange that would be used for the import of packaging bags; (b) intensify the use of local raw materials and create as a result beneficial intra-industry and inter-sectoral linkages in the Tanzanian economy and; (c) enable the industry to tap fully, the existing large export market reservoir in the Preferential Trade Area (PTA), and establish thereby effective external linkages to the PTA sub-region.[11]

3.3. Textile industry

Textiles account for one-third of MVA and two-thirds of the total employment in the large-scale manufacturing sector of Bangladesh. The small-scale and cottage enterprises of the textiles industry on the other hand contributes a share of about 37.4 per cent to total MVA, and 50 per cent to total manufacturing employment.[12] Bangladesh's textile industry which processes mainly cotton and synthetic products depends largely on imported cotton from India and Pakistan. Cotton spinning capacity is about 1.25 million spindles.

Cotton spinning, a relatively labour-intensive activity in Bangladesh's manufacturing sector has strong forward linkages to the weaving sector. It supplies yarn, especially to the handloom units which form the largest single source of employment in the manufacturing sector of Bangladesh.

The spinning industry also has actual and potential backward linkages to cotton production and production of spare and replacement parts of the textile industry, and, probably, to the machinery and equipment industry. Only 3 to 5 per cent of the cotton used is domestically produced, but there is the hope

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[10] FAO Yearbook, Forest Products, 1986-1987.

[11] UNIDO, Toward an integrated industrial development programme for the PTA, PPD/REG., (draft), 23 July 1990, pp. 31-35.

[12] Op. cit., UNIDO, PPD.114, 25 April, 1989, pp. 42-43.

that the large demand would stimulate domestic production. It has to be pointed out here, that increase in domestic cotton production would be reasonable when comparative advantages of domestic production are higher. Recent growths in certain areas of textile production is generating and increasing the use of imported spare parts and new textile machines. Very little domestic fabric is used in the export garment sector. Export prospects can be improved by producing better quality products with the use of modern dying and finishing and computerized colour matching equipment.

During the early stages of Ethiopia's industrialization (1950s and early 1960s), the textile industry was the dominant manufacturing activity. The textile mills drew their raw materials from local cotton plantations and sold to the domestic market. Presently, the textile branch has been overtaken by the food processing branch as the leading sector. Due to the industrial diversification policy, its contribution to total output has fallen to 20 per cent (1985/86). Between 1978 and 1986, the ratio of imports to total raw material cost in the textiles industry was 32.8 per cent, a ratio relatively higher than that of food processing (13.3 per cent) and wood and furniture branch (31.2 per cent). Clearly, the import dependence of the textile industry (and other industries such as metals, chemicals and tobacco) in Ethiopia reflects both the limited linkages to the domestic resource base and the weakness of the basic industrial structure.[13]

In 1988, the state-controlled branch of the textile industry contributed 25.1 per cent to total MVA and 42.3 per cent to total permanent work force in the state-controlled manufacturing industry. The textiles and garment manufacturing industry had developed along the lines of import substitution, because domestic demand for textile products exceeded supply (export drives have been, however, intensified since 1985). The Ethiopian textiles industry is handicapped by several factors, the most important include production constraints including lack of modern machinery, unreliable power supplies and delays in arrival of raw materials, and inadequate co-ordination between production and marketing.

Unlike Chad, Liberia and Sierra Leone, the textiles industry in Tanzania is mainly based on the utilization of locally grown cotton and sisal. Unfavourable textile pricing policies in Liberia and Sierra Leone, for example, favours the import of and trade in textile products, including the so-called Java prints. This implies that Liberian textile industries are not competitive in the West African sub-region. A feature of the Liberian (Monrovia) retail activity is the sale of Java prints imported partially from Ghana and the Ivory Coast.

3.4. Fertilizer Industry

Another important relationship between manufacturing and agriculture is explained by fertilizer use in agriculture (in the ISIC fertilizer is a component of the chemicals branch). It is one of the most important inputs in agricultural production in the LDCs.

Many LDCs are heavily import dependent as far as the supply of fertilizers is concerned. Fertilizers have often been made available through aid-financed programmes, a case in point being fertilizers in Bangladesh. Ethiopia lacks suitable raw material inputs for the manufacture of

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[13] Op. cit., UNIDO, PPD.185, 21 February 1991, p. 49.

fertilizers, there are no local production facilities and as a result all fertilizers have to be imported. Levels of fertilizer application in Ethiopia is believed to be among the lowest in the LDCs, amounting to 66 grammes per hectare of arable land (in 1986). Where available, fertilizer plants have been limited to mixing and formulating of imported products. Mozambique, for example, is endowed with adequate facilities and natural resources such as raw salt, natural gas, natural phosphate rocks and electric energy for producing fertilizers and other chemicals needed in agriculture. There is the need to rehabilitate the country's fertilizer mixing and formulating plants and diversify its products using the available local resources.

The availability of fertilizer through foreign aid-financed programmes has reduced the pressure on LDCs to increase production using local raw materials. Besides, the low purchasing power of peasant farmers resulting from poor crop production and low prices of agricultural goods paid by state-owned marketing boards restricts the growth of effective demand for fertilizers and other manufactured goods. One can expect that the increase in farm income would depend on increase in fertilizer application rates.

Tanzania produced 10,000 million tonnes of nitrogen, phosphate and potash fertilizers in 1986 to supply 25 per cent of local consumption.[14] Production is based on imported ammonia, sulphur and potash, but phosphate and natural gas for the production of ammonia are locally derived. When the ammonia-urea complex at Kilwa Masosko with an expected capacity of 3330,000 million tonnes of nitrogen -derived ammonia, and 250,000 million tonnes of nitrogen -derived urea is activated,[15] some significant linkage between industry and agriculture and mining would be established in Tanzania and probably in the PTA sub-region.

The fertilizer industry in Tanzania and other LDCs cannot develop rapidly without a parallel development of the agricultural sector with which it maintains strong forward linkages. In Sub-Saharan LDCs, fertilizer is required to increase the production of export cash crops, and in Tanzania and other Asian LDCs to increase cereal production badly needed for local consumption.

Obviously, the development of the fertilizer industry would require a parallel development of the transportation infrastructure, distribution and marketing systems and the packaging industry. For the transportation of bulk of fertilizer to remote agricultural areas, paper bags, natural fiber bags derived from jute or sisal and synthetic material or polyethylene bags are needed. Should the gap between fertilizer production and consumption be closed by increased production within the LDCs, then the packaging industry should be expanded to meet future increases in fertilizer demand.

3.5. Metal products and engineering industry

Although the metal products and engineering branch's contribution to output in LDCs is relatively small, it plays an important role within their economies. It can be termed as the pivot of industrialization and a "core" industrial sub-sector. Capital and intermediate goods produced could enable

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[14] FAO Yearbook, Fertilizer, 1988.

[15] UNIDO, Industrial development strategies for fertilizers industrial systems in Africa, PPD.170, 14 July 1990, pp 7-10

the branch to establish strong linkages with the agricultural and construction sectors as well as with industry.

The output of metal products in Ethiopia include structural steel and other products for the construction industry, simple hand tools, bottle tops and cans, and household utensils. There are no iron ore reduction facilities and the bulk of the basic metals input used in the branch are ore and scrap iron imported.

The production of simple hand tools at two Ethiopian factories is the main linkage between the metal working branch and the agricultural sector. The Ethiopian Metal Tools Factory was established in 1969 to produce 500 tonnes of hand tools per annum including spades, shovels, axes, machetes, rakes, and spike harrows for the agriculture sector. With a capacity of 400,000 sickles per year, the second enterprise, the Ethiosider Iron and Steel Factory built in 1971 in Asmara, was to channel its products into agriculture. Both plants face severe existential problems. Due to poor quality of their products, these plants suffer from competition with imported tools. Poor transport and marketing facilities also cause slump in production. A rehabilitation and expansion project to increase output to 12 million hand tools per annum at the Ethiopian Metal Tools Factory is being planned. Also, plans are afoot to establish at Nazareth the Agricultural Implements Factory to produce 79,000 animal-drawn and 2,125 tractor-drawn implements (ploughs and hoes) and 600 tonnes of spare parts per annum. A tractor assembly plant at Nazareth completed in 1984 was initially conceived to produce tractors and later, diversify production to include combine harvesters, trailers and spare parts. Production fell from 833 to 100 tractors respectively in 1986 and 1988, also production has not yet been diversified. High production cost of tractors due to expensive imported parts and marketing difficulties are major problems confronting the tractor plant.[16]

Ethiopia's engineering capacity is still limited to maintenance and repair workshops. These are generally inadequately equipped and staffed. It is estimated that more than half of the country's tractors are out of operation at any one time due to inadequate maintenance and repair services. There is the need to establish a central maintenance and engineering workshop which would service and provide training for staff from the public service corporations. Also, the small-scale private sector engineering workshops when promoted would generate sub-contracting arrangements for the production of spare-parts and machinery required by the public metal and engineering enterprises.

The metal products sub-sector has contributed between 7 to 14 per cent of manufacturing output in Somalia. The Government owned Foundry and Mechanical Workshop (FMW) and an aluminium utensils plant in Mogadishu are the two recognized metal products factories in Somalia. The FMW is the only enterprise of its kind in Somalia which has some capacity to manufacture agricultural tools and implements including animal-drawn implements, maize grinders, hoes, spades and rakes. Although the plant depends heavily on imported metals, small savings are achieved through the use of local scrap iron. The FMW is facing major problems resulting from utilization of inexperienced and untrained work force, poor quality of finished products, poor maintenance of machines and lack of spare parts. Despite the fact that

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[16] Op. cit., UNIDO, PPD.185, 21 February 1991, pp. 84-89.

the plant has to be rehabilitated, the plant from national point of view appears to be beneficial to the Somalian economy.[17]

The role of the artisanal metal working sector in the metal products industry in many LDCs including Mauritania is notable. Traditional blacksmiths still produce using mainly scrap agricultural tools used in the rural areas in Mauritania. A survey indicated that local artisanal co-operatives, including 68 blacksmiths in the town of Nema, for example, manufactured a wide range of agricultural and household tools.[18] It was estimated that the total number of blacksmiths in Mauritania is 6,000, and in urban areas this informal sector is incorporated into the modern sector. Most of the informal metal sector carry out repair services on modern household and transport machinery. In almost every urban agglomeration of the LDCs, this informal sector is found located usually on the urban periphery.

