

## FACTORS INFLUENCING THE LOCATION OF INDUSTRY IN UGANDA.

### Introduction.

This paper attempts to give a brief description of the factors influencing the location of industry within Uganda. It should be kept in mind that it is not the intention of this paper to evaluate the role of the common market on the distribution of industry between the three member states. Although this is a problem of great interest and significance, circumstances have prevented