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[17] Op. cit., UNIDO, PPD 91, October 1988

[18] UNIDO, Rapport final du project de development de l'artisanat utilitare au Gouvernement de la Republique Islamique de Mauritanie, October 1987, p 24

4. MANUFACTURING LINKAGES TO MINING

In general, manufacturing linkages to the mining and quarrying sector in the LDCs are weak. The main reasons are that mining today, requires highly specialized equipment and other inputs which generally, are not feasible to produce in any LDC (or in most of the developing countries in general for that matter). In LDCs capital and intermediate goods input used in the mining is thus, small, and mining's input into manufacturing is low. An exception is the mining of a range of non-metallic minerals such as limestone, clay stone, sand and aggregates which are consumed almost exclusively by the local industry (especially in the building materials sector). The mining of such minerals is very closely linked to the user industries and as a group they constitute a valuable raw material base for most LDCs. Almost none of the other minerals extracted are beneficiated, but exported as raw commodities. When beneficiated, extracted mineral resources could forge important linkages to industry.

As shown in Appendix table 2, the mining and quarrying sector of Guinea and Mauritania contributed sizeable share to GDP. The share of the Guinean mining sector to GDP was 22 per cent in 1988 and 95 per cent to total export revenue. Bauxite and alumina forms the backbone of the Guinean economy, they contribute more than 90 per cent of the export revenue.

Due to the recent diversification policy in the mining industry, whereby the exploitation and development of other mineral resources were encouraged, the sales of bauxite and alumina made up only about 74 per cent. Guinea processes locally extracted bauxite into alumina. Under the European Community Mining Aid programme (SYSMIN), the Friguia's alumina plant is to receive about $51.5 million to upgrade the plant which is expected to restore alumina production from 600,000 to 670,000 tonnes per year by the end of 1993.[19] When Guinea's aluminium smelting plant project (with Soviet financial and technical assistance) is through, Guinea's metal industry should be expected to strengthen its backward linkages to the mining sector and forward linkages to construction and industry as a whole.

Iron ore continues to be Mauritania's principal mineral and export commodity. In 1988, production and exports were 10 million tonnes valued at $144 million. Mining of the ore is focussed on the Kedia d'Idjill, Rhein and the Oumm Arwagen deposits. A beneficiating plant at the Rhein mine employs a dry enrichment process involving magnetic separation. Planned output was 1.2 million tonnes, but the beneficiating plant is under-utilized. A loan of about $70 million from the African Development Fund, the Arab Fund for Economic and Social Development, etc., is to help improve rail line and port facilities, modify plant and process technology and plant maintenance.

Industrial development in the atoll countries namely, Maldives, Comoros, Western Samoa, Kiribati and Vanuatu is hampered not only by the problems of distance, lack of economies of scale, distance to sources of supply and market, access to technology, small market, skills etc., but also by the dearth of essential factors of production such as raw materials including mineral resources.[20] Development and utilization of marine resources could be a key to industrialization. But while exploiting the marine resources ,

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[19] West Africa Minerals Yearbook 1988, pp. 207-209.

[20] Pollard, S., Pacific Atoll Economies, in Asian-Pacific Economic Literature, vol. 3, No. 1, March 1989, pp. 75-76

protective measures should be taken to safeguard against destruction of the marine habitat and the ecological systems, especially in the heavily populated island countries. In the Maldives coral and shells are used in the handicrafts industry. In Vanuatu manganese is mined spasmodically and pozzolana (volcanic ash used *inter alia* in cement production) are known to exist.[21] Analysis of a pilot project in Kiribati tends to suggest that favourable climatic conditions on the island is conducive to the development of solar saline of international quality, the use of which is needed in household consumption as well as in food processing and chemicals industry.[22]

On the whole, mineral resources in most LDCs lie unexploited and their extent unexplored. Mining sector linkages to manufacturing are very weak. When developed, the mining sector may provide the foundation for the "core" industries such as metal, engineering, building materials and chemicals which form the basis of modern industrialization. The greatest development potential is seen in the area of non-metallic minerals which represent a wide range of raw materials with a rapidly growing range of industrial applications offering significant opportunities not only for import substitution but also in several cases for export after beneficiation.

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[21] UNIDO, Industrial Development Review Series, Pacific Island States: Selected Countries, UNIDO/IS 645, 21 July 1986, p. 161.

[22] UNIDO, Assistance to Solar Salt Industry, Kiribati, DP/ID/SER.B/66, 28 December 1989.

5. MANUFACTURING LINKAGES TO CONSTRUCTION

In most LDCs, the building and construction sector is totally dominated by the private sector (local and foreign enterprises) which, however, depend largely on government contracts. Construction activities are mostly government and infrastructural works and housing projects (public and private). The shortage of housing facilities for the urban and rural population is a problem facing many LDCs. The weak linkages between manufacturing and the construction sector makes many avowed programmes to house the poor, especially those in the rural areas, almost impossible. However, introduction of simple technologies using local raw materials and small-scale, labour-intensive production methods permits a closer integration of materials production with the construction process and has been promoted successfully in some LDCs.

Roofing of houses is still a problem in Nepal (as in many other countries) and corrugated iron sheets has to be imported at enormous costs, although locally produced tiles using domestic raw materials is an alternative of acceptable quality and price. Similarly, much construction in LDCs still depend on wall materials incorporating significant amounts of imported cement due to the difficulty of gaining popular acceptance of low-cost blocks or bricks with more modest or new foreign inputs.

Although it accounts only for about 7.6 per cent to GDP in 1988, the building and construction sector in Lesotho can be expected to perform better and establish functional linkages to manufacturing over the next decade. Lesotho has large reserves of sands, dolorite and basalt used in the manufacture of aggregates required in the construction of public buildings and housing.

An important manufactured input for the building and construction sector is cement (it is also used in the manufacture of cement blocks, tiles and pipes etc.). Other products for construction include aggregates, galvanized wire, steel products etc. Cement is by far the most important construction material manufactured in Ethiopia, accounting for 66 per cent of the gross value of production within the construction branch, and 61 per cent of the value added in 1985/86. There are four cement plants in operation, the largest in Addis Ababa has a nominal capacity of 70,000 tonnes per annum. Government privatization policy which allowed private construction, ownership, sale and rentals of houses and offices in March 1990 has stimulated the demand for cement and other construction materials. There is, therefore, the need to rehabilitate the cement factories to expand capacity to meet increasing demand. The state manages seven factories manufacturing cement blocks, tiles and pipes in Addis Ababa. They supply construction material inputs for the public housing construction programme. Besides the public units, 22 small-scale private-sector enterprises produce and market fire clay bricks mainly to the private building contractors.[23]

The demand for cement by the construction sector in Mozambique is also quite large. At the moment, cement is imported, thus draining the available scarce foreign exchange resources. With the development of railways and other supportive infrastructure, the existing three cement plants could utilize the huge local limestone deposits to produce about 500,000 tonnes of cement per year to meet both domestic and foreign demands.[24]

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[23] Op. cit., UNIDO, PPD.185, 21 February 1991, pp. 81-82

[24] Op. cit., IPPIS/399, February 1991, p. 13

The development of the metal and engineering and non-metallic sub-sectors of manufacturing would generate effective forward linkages to the construction sector in the LDCs. The development of the above depends also on the mining sector.

While effective linkages between manufacturing and the construction sector is essential to development in the LDCs, the former's linkages to the services sector should also be perceived and analyzed. The positive relationship between the services sector and manufacturing in the LDCs has already been empirically established.

6. MANUFACTURING LINKAGES TO SERVICES

Growth in the services sector of the GDP of LDCs as shown in figure 1 is encouraging. The lowest average annual growth of -2.8 per cent during the period 1985 and 1988 occurred in Djibouti, and the highest of about 19.0 per cent in the Maldives (the Maldevian economy depends mostly on tourism). Interestingly enough, the Maldives again and concurrently, registered the second highest growth in manufacturing during the same time period.

A thorough analysis of the manufacturing services sector relationship must, however, await the refinement of the existing crude service sector data. Data on sub-sectoral output and consumption figures for services in LDCs is lacking (data in the national income statistics is scratchy), making even an empirical assessment of the relative importance of manufacturing inputs into services or sectoral domestic consumption figures difficult. To help make socio-economic analysis and sound development strategies possible, the development of proper statistical data systems could be essential.

Due to the paucity of data, one is not able to use an effective and an up-to-date input-output data to measure the manufacturing services linkages. One can hardly measure and compare the inter-sectoral and intra-sectoral dependency ratios between manufacturing and the service activities (the ratio measures a sector's purchase of an input expressed as a percentage of its total intermediate input purchases), the multiplier effects of manufacturing which result from manufacturing propensity to generate indirect linkages for output and employment expansion in the services and other sectors of LDCs' economy.

The above-mentioned problems of analysis should not, however, prevent any fruitful discussion of the industry-service relationship in the LDCs.

The indirect linkages between industry and services, with respect to the possible and potential industry induce-demand for services, as well as industry's backward linkages to services in the LDCs need discussion in the coming paragraphs. This theme is relevant to industrialization and development in the LDCs. But before one begins with any discussion of the themes, one has to define and clarify the services terminology.

Services may be termed as a group of marketed (comprising producer, distributive and personal services) and non-marketed activities (social services). The former which receives particular emphasis in this paper may include finance, banking, credit, insurance, repairs and maintenance, skill management and training, accountancy, engineering design and consultancy and R&D services for manufacturing, wholesale, retail trade and tourism. The later services category include health, education, welfare, public administration, legal services etc.

A forgotten and sometimes neglected facet of the services sector in the LDCs are the growing informal sector. Unlike the other sectors, the nature of their economic organization is not strictly commercial. Credit unions, associations, traditional and cultural groupings are some important informal services. Their linkages to manufacturing, and their socio-economic roles in the development process in the LDCs are unfortunately underestimated or neglected. Traditional credit institutions and associations provide significant financial, entrepreneurial and management skill and training to manufacturing industry in almost all LDCs where financial and skilled labour are in short supply. A typical informal service linkages with manufacturing

involves small service units which collect, clean and resell used glass bottles to the bottling and beverage industry.

Due to lack of data, the forward linkages of manufacturing to services in the LDCs can only be tentatively described. It could be expected that finance and insurance services would, in general, use manufactured inputs such as office appliances and items including furniture, paper, ink, electrical equipments etc. Also, the main manufactured items going into distribution, hotels and restaurants would be processed food and drink. However, it is likely that the import content of such inputs in many LDCs is quite high.

Industry in the LDCs require considerable inputs from specialized financial, legal, and professional services to facilitate their operations. Innovations from the services sector such as the use of communication systems etc., could facilitate changes in the organization of industry.

The range of financial services on offer to industry is limited and very scarce in almost all LDCs. Forward linkages from banking and financial services are likely to be strong in manufacturing when liberalized and market-oriented financial systems are efficiently promoted.[25] UNCTAD has noted that insurance services provided by domestic companies to manufacturing in the LDCs are relatively low in quality.[26] (Flexible laws relating to the admission of private and foreign firms, in Rwanda, for example, may help reduce laying off risks in production and transportation bottlenecks, thus facilitating the flow of goods and services into manufacturing).

The importance of engineering design and consultancy services (EDC) has been recognized by all LDCs which have entered the phase of industrialization. The role of EDC seems particularly important as the overall industrial infrastructure presents a number of constraints in critical areas such as project formulation and design expertise, technological base, availability of skills, lack of industrial experience, and paucity of technological and commercial data and information.

The development of local EDC services may present a set of benefits for LDC industry and economy. These include the following[27]: (a) more appropriate choice of technology; (b) more efficient acquisition of technology; (c) adaptation of imported technology to local requirements and needs; (d) maximum use of indigenous equipment, materials and skills; (e) attainment of technical self-reliance; (f) learning experience through doing; (g) increased innovation capability; (h) linkage to R&D institutions; (i) increased exports through maximum use of EDC services and; (j) development of local industry through EDC services.

Local consulting firms can act as catalytic agents to provide necessary information on the areas of technology needs to local, regional and other R&D institutions to help create technologies of specific interest to LDCs. Such technologies can be channeled into manufacturing and other productive sectors of the economy. LDCs can achieve improved technical competence and reduce

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[25] OECD, Trade and services in developing countries, Paris, 1989.

[26] UNCTAD, Insurance in the context of services and the development process, TD/B/1014, August 1984.

[27] UNIDO, Strengthening Engineering Design and Consultancy Services in Developing Countries, IPCT.103(SPEC.), 27 December 1989 pp. 18-47.

vulnerability in technology, equipment and turnkey project purchases when local consulting capability is increased.

By developing specifications and tender drawings for equipment relating to local industries, local consultants can contribute immensely to the development and growth of indigenous industries.

The role of the LDC governments as major users and makers of policies which affect the growth and use of EDC is important. In Ethiopia, for example, the government acts as an entrepreneur and initiates industrial, transport and communication and public utility projects (mostly state-owned) which demand EDC services.
In a number of LDCs the government has set up a public sector EDC organizations as corporate bodies. The development of public EDC corporations should not hinder private EDC services enterprises when policies are made to ensure open competitive market system. Such a system will ultimately promote efficiency in EDC services system.

For the development of EDC services, LDC government may adopt the following strategies: (a) associate local consultants with foreign consultants so as to encourage the transfer of knowledge and skills; (b) support through full or partial funding, training programmes for consultants of local EDC services firms; (c) provide a package of incentives to local consultants including tax relief, development rebate etc. with the aim of accelerating their growth; (d) make available easier bank credits to local EDC firms for their working capital requirements and; (e) develop a long-term plan for the EDC service capabilities, with the assistance from local EDC organizations UNIDO.

Where the level of manufacturing activity is low, the services sector when promoted would induce a conducive environment for manufacturing and other sectors of the economy. On the basis of their local and natural endowments, insular LDCs may even find it realistic to promote the development of the services sector including that of infrastructural and producer services. Moreover, where the chances of increasing export earnings from agriculture and manufacturing are limited, the possibilities for increasing earnings through the export of services may be lucrative.

With the beginning of direct flights from Europe to the Maldives in 1981, the tourist industry witnessed a spectacular rise (1981/82) to coincide with the decline in the fishing industry. Tourism contributes a 14 per cent share to GDP (1984). Expenditure in the industry increased from $9.4 to $25.3 million in that same year. All these tend to indicate strong multiplier effects throughout the Maldivian economy, particularly on the construction and the services sector. Furthermore, tourism- related jobs have had a beneficial impact on development skills in the hotel and catering trades, as well as in the construction and engineering sectors. Wages in the sector are higher than those in fishing and agriculture, but it appears the tourist industry had only a small impact on the disguised unemployment and poverty of the Maldives.[28]

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[28] op. cit., Pollard, S., 1989, p. 72.

6.1. Employment generation implications of manufacturing services linkages

The preceding paragraphs will attempt to analyze the employment structure of manufacturing industry and services, their relationships and implications for development in the LDCs.

A characteristic of the LDCs has been the ominous failure of industrialization to create enough employment to absorb the growing urban population largely due to rural-urban migration and population growth in countries such as Bangladesh, Burundi and Rwanda. The recent Import Substitution Industrialization (ISI) policy in LDCs experienced mixed success.[29] A result was that industry could not open jobs to cater for population growth. In order to solve this problem, policy-makers as well as scholars have called for a labour-intensive pattern of industrialization featuring "appropriate" technologies.

Neither a labour-intensive nor a capital-intensive pattern of industrialization can a priori be advanced as a policy prescription for the LDCs. A policy prescription should be country-specific an be based on economic criteria.[30]

The role of industry in employment generation in the LDCs can be identified not only through its direct effects, but also through its indirect effects and extensive linkages with the services sector. It can be argued that the provision of productive employment would increase per capita income and stimulate the demand for services in the LDCs.

Appendix table 3 shows the share of labour force and share to GDP for the industry (industry means total industry, manufacturing forms a relatively greater sub-sector), services and agriculture sectors, and the average annual growth rate of labour force for selected 30 LDCs between 1960 and 1983. A comparism of the three time periods 1963-1973, 1973-1983 and 1980-1990 shows a general increasing average annual growth of labour force in the selected LDCs. Laos made a notable 30 per cent gain in its labour force potentials. The growth rate throughout the three time periods were 0.6 , 0.9 and a sudden increase of 2 0 per cent growth rate. In contrast to Laos, Somalia recorded a 45 per cent decrease in its labour force, a fall from 3.0 2.0 to 1.7 per cent during the three time periods. While its average annual growth of labour force decreased, Somalia's urban population remained large, about 35 per cent (1988) of total population. On the urban-rural population continuum, Somalia ranked fourth, behind the Central African Republic (45 per cent urban), the Democratic Republic of Yemen (42 per cent urban) and Benin (40 per cent urban). Bhutan, Burundi, Rwanda, Nepal and Bukina Faso are examples of the 30 LDCs with very high rural populations. Population growth in LDCs is one of the important determinants of the nature and type of development strategy to be adopted.

On the sectoral level, agriculture became not only the net loser of employees during the period 1960 and 1981, but also a net loser in shares to

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[29] For reasons of ISI failure see: Hirschman, Albert, O., The political economy of import substituting industrialization in Latin America, in Quarterly Journal of Economics, 1968, pp.1-32; Seer, Werner, and Samuelson, Larry, Toward a service-oriented growth strategy, in World Development, vol. 9, No. 6, 1981, pp. 499-502.

[30] Papanek, G. F., Industrialization strategies in labour-abundant countries, in Asian Development Review, vol. 3, No.1, 1985, pp. 43-53.

the GDP between 1960 and 1983. In Mauritania and the Democratic Republic of Yemen, for example, agricultural employment fell from 91 to 69 per cent in 1960 and 1981, and from 70 to 45 per cent respectively in 1960 and 1981.

There appears to be little scope for employing productively substantial numbers of additional people in the agricultural sector in many LDCs, especially in Bangladesh, where labour productivity is extremely low.

As a result of the general relative fall in agricultural employment, industry and services had to bear the brunt of surplus labour absorption. There exist not only a surplus labour problem in many LDCs, but also disguised unemployment especially in the growing urban centers of countries like Benin, Mauritania, Haiti, the Central African Republic, and Bangladesh.

In order to create a long-term productive employment for the majority of the labour force in the LDCs, an efficient manufacturing industry sector must be promoted, because it is the only sector which is capable of stimulating overall economic growth and thus generating employment opportunities. More people could be employed in the services sector, but only if the productive sector (manufacturing) grows to increase per capita income and stimulate demand for services.

Indeed, growth of employment (and share in GDP) in the services sector seems to be more pronounced than in industry. So far, the growth of the services sector in developed economies is relatively much higher than that in the LDCs. It is indeed assumed that, with the expansion in economic development, the share of service employment in labour force tends to expand while that of manufacturing declines.[31] Whether LDCs would go through the same experience is a question. In any case, there seems to be ample scope for building up the services sector, especially in the industrial support services (sub-contracting, sub-deliveries, R&D etc.). This will likely to stimulate competitiveness and specialization in industrial units.

Morawetz and others[32] listed several factors that cause employment growth in manufacturing to fall behind its own output growth and employment growth in services in the LDCs and in developing countries in general. These causal factors include the following; (1) widespread factor price distortions such as high wage rates in modern manufacturing industries, credit subsidies to investment, over-valued exchange rates and favourable tariff treatment of capital goods imports, all of which contribute to the adoption of capital-intensive techniques of manufacturing production; (2) greater scale of scale economies, factor substitution and technological change which lead to gains in productivity and lower labour-input requirements in manufacturing; and (3) rigid structure of production processes including narrow scope of factor substitution for labour-intensive techniques.

As shown in Appendix table 4, the share of consumer goods such as food products and manufactured goods like clothing and footwear in total household consumption for selected 9 LDCs (1980-1985) exceeded by far that of services such as education and medical care. In Sudan, Bangladesh, Nepal and Mali, food

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[31] Kuznets, S., Modern economic growth: Rate, structure, and spread. New Haven, Yale University Press, 1966.

[32] Morawetz,D .Employment implications of industrialization in developing countries: a survey, in Economic Journal, 84, 1974, pp 491-542.), Baer and Samuelson, (op.cit., and Park, Se-Ha k, Linkages between industry and services and their implications for urban employment generation in developing countries, in Journal of Developmental Economics, 30, 1989, pp. 359-379.

alone contributed more than 50 per cent of total household consumption. In high-income developed economies, however, the share of services in private consumption overtakes that of manufactured goods, thus giving substance to the consumption-income relationship theories which postulate that rising per capita incomes create relatively higher demand for services."[33]

If the income elasticities for most services in the LDCs are sufficiently high, a strategy of increased industrial development would increase per capita income, which would in turn increase the demand for services, thus resulting in the rapid expansion of service employment, and decrease thereby the high unemployment in LDCs.

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[33] Kuznets, S., Modern economic growth of nations, Cambridge, Massachusetts, Harvard University Press, 1971; Sabolo,Y., The services industries, Geneva, International Labour Office, 1975

7. PROSPECTS OF INDUSTRY MULTIPLIER EFFECTS

Industrial activity in the LDCs is expected to generate both direct and indirect linkage effects. The direct employment effect of manufacturing is generally known to be relatively small, but its indirect and income-induce linkages should provide a strong stimulus for the output and employment expansion in the services and other sectors. For example, the personal consumption of the CIMAO cement plant employees in Lome, Togo, who receive wages for the production of cement, creates the demand for several goods and services. Subsequently, the spending of workers who are involved in the production of goods helps in an indefinite income propagation process.

Since input-output tables are not available, it would be difficult to discuss precisely the direct and indirect output multipliers for the economic sectors. It would also not be easy to identify some of the high-linkage industries which may lead to higher rates of growth and hence generate strong demand for services and consequent employment gains in the service sector in the LDCs.

A general feature of manufacturing in the LDCs is the predominance of agro-based industries like food and textile sub-sectors (see table 3). The high performance of these sub-sectors in terms of value added and, perhaps, in employment may suggest their multiplier effect potentials. Light manufacturing industries, for example, food, beverages and tobacco which is prevalent in almost all LDCs, seem to create generally large output multiplier effects, because of their high labour intensity. The multiplier effects of resource-based industries such as chemical products (fertilizers, etc.) and machinery and transport equipment may be small, because of the relatively small domestic capability of producing the capital goods needed by these industries. Most of the transport equipment industries in LDCs are mainly plant units assembling imported parts of cars, railways carriages, bicycles etc. The assemblage of these creates some important multiplier effects and backward linkages to the agriculture sector, the wood and wood products sub-sector etc. Wood and wood products are used as the main domestic inputs for the construction of the "body" or carriage of most transport vehicles (the so-called "mammy" trucks in the Sub-Saharan LDCs).

The "country boat" industry, an entirely indigenized transport equipment sub-sector in Bangladesh also shows a typical multiplier effect of that sub-sector. Country boats are non-mechanized crafts specializing in the carriage of building materials and salt. Materials inputs used in their construction are mainly domestic, including wood, bamboo, scrap iron, jute rope, paper, cowdung, firewood and cloth. A large number of craftsmen are employed in the boat-making: they include woodcutters, bamboo net makers, producers of hardware, blacksmiths and rope-makers. Another important feature of this industry is the very substantial employment effect of investment in this branch in the Pabna, Dhaka, Mymensingh and Comilla areas. Country boats are believed to generate 12 times as much employment per tonne-mile per hour as trucks and 20 times as much employment as cargo launches (but wages of both craftsmen and boat's crew members remain very low, about half the national per capita income level).[34] The country boat industry maintains a forward linkage with the transport sub-sector, the boats provide the single most important form of transportation as far as the inter-district movement of commodities is concerned. To support and increase the level of linkages between the country boat-making industry and other sectors of Bangladesh's

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[34] Op. cit., UNIDO, PPD.114, 25 April 1989, pp. 49-53

economy, the technical efficiency of the boat building industry should be increased through specific financial and technical assistance (local and foreign). This could help upgrade the technical skills of the boat-makers and increase the competitive stand of the branch in the boat manufacturing industry.

With increased industrialization, the overall multiplier effects and the network of inter-industry linkages would increase, granted that the economies of LDCs are capable of responding to supply bottlenecks.

8. INTERNATIONAL DIMENSION OF LINKAGES

Manufacturing activities in the LDCs relate to the international economic system in two main ways. Firstly, intra-industry linkages may occur beyond national boundaries, and may involve the forward linkages which a manufacturing activity maintains with other manufacturing activities in distant areas or within regional economic groupings. A packaging manufacturing firm, for example, the first beneficiary of the Lome industrial free zone intends to export its metallic packaging products to other manufacturing firms in Benin, Bukina Faso, Mali and Niger.[35]

Secondly, manufacturing- services linkages may either imply intra-LDCs linkages or LDC-international organizations or institution linkages. All these involve the flow of goods, services and innovation. Since the industrialization process in the LDCs is relatively recent and factor scarcities confront it, industrial development may need the necessary inputs and support from the international environment.

8.1. Role of sub-regional economic co-operation in industrial development

It is expected that activities involving the horizontal and vertical integration of production units in industry, agricultural and other economic sectors will contribute substantially to the development of inter-state or inter-regional and inter-sectoral linkages as well as foster interdependence in production enterprises and sectors among LDCs.

Reports from Botswana indicate that the lack of broad foreign markets constitutes much of a problem to manufacturing than capacity under-utilization, lack of foreign exchange, lack of raw materials etc.[36] This complaint points to the fact that the common market which regional economic groupings in the LDCs should provide, has usually tended to be nothing more than separate markets of individual countries. For example, intra-regional trade has been very low among the Southern African Development Co-ordination Conference (SADCC) of which Botswana is a member state. It accounted only for 5 per cent of the total trade of the member countries in 1986.[37]

Both LDCs and non-LDCs are enmeshed in a number of multilateral and bilateral industrial co-operation mechanisms. The most important of these regional and sub-regional economic groupings comprising the LDC and non-LDC member states are shown in Appendix table 5. These are the African, Caribbean and Pacific group of States (ACP), the Preferential Trade Area for Eastern and Southern African States (PTA), the Southern African Development Co-ordination Conference (SADCC), the Indian Ocean Commission (IOC), the Southern African Custom Union Agreement (SACUA), the South Asian Regional Co-operation Council (SARCC) and Economic Community of West African States (ECOWAS).

It can be noticed that Afghanistan, Laos and Myanmar are not members of any of the groupings listed. They seem to exist in some sort of economic isolation. Their case does not mean that all the listed LDCs with membership status in one or more sub-regional economic groupings have been active as far as membership obligations are concerned. More often than not the

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[35] Africa Research Bulletin, vol.27, No.9,November 15 1990, p. 10159.

[36] African Business, December 1990, p.31.

[37] Op. cit., African Business, December, 1990.

harmonization of national and regional economic and political interests have been a problem. Moreover, membership within several sub-regional groupings may be a hindrance, since commitment and concentration would be blurred.

The creation of these organizations reflects not only the political commitment on the part of the member states, but also their intention to integrate development in their respective sub-regions. For example, these organizations are involved in the identification, promotion and finance of projects, skill and management training and exchange of industrial information. Efforts are primarily geared toward the stimulation of joint projects which are essentially resource-based, exchange of raw materials, intermediate products and final goods. To be able to achieve their aims, however, these organizations have to overcome a number of constraints. These include inadequate human and financial means and mechanisms of effecting their programmes. The member states should be able to harmonize the national and regional industrial objectives, policies and strategies so as to foster inter-dependence in industrial development.

Using relevant information available, short details about the objectives, industrial policies, strategies and programmes of the PTA, SADCC, ECOWAS, and to some extent ACP, and their impact on regional and national economic interdependence will be given.

8.1.2. The Preferential Trade Area for Eastern and Southern African States (PTA)

Created in 1982, the 18 member PTA group (Namibia is expected to become a member in the near future) has as its objective: the promotion of economic co-operation among members in the fields of trade, customs, industry, transport and communications, agriculture, natural resources and monetary affairs; with the aim of establishing a sub-regional common market, and eventually, an economic community.

Some of the services facilities for manufacturing have been established by the PTA. These include the creation and promotion of: a clearing house in Harare (Zimbabwe) to enable member states to trade with each other using their own, otherwise non-convertible currencies; a trade and development bank in Bujumbura (Burundi); a Federation of Chamber of Commerce and Industry in Lusaka (Zambia); an Association of Commercial Banks; a Center for Commercial Arbitration and; a system of travellers' cheque to facilitate business travels within the region. Some recent PTA activities in the field of information services have been very encouraging. The first leather trade fair organized in Addis Ababa, Ethiopia in January, 1990 brought home to the industrial and business community the great potential resources available to the leather industry in the sub-region (being an agro-based industry, the development of the leather sub-sector should have positive multiplier effects in both the agricultural and industrial sectors of the economies of the PTA member countries).

Concerning industry, the PTA policy organs have adopted a strategy aimed at establishing a competitive industrial structure to produce consumer as well as capital and intermediate products. This aim is to be achieved by: promoting co-operation in the rationalization/expansion of existing capacities and the creation of new capacities; fostering cross-border, vertically and horizontally integrated production - marketing - distribution systems; and promoting small-, medium- and large-scale production enterprises, as well as multi-national enterprises, especially, in large-scale basic or core industries.

The priority sectors for industry adopted by the PTA are metals, engineering, chemicals, agro-based industries, building materials, human resources and energy. These priority sectors are important, they help generate actual and potential linkages to promote the development of a resilient industrial sector which is capable of meeting domestic and export needs.

The emphasis placed on the food processing industry is a response to supply problems. Regarding building materials, cement is of primary interest for the sub-region. Rehabilitation of the 20 plants in the sub-region would increase capacity large enough to meet the demands of the sub-region. Expansion of glass production would make use of the available local raw materials to provide building and packaging materials.

Actually, the industrial activities of the PTA can be classified as new investment, rehabilitation, expansion and diversification, or institutional development. Examples of projects that meet sub-regional needs include a triple superphosphate plant in Uganda, the production of single superphosphate fertilizer in Burundi, and the multinational sponge iron plants in Ethiopia, Tanzania, Uganda and Mozambique.

The areas of emphasis in the PTA industrial policies include: (a) the development of small- and medium-scale industry to diversify industrial structure or to promote rural employment and contain urbanization; (b) promotion of foreign investment, but this would require suitable "climate" to attract foreign investors; (c) export promotion; (d) rehabilitation, including changes in technologies and product lines, skills upgrading and closer and more links with the rest of the industrial system and; (e) selective import substitution.[38]

As compared to the PTA, the SADCC has yet more to do. The highlight of its tenth anniversary commemoration was "enterprise, skills and productivity".[39] The implementation of this theme to benefit manufacturing is a big challenge.[40]

8.1.3. The South African Development Co-ordination Conference (SADCC)

The formation of SADCC in July 1981 was primarily motivated by the need to promote socio-economic development and economic interdependence (and economic independence from the Republic of South Africa) within the sub-region. Five of the nine SADCC member states are LDCs (Botswana, Lesotho, Mozambique, Tanzania and Malawi; the others include Angola, Namibia and Swaziland). An industrial co-ordination unit located in Dar-es-Salaam (Tanzania) is to speed up the process of industrial co-operation and integration among member states. Industrial development is to cater for the basic needs of the population in the areas of food, clothing, housing, health, water supply, power, transport and education. The special programme of action for SADCC focuses not only on industry, but also on other sectors such as energy, agriculture and natural resources, manpower development, mining, trade, tourism and transport and communication. As much as 16 projects in the

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[38] UNIDO, Revised Integrated Industrial Promotion Programme, PPD.183(SPEC), January 1991, pp.15.

[39] African Business, February, 1990, pp.15-18.

[40] Ibid.

industry and trade sectors with an estimated total cost of US$23.07 million have been earmarked for implementation.

The lack of physical infrastructure (transport, communications, civil aviation and energy) is considered as far greater constraints to intra-regional trade than regulatory and legislative regimes imposing various kinds of controls, foreign exchange shortages, the small size of national markets in terms of either population or purchasing power etc. There is the need to co-ordinate policies to facilitate movement including business travel, increased private business activities, the availability of foreign exchange for the importation of production inputs, cross-border investments etc.

SADCC's industrial development policy and strategy aims include the following: (a) intensification of intra-regional trade (Botswana, Lesotho and Malawi, which have limited domestic markets, could expand exports of agricultural and mineral products); (b) development of indigenous capital and producer goods; (c) increased capacity utilization levels and rehabilitation of viable industrial establishments; (d) adoption of appropriate technology; (e) fostering of labour-intensive small-scale enterprises and; (f) maximization of domestic resources utilization (including managerial, technical and entrepreneurial skills).

A recent economic structure analysis of the SADCC sub-region indicates that the following branches of manufacturing offer the best opportunities for economic interdependence and hence, self-sustained development:[41]

(a) Agro-industries: these industries underscore the resource-based strategy to industrialization. They form important linkages with the agricultural sector. The food processing sub-sector is capable of meeting the food requirements (cardinal basic need) of the people in the sub-region.

(b) Textiles, clothing, leather and footwear industries: co-ordinated projects to produce inputs such as processing chemicals, dyes, spare parts etc., would find ready markets in the region.

(c) Forestry-based industries: they should create linkages with the mining, transport (railways) and building and construction sectors, and other manufacturing sub-sectors, including furniture and fixtures. There is scope for regional import substitution in the pulp, paper, printing and publishing branches.

(d) Chemical industries: chemical products are used as intermediate products by many industries. The region is endowed with raw materials for these products. Utilization of the raw materials would expand the capacities of existing or new plants in the fertilizers, paints, pesticides, petrochemicals and the pharmaceuticals branches.

(e) Non-metallic minerals industries: their strong backward linkages with the mining and quarrying sector and forward linkages with the building and construction sector is well-known. The regional market for cement, lime, clay bricks, sheet glass, porcelain and electricity is large.

(f) Metallurgical industries: these should have close linkages with the mining sector and other branches of manufacturing industry. They are the source of capital and intermediate goods industry, but their development

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[41] Op. cit., UNIDO, PPD.183(SPEC.), 16 January 1991, pp. 21-30.

require substantial investment and modern technology and regional co-ordination.

(g) Engineering industries: their development (that is mechanical, electrical and electronic industries) should produce the main equipment and machine tools used as capital and intermediate goods inputs by the key sectors such as agriculture, construction, mining, and transport and communication. Since their development entails high capital investments and technological and technical costs, intensive co-ordination is needed in their development.

Effective regional coordination of the above key industrial branches and their sub-sectors should make a significant contribution towards self-sustained industrial development in the SADCC region. The sub-sectors should offer great potential for upstream and downstream linkages with other sectors at both national and regional levels.

8.1.4. The Economic Community of West African States (ECOWAS)

The growth of regional markets could also play an important role in the future development of the West African, Asian and Pacific and Caribbean (Haiti) LDCs, since the domestic markets of most of these countries are too small for strong expansion of the manufacturing sector.

Established in 1975, ECOWAS has as its main objective the creation of a customs union and, later a common market among the member states (12 of the 16 member states are LDCs: the others are Côte d'Ivoire, Ghana, Nigeria and Senegal). The intention is to increase intra-regional trade and reduce the members' relative volumes of trade with the industrialized countries.

The ECOWAS treaty provides for harmonization of policies among member countries in a number of sectors including agriculture, industry, transport and communications.

A timetable for liberalizing trade in industrial products has been in operation since May 1981 (it requires that more developed ECOWAS member states eliminate trade barriers imposed on goods originating from other ECOWAS member states more quickly than the less developed members). A number of 25 industrial products are to be freely traded among member states. These include biscuits and beer (food products), billets and laminated steel, burnt lime, brake pads, tiles, intermediate plastic products, electric lamps, rope fibre, iron wire cable, wire netting, barbed wire and paper sacks. In principle, these products should have a 60 per cent local raw material content so as to create intra-industry and inter-sectoral linkages, 51 per cent ownership by citizens of member states and 40 per cent of value added.[42]

Like other regional integration organizations, especially in developing countries, ECOWAS' operations are hampered by the fact that member states tend to produce competing goods in the primary sector which reduces intra-regional trade possibilities. Other constraints include simultaneous membership by member countries in a number of regional schemes and the large number of currencies which complicate transactions in the sub-region.

Unlike the other regional co-operation bodies, the ACP has the largest membership coverage, including all the African LDCs, Haiti and the Pacific

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[42] African Economic Digest, 19 February 1990, p. 9.

island states, excluding the Maldives. Since its establishment in June 1975, the ACP has been severally transformed. Several conventions including the Yaoundé Convention associated some African member states with the European Economic Community (EEC) (these associated member states have some access to the EEC market). The main aim of the ACP is to develop greater and closer co-operation in trade and exchange of information concerning trade, technology, industry and human resources. Compared to the above sub-regional organizations, the ACP appears to offer limited opportunities for economic interdependence within the LDCs. This is partly due to large size and co-ordination problems within the organization.

8.2. Role of international organizations and technical co-operation

Where governmental resources for the promotion of industry is limited, international organizations and other institutions such as the United Nations Industrial Development Organization (UNIDO), the United Nations Development Programme (UNDP), the European Economic Commission (EEC) etc., give significant services assistance, thereby establishing important linkages between manufacturing (and other economic sectors) and the international system. These linkages involve the flow of the following into industry: industrial credit and finance, consultancy, research and development, and industrial extension services including management and skill training, quality control and standardization in manufacturing (to ensure competitive stand on the world market), accounting and engineering services.

8.2.1. UNIDO's assistance

UNIDO's assistance to the promotion and development of industry in the LDCs has been on the country- and regional-level basis.[43]

UNIDO contributed variously to the Second United Nations Conference on the Least Developed Countries convened in Paris[44] in 1990 to review progress made in implementing the Substantial New Programme of Action for the 1980s for the Least Developed Countries (SNPA) adopted at the first United Nations conference on the subject in 1981.[45] Besides an updated review of the manufacturing sector of the LDCs prepared as a contribution to the second Paris conference, UNIDO also presented a document on industrial development in the African LDCs, containing proposals for priority action in relation to the Industrial Development Decade for Africa presented at the ninth Conference of African Ministers of Industry.

As a follow-up to the Paris Conference of 1990 which adopted a Programme of Action to accelerate the development process in the LDCs during the 1990s, UNIDO is preparing a project which is financed by the Italian government to prepare an industrial development action plan for the LDCs. The finalized industrial plan would be submitted to the fourth session of UNIDOs General Conference in November.

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[43] See UNIDO, Annual Report of 1989, Industrial Development Board, Sixth Session, 1990, pp. 69-71; and UNIDO, Annual Report of 1990, Eighth Session, 1991, p. 65.

[44] United Nations, Second United Nations Conference on the Least Developed Countries, A/CONF.147/Misc.9, GE.90-52264/2411B.

[45] United Nations, Report by the United Nations Conference on the Least Developed Countries, Paris, 1-4 September 1981, United Nations Publication, Sales No. E.82.I.8.

Regarding operational activities, UNIDO fielded missions to 30 LDCs, and increased also the quality and quantity of technical assistance to industry in the LDCs. New approvals of technical assistance for industry in the LDCs in 1990 amounted to $16.68 million (1989: $15.05 million) of total technical assistance given by UNIDO representing 126 projects mainly in such priority areas as development of industrial services, human resource development, rural development, and industrial promotion and investment. Out of the 42 LDCs, a total of 34 countries benefitted from the UNIDO's technical co-operation in 1990. Net approvals of technical assistance amounted to $26.35 million (1989: $21.12 million), that is 16.52 per cent of UNIDOs technical assistance while delivery reached a level of $22.05 million (1989: $22.34 million).

Numerous country, regional and sub-regional projects were carried out in 1989. For example, promotional activities relating to industrial investment were carried out in Nepal and Bangladesh, Haiti and LDCs in the South Pacific. In Tanzania, a diagnostic survey for the rehabilitation needs of selected agro-based industries was also carried out with the intention of promoting and strengthening intra-industrial as well as inter-sectoral linkages.

A seed programme supported by the government of Japan was initiated in 1990 to promote the traditional textile industry, a sector that has great linkage and economic potentials in the African LDCs. A regional workshop on the development of the agro-related metalworking sector was carried out for the LDCs within the framework of the Special Programme for the Industrial Development of Asia and the Pacific.

UNIDO observes that the lack of technology alone does not hinder industrialization in the LDCs. The availability of skilled work force to use efficiently available technology is conceived to be a prerequisite for industrialization. Since 1979, UNIDO has rendered technical assistance to developing countries including LDCs. It considers metal-processing and metal-fabricating skills and technologies as crucial for industrialization. It therefore measures, keeps inventory and disseminates information on technology capability and industrial skill relating to 140 selected engineering products. Table 4 shows the skill-intensiveness of selected LDCs for 1970 and 1987.

The problems of the LDCs lie in the fact that some have small or no engineering industry to provide the training ground for the basic metal-fabricating skills needed. Where these training opportunities are existent, they belong to the informal manufacturing sector, for example, in the scrap dealers foundries in Dhaka (Bangladesh), Monrovia (Liberia), and Kabul (Afghanistan), etc. In 1987, some 18 LDCs managed in their own way, to convert and transform metals with traditional methods, that is without the use of specialized machine tools.[46] Myanmar, Tanzania, Mozambique and Bangladesh are some LDCs which made significant progress in technological change in the effort to attain economic development.

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[46] UNIDO, Industry and Development Global Report 1990/91, UNIDO Publication, Sales No.:E.90.III.E.12, 1990, pp.30-36.

Table 3. Technological capability and industrial skills in selected LDCs, 1970 - 1987

Rank in 1987	Country	1987	1970
1	Myanmar	1470	1028
2	Tanzania	812	478
3	Mozambique	639	461
4	Bangladesh	498	58
5	Central African Republic	315	192
6	Sudan	238	198
7	Yemen, Dem. Rep. of	229	-
8	Mali	177	-
9	Burkina Faso	137	137
10	Togo	137	-
11	Rwanda	96	54
12	Malawi	54	54
13	Chad	54	-
14	Ethiopia	42	42
15	Sierra Leone	42	42
16	Haiti	42	-
17	Yemen, Arab. Rep. of	42	-
18	Nepal	40	-
	Yugoslavia	9120	7861
	India	4566	2814
	China	3114	611
	Egypt	2116	1454

Source: UNIDO, Industry and Development Global Report 1990/91, UNIDO publication, Sales no.,: E.90.III.E.12, 1990, p.3.

Note: "-" represents missing data.

9. SUMMARY, PROPOSALS AND POLICY IMPLICATIONS

9.1. Summary

The knowledge about the strength and extent of economic linkages is very essential for any socio-economic policy and strategy. Linkages should evolve in the process of enhancing industrial efficiency and should not be created for their own sake.

The linkages between manufacturing and other sectors of the economies of LDCs have not been adequately considered. Instead, analysis of the growth and potentials of economic sectors have been separately made and single-sector growth strategies have been formulated.

Generally, the range of manufacturing having close linkages with other economic sectors of LDCs is relatively low (food processing, textiles, leather all agro-based industries do have exceptional strong linkages, especially to manufacturing). This is mainly due to the fact that LDCs are recent participants in the industrialization process and also that many problems confront progress.

On the whole, inter-sectoral linkages may seem to be more developed than inter-industry ones. Empirical evidence tends to suggest that manufacturing industry has a relatively strong and potential linkage with the services sector in the LDCs.

Manufacturing in LDCs cannot be isolated from the external and international environment. Intra-LDCs regional co-operation and co-operation between LDCs and international bodies and institutions are relevant for the creation of effective linkages for industrial and socio-economic development.

In the past, many LDCs and developing countries in general have failed to utilize potential linkage effects. For example, investment projects have failed to generate the expected income effects, because such projects have became "white" elephants. Projects executed by multinational and bilateral agencies in LDCs are not effectively integrated in the long-term development plans of LDCs. Generally, they have failed to stimulate manufacturing. Most of the manufactured products used were imported. Thus domestic sourcing and linkage potentials were not utilized.

How to promote economic linkages and interdependency within and among LDCs constitute therefore, the main issue of this paper.

9.2. Proposals and policy implications

Deriving from the above, it can be concluded that there is ample potentials for economic linkages in the LDCs. Proposals will, therefore, be advanced with the view of developing and strengthening economic linkages for development, these include the following:

(1) **Development of a viable industrial and national accounts data base.** This proposal relates to the rather poor state of data and information on manufacturing industry and economic sectors in LDCs. There is an urgent need to develop at country- and international organizational-levels a viable data

base.[47] UNIDO and other UN and international bodies could help by giving financial and technical assistance to government statistical bureaus and agencies of LDCs to develop and manage national accounts and industry-based statistics. Mechanisms need to be instituted not only to channel in due time data amassed to UNIDO and other United Nations, but also to enable effective data bank and information liaison. To help governments of LDCs develop good quality data and information, the perception of industry as an important factor of development should be promoted. Enterprises will then come to know the use of information in planning. The availability of viable data will, for example, help in the compilation of an input-output data for intra-industry and inter-sectoral linkage analysis. Similarly, the formulation of an effective industrial policy would require viable data. Certainly, one has to identify the structure of basic needs, the resource contents or implications of the needs (such as food, clothing, housing, health care and other primary services) and the scope of adjusting the mass needs and existing consumption profiles to the resource endowments of the country in question.

(2) **A rapid industrialization policy based on utilization of local raw materials and products.** This is capable of generating effective linkages between manufacturing and other economic sectors. Manufacturing enterprises which use local raw material and services and have potential linkages to other sectors of the economy need additional incentives such as custom duty benefits in the import of relevant inputs used in production, income tax benefits etc., Timely assessment of the incentives may be needed to ensure that profitable enterprises benefit.

(3) **Development of cottage and small industries and strengthening of the links between small- and large-scale enterprises** are essential in order to increase the domestic production of intermediate and capital goods. Cottage and small industries are capable of creating gainful employment, thus raising incomes to create the demand for manufactured goods. They require low capital good inputs, produce goods and services to meet basic needs and use local raw materials and consequently provide opportunities for linkages between manufacturing and agriculture, services etc.

(4) **Stimulation of manufacturing and economy by the creation of a more favourable climate to private investment.** This needs to include encouragement of private foreign investment as a means of acquiring the necessary capital, entrepreneurship and technical skills not available.

(5) **Liberalization** to include favourable exchange control policies, limited price controls and trade policies to encourage inter-country and inter-regional flow of goods and services. Enterprises need to be provided assistance instead of being provided protection from outside competition.

(6) **Technical assistance need to be intensified** to improve the efficiency of enterprises, develop the capacity to acquire appropriate technology and improvise it to serve local needs. International technical assistance and services from UNIDO and other agencies will be needed for the development of local capital goods industries capable of providing the simple machinery required for industrial production.

(7) **Development of the services sector, including industrial support services** such as financial, marketing, maintenance, skills training and

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[47] Fukuchi Takeo, A model approach to programmes for Vanuatu, UNIDO, mimeograph, 26 February 1991, p.6.

management and engineering and sub-contracting services and R&D. An area of co-operation where LDCs could benefit is the free flow of professional services. Compared to the professional services offered by developed countries, the costs of services offered by an LDC expert is relatively low. Also, practitioners who deliver the services are familiar with the particular concerns of LDC consumers, and have close relations with other LDCs arising either from the specific intra-LDC regional co-operation or from cultural or other affinities.

Since the LDCs differ markedly in terms of levels of industry and vary in the extent to which macro-economic constraints inhibit their manufacturing sectors, it is suggested that the above listed proposals for strengthening manufacturing linkages to economic sectors with the aim of improving economic development should be selectively and flexibly assessed.

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11. APPENDIX

11.1 Regression analysis and results

The aim of the multiple regression analysis used is simply to try to "control" statistically many factors or variables that influence manufacturing, and also to estimate the relationship between manufacturing and other sectors of the economy in the LDCs. An estimation of the linkages between MVA growth rate and to the growth in other sectors of the economyu in the LDCs by the least squares line is not necessarily the best line in some ultimate sense. It offers, however, a necessary background for where to identify and explore possible linkages.

The cross-country regression analysis conducted involved a sample population of 37 LDCs. Their selection was based on availability of data. Annual average growth rate figures on value added (VA) between the period 1985 and 1988 were used. The main reason was neither to give mere absolute, nor percentage MVA figures, but, rather to observe the trends and changes in VA within a sizeable period of time. It could be psosible to predict that a low growth rate in one or more independent variable or sector(s) is likely to affect the performance of the observed sector.

Data used in the linkage analysis employing the regression technique is shown in appendix table 6, also the equation regressed with the variables is explained below:

LS MVAGR = C + AGRIGCR + MINGR + UTILGR + CONSTRGR + TRADEGR + TRANSGR + OTHERGR
where
LS = Least square regression

MVAGR = Annual average growth rate of manufacturing value added (dependent variable)
AGRICGR = Annual average growth rate of agriculture (independent variable)
MINGR = Annual average growth rate of mining and quarrying (independent variable)
UTILGR = Annual average growth rate of electricity and utilities (independent variable)
CONSTRGR = Annual average growth rate of building and construction (independent variable)
TRADEGR = Annual average growth rate of services including wholesale, trade and tourism, finance etc. (independent variable)
TRANSGR = Annual average growth rate of transport and communications (independent variable)
OTHERGR = Annual average growth rate of other sector other than those mentioned above (independent variable)

MVA, the dependent variable in the equation seems to be an effective indicator of industrialization or industrial development. Growth rates of MVA for the period 1985 and 1988 for the respective LDCs differ (see figure 1) falling between 15 and -8 per cent. More than halv of the LDC sample maintained a growth above zero. This does not imply that overall industrialization as compared to other economic groupings such as the developed and developing countries was better. Mozambique wqhich showed the worse as well as negative industrial trend has been and is plagued by civil war and destruction. At the other end of the MVA growth continuum is Bhutan,

a tiny land-locked and almost inaccessible country. Its performance can be simply explained by the fact that industrialization has only been recent.

The inclusion of annual average growth rate of agriculture which includes crop cultures, animal raising, fishing, and sometimes forestry form the back-bone of may LDCs economies. One can term agriculture as the "basic" sector whose efficiency would by a long way to better the chances of development. Its growth in comparison to manufacturing is shown in figure 1.

Services defined here as wholesale, trade and tourism etc., is another fast growing sector whose linkages with manufacturing needs further studies. Mineral resources endowments may provide effective linkages to manufacturing, especially when minerals are processed and used in further production. the same holds where manufacture supply the building and construction sector with the necessary domestic inputs.

The results of the regression are presented in appendix table 1 and below:

$$\begin{aligned} MVAGR = &- 0.796 + 0.316\,(AGRICGR) + 0.0543\,(MINGR) + \\ &(-1.127) \quad (2.183) \qquad\qquad (1.229) \\ &0.122\,(UTILGR) + 0.077\,(CONSTRGR) + 0.571\,(TRADEGR) \\ &(2.706) \qquad\quad (0.901) \qquad\qquad (3.660) \\ &+ 0.311\,(TRANSGR) + 0.012\,(OTHERGR) \end{aligned}$$

R2 = 0.736 S.E = 2.888 Durbin-Watson = 1.750

An R-squared of 0.74 measured the success of the regression. It indicates that about 74 per cent of the variability in MVA growth rate across the LDCs is explained by the other sectors of the economy. Also, the Durbin-Watson statistic which is a test for serial correlation is around 2. It gives the assurance that there is no problem of association between adjacent residuals.

Although AGRICGR as well as TRANSGR show low coefficients of 0.318 and 0.311, thus being relatively weak predictors of MVAGR, their t-statistics exceed 2 in magnitude. This means that there is a 95 per cent likelihood that their coefficients are not zero, and therefore, both annual average growth rates of agriculture and transport have significant influence on manufacturing.

The variable services growth rate TRADE alone with its relatively high coefficient of about 0.57, offers the best prediction for changes in the annual average growth rate of MVA in the LDCs. This relationship is made more clear in appendix table 1 and figure 1 where growth rates of manufacturing, and trade correlate (the correlation coefficient between manufacturing and services is 0.569). The t-statistics for TRADE is 3.660. It gives the strongest evidence that the annual growth rate of trade and services is the main determinant of manufacturing growth rate between the period 1985 and 1988 in the LDCs.

Thus far, it can be concluded from the above evidence won from the regression analysis that the linkages of manufacturing to the services sector in the LDCs on the whole is significant.

APPENDIX

Table 1. Regression analysis – Least developed countries
(37 observations – Dependent variable: MVA growth rate)

Variable	Coefficient	Std. error	T-stat.	2-tail sig
Constant	-0.7958	0.706	-1.1272	0.269
Agriculture: growth rate	0.3176	0.1455	2.1831	0.037
Mining: growth rate	0.0543	0.0442	1.2288	0.0543
Utilities: growth rate	0.1221	0.0451	2.7057	0.011
Construction: growth rate	0.0771	0.0856	0.9011	0.375
Trade: growth rate	0.5712	0.1561	3.66	0.001
Transport: growth rate	0.3114	0.1206	2.5823	0.015
Other: Growth rate	0.0123	0.1127	0.1096	0.914
R-squared	0.7364			
Adjusted R-squared	0.6727			
S.E. of regression	2.8897			
Durbin-Watson stat.	1.7500			
Log likelihood	-87.2569			
Mean of dependent var.	3.3189			
S.D. of dependent var.	5.0511			
Sum of squared resed	242.1680			
F-statistic	11.5706			
	Covariance	Correlation		
MVA: MVA	24.8248	1.0000		
MVA: Agriculture	5.7092	0.3350		
MVA: Mining	23.1490	0.4008		
MVA: Utililites	35.7206	0.5421		
MVA: Construction	10.6463	0.3551		
MVA: Trade	11.2694	0.5693		
MVA: Transport	11.0807	0.4859		
MVA: Other	11.3754	0.4190		

Source: UNIDO database

APPENDIX

Table 2. Annual average growth rate of value added for economic sectors, 1985 - 1988

	Country	MVA	Agric.	Mining	Utilities	Constr.	Trade	ansport	Other
1	Bangladesh	2.9	2.3	-17.1	17.9	9.0	3.1	3.8	6.0
2	Benin	1.9	4.4	-3.0	7.7	7.2	-1.3	-2.1	-0.6
3	Bhutan	15.0	5.3	13.3	73.7	4.8	0.7	12.4	9.2
4	Botswana	7.6	-5.2	16.3	11.9	2.8	7.3	14.0	10.5
5	Bukina Faso	2.7	6.2	-1.4	4.7	7.9	1.4	0.3	7.1
6	Burundi	6.6	2.7	0.9	0.0	2.4	3.1	5.4	3.4
7	Cape Verde	6.7	9.0	-2.7	5.5	7.3	6.1	5.4	5.5
8	Central African F	2.7	2.3	2.0	0.7	5.5	0.4	0.3	-1.1
9	Chad	8.9	2.2	15.8	11.1	29.1	5.8	0.0	-0.1
10	Comoros	4.9	2.5	0.0	8.4	3.1	5.0	11.3	4.2
11	Djibouti	0.7	4.0	0.0	2.2	4.3	-2.8	1.9	-0.5
12	Equatorial Guine	3.0	2.4	0.0	3.7	2.2	3.4	3.6	2.9
13	Ethiopia	3.7	-0.1	6.3	7.5	1.5	2.6	5.8	3.9
14	Gambia, The	7.2	8.9	0.0	-4.9	-3.5	4.1	5.3	3.6
15	Guinea	-3.3	0.8	-0.6	-5.1	-4.8	-2.9	0.0	-10.1
16	Guinea Bissau	-2.3	2.8	0.0	-6.7	0.6	1.7	2.0	2.0
17	Haiti	-2.8	-0.5	-27.7	5.2	1.3	-1.4	0.7	3.6
18	Lesotho	12.1	1.2	-25.5	9.1	0.0	5.1	7.3	3.8
19	Liberia	-0.7	-0.9	-5.8	1.3	-1.6	-1.9	-2.0	1.9
20	Malawi	2.8	1.6	0.0	3.9	-1.6	-0.5	-0.5	5.0
21	Maldives	12.6	4.6	5.3	0.0	6.3	19.0	-7.7	14.5
22	Mali	4.7	-0.4	6.1	8.5	5.7	2.9	7.1	4.9
23	Mauretania	4.1	2.1	4.2	0.0	2.9	-2.4	2.2	-0.7
24	Mozambique	-8.2	-3.1	-6.4	-6.5	-1.9	-1.9	-3.9	8.4
25	Myanmar	3.6	3.8	5.6	11.1	2.8	2.2	6.2	6.3
26	Nepal	7.1	4.9	2.5	15.8	7.4	3.8	1.1	5.8
27	Niger	0.3	-0.5	-3.4	8.8	-4.9	0.7	-1.7	-0.4
28	Rwanda	4.1	-0.2	-9.6	21.4	4.7	2.0	4.3	7.7
29	Sao Tomé & Prir	-1.6	10.0	0.0	6.2	-0.3	2.9	3.2	3.8
30	Sierra Leone	-4.1	3.7	-3.4	0.0	2.0	6.0	-3.8	6.5
31	Somalia	-2.5	3.9	1.4	1.3	-1.2	-1.5	3.6	-17.6
32	Sudan	5.4	2.3	5.2	5.7	1.7	7.7	0.6	-1.4
33	Togo	0.1	0.0	0.7	1.9	-7.7	-1.3	-0.1	-2.2
34	Uganda	4.1	3.9	-3.9	1.1	6.4	3.6	7.9	1.6
35	Tanzania	-2.5	3.7	-1.2	5.4	-1.8	1.5	-1.3	2.3
36	Yemen, Arab Re	11.6	2.8	46.5	19.6	-3.4	4.0	8.4	7.4
37	Yemen, Dem .R	3.7	2.5	0.0	25.1	3.8	2.2	2.8	4.4

Source: REG Database, PPD/IPP.

APPENDIX

Table 3: Shares of employment, product (per cent) and average annual growth rate for selected LDCs, 1960–1983

Country	Urban pop per cent	Services per cent			Industry per cent			Agric per cent			Percentage shares to GDP: Service			Industry			Agricul			Avge ann growth rate of labour force per cent		
	1988	1960	1977	1981	1960	1977	1981	1960	1977	1981	1960	1977	1983	1960	1977	1983	1960	1977	1983	65–73	73–83	80–90
Afghanistan	21	9	12	13	6	8	8	85	80	79	–	–	–	–	–	–	–	–	–	1.9	2.3	2.7
Bangladesh	13	10	15	15	3	7	11	83	80	74	31	32	40	8	13	13	61	55	47	2.3	2.8	2.9
Benin	40	30	38	38	9	15	16	54	47	46	–	47	47	–	15	14	–	38	40	2.1	2.0	2.1
Bhutan	5	3	5	5	2	2	2	95	93	93	–	–	–	–	–	–	–	–	–	1.9	2.1	1.9
Bukina Faso	9	3	5	5	5	11	13	92	84	82	32	49	46	13	14	19	55	37	41	1.6	1.5	2.0
Burundi	7	7	10	11	3	5	5	90	85	84	–	22	26	–	14	21	–	64	58	1.6	2.5	2.2
Centr Afr Rep	45	4	7	8	2	4	4	94	89	88	43	27	42	12	36	–	45	37	37	1.6	2.4	1.4
Chad	31	4	7	8	2	6	7	94	87	85	33	34	–	12	14	16	55	52	–	1.6	2.3	1.9
Ethiopia	12	7	12	13	5	7	7	88	81	80	23	33	36	12	15	23	65	52	48	2.2	1.4	1.9
Guinea	24	6	7	7	6	10	11	88	83	82	–	–	39	–	–	–	–	–	38	1.2	1.3	1.7
Haiti	29	14	22	19	6	8	7	88	70	74	–	–	–	–	–	–	–	–	–	0.7	1.5	2.0
Laos PD	18	13	14	19	4	6	6	83	80	75	–	24	–	–	13	22	–	63	–	0.6	0.9	2.0
Lesotho	19	5	8	25	2	4	15	93	88	60	–	55	55	–	15	26	–	30	23	1.7	1.9	2.0
Liberia	–	9	12	16	10	14	14	81	73	70	23	30	38	37	40	–	40	30	36	2.0	3.9	2.3
Malawi	14	5	8	9	3	5	5	92	87	86	31	35	–	11	18	11	58	47	–	2.4	2.8	2.6
Mali	19	3	6	15	3	5	12	94	89	73	35	45	43	10	17	21	55	38	46	2.2	2.0	2.6
Mauretania	39	6	11	23	3	5	8	91	84	69	–	37	45	–	37	–	–	26	34	1.9	2.4	2.8
Mozambique	24	12	12	16	7	20	18	81	68	66	36	32	–	9	12	13	55	56	–	2.2	3.0	2.0
Myanmar	24	21	26	23	11	19	10	68	55	67	55	42	39	12	11	14	33	47	48	1.3	1.4	1.9
Nepal	9	3	5	5	2	2	2	95	93	93	–	23	27	–	9	31	–	68	59	1.6	2.3	2.3
Niger	18	4	5	6	1	3	3	95	92	91	24	36	37	10	17	–	66	47	33	2.4	3.0	2.4
Rwanda	7	4	5	7	1	3	2	95	92	91	12	–	–	7	–	20	81	–	75	2.7	3.0	2.8
Sierra Leone	31	10	14	16	12	18	19	78	68	65	–	41	48	–	19	11	–	40	32	0.7	1.2	1.2
Somalia	35	8	10	10	4	7	8	88	83	82	38	–	39	17	–	15	45	–	30	3.8	2.0	1.7
Sudan	22	8	11	12	6	10	10	86	79	78	27	–	51	15	–	28	58	–	34	2.5	2.5	2.9
Togo	24	13	17	18	8	14	15	79	69	67	29	46	50	16	31	–	55	23	22	2.2	1.9	2.3
Uganda	10	7	10	11	4	6	6	89	84	83	35	37	–	13	8	15	52	55	–	3.0	1.7	2.8
Tanzania	30	7	10	11	4	6	6	89	84	83	32	39	33	11	16	17	55	45	52	2.5	2.5	2.9
Yemen AR	23	10	13	14	7	11	11	83	76	75	–	51	62	–	14	–	–	55	21	1.0	2.1	2.9
Yemen DR	42	15	18	40	15	20	15	70	62	45	–	69	–	–	7	–	–	24	–	1.1	1.8	2.9

Sources: World Resources, New York, Basic Books Inc., 1988 and 1989 Report, UN Sales No. E.90.II.D.

APPENDIX

Tabie 4: Total household consumption (per cent for selected LDCs, 1980–1985

Country	Food	Clothing and footware	Gross rents, fuel and power	Medical care	Education	Transport and communication	Other	Total
Bangladesh	59	8	17	2	1	3	10	100
Benin	37	14	11	5	4	14	15	100
Ethiopia	32	8	17	3	2	12	26	100
Malawi	55	5	12	3	4	7	14	100
Mali	57	5	6	1	2	20	9	100
Nepal	57	12	14	3	1	1	12	100
Rwanda	29	11	15	4	4	9	28	100
Sierra Leone	47	4	12	2	1	10	24	100
Sudan	60	5	15	5	3	1	11	100

Source: World Bank, World Development Report 1989.

Note: "Other" figures rounded up.

APPENDIX

Table 5: LDCs membership in selected regional and sub-regional organizations

Country	ACP	PTA	SADCC	IOC	SACUA	SARCC	ECOWAS
AFRICA							
Benin	XY						X
Botswana	X	X	X		X		
Burkina Faso	X						X
Burundi	XY	X					
Cape Verde	X						X
Centr. Afr. Rep.	X						
Chad	XY						
Comoros	X	X		X			
Djibouti	X	X					
Equatorial Guinea	X						
Ethiopia	X	X					
Gambia	X						X
Guinea	X						X
Guinea-Bissau	X						X
Lesotho	X	X	X		X		
Liberia	X						X
Malawi	X	X	X				
Mali	XY						X
Mauritania	XY						X
Mozambique	X	X					
Niger	XY						X
Rwanda	XY	X					
Sao Tomé & Pr.	X						
Sierra Leone	X						X
Somalia	XY	X					
Sudan	X						
Tanzania	X	X	X				
Togo	XY						X
Uganda	X	X					
ASIA-PACIFIC							
Afghanistan							
Bangladesh						X	
Bhutan						X	
Kiribati							
Lao							
Maldives						X	
Myanmar							
Nepal						X	
Samoa	X						
Tuvalu	X						
Vanuatu	X						
CARIBBEAN							
Haiti	X						

X represents membership

Y represents association with the European Economic Community in accordance with the Yaoundé Convention

Note: ACP = African, Caribbean and Pacific Group of States

PTA = Preferential Trade Area for Eastern and Southern African States

SADCC = Southern African Development Co-ordination Conference

IOC = Indian Ocean Commission

SACUA = Southern African Custom Union Agreement

SARCC = South Asian Regional Co-operation Co

ECOWAS = Economic Commission of West Afric s

APPENDIX

Table 6 Sector share to GCP for selected LDCs, 1988

(per cent ; constant GDP in market prices)

Country	MVA	Agric-ulture	Mining & quarr-ying	Electri-city & utilities	Building & cons-truction	Whole-sale, retail trade & tourism	Trans-port & commun-ication	Other
Afghanistan	-	67.31	-	-	4.66	11.12	2.73	1.39
Bangladesh	9.24	44.86	-	0.86	6.93	9.19	5.87	23.07
Benin	4.50	39.26	1.06	0.82	5.37	19.48	6.81	13.05
Bhutan	5.16	44.09	0.89	11.63	6.05	8.05	5.72	17.82
Botswana	3.31	44.88	3.44	2.36	2.88	17.57	2.55	23.27
Bukina Faso	8.99	42.40	1.85	1.00	4.20	9.99	5.62	16.42
Burundi	9.35	47.94	0.20	-	3.67	8.91	2.06	16.71
Cape Verde	5.06	21.13	0.28	2.57	17.25	31.61	10.87	13.00
C. A. Republic	8.81	39.85	2.62	0.42	2.33	19.11	3.75	13.61
Chad	15.61	47.22	0.12	0.57	1.30	30.83	-	4.43
Comoros	4.33	44.72	-	0.62	8.81	19.32	4.68	27.13
Djibouti	7.99	4.42	-	2.74	6.76	13.54	9.84	33.13
Equ. Guinea	4.16	31.56	-	0.68	4.50	9.03	2.19	27.72
Ethiopia	11.11	38.69	0.13	0.96	3.32	9.93	5.57	19.38
Gambia	4.33	33.85	-	0.31	3.24	31.90	7.73	22.57
Guinea	2.29	46.48	12.52	0.19	1.74	9.86	2.40	8.47
Guinea Bissau	1.05	46.28	-	1.05	1.30	14.17	0.32	35.59
Haiti	15.90	34.90	0.11	1.07	6.64	18.47	2.15	14.24
Kiribati	3.11	28.14	-	3.11	3.11	12.51	12.51	31.25
Laos, D.R. of	-	65.85	-	-	13.17	10.90	2.67	1.81
Lesotho	9.54	20.98	0.54	1.09	7.63	13.35	1.91	34.88
Liberia	6.80	17.83	11.45	2.53	3.49	8.19	6.27	32.41
Malawi	11.19	31	-	1.96	3.84	10.67	5.12	25.45
Maldives	4.12	18.42	1.03	-	5.61	18.42	1.03	34.44
Mali	5.07	46.63	2.24	1.03	4.27	14.14	4.06	12.15
Mauritania	7.55	26.58	12.74	-	7.57	7.35	8.09	17.97
Mozambique	19.37	36.64	0.20	3.94	6.13	4.28	8.75	8.23
Myanmar	9.36	46.63	1.27	0.60	1.56	23.07	4.23	13.31
Nepal	4.67	57.05	0.15	0.56	8.00	3.44	4.84	13.05
Niger	3.19	36.22	8.25	0.71	3.20	9.96	3.21	16.77
Rwanda	18.26	39.07	0.66	0.49	5.60	14.99	2.59	18.34
Sao Tomé & Prin.	7.34	17.58	0.29	3.54	7.27	7.98	9.60	31.15
Sierra Leone	4.35	35.65	7.03	-	3.91	17.61	8.48	21.16
Somalia	3.19	76.75	0.24	0.15	2.13	7.04	4.81	1.94
Sudan	8.14	31.69	0.13	2.21	5.03	22.35	9.39	16.91
Togo	6.39	23.92	8.75	1.71	2.80	10.27	5.73	12.92
Uganda	2.74	47.47	0.02	0.17	0.33	3.86	1.61	7.65
U.R. of Tanzania	6.67	44.52	0.60	1.30	2.60	10.61	5.44	18.41
Yemen, A.R. of	10.99	16.94	12.05	1.27	3.19	11.62	11.52	22.41
Yemen,D.R. of	5.88	10.29	-	6.62	9.19	13.60	11.03	33.54

Source: REG Database, PPD/IPP

Note: Tuvalu, Western Samoa and Vanuatu excluded due to near zero figures;
"-" refers to figures near zero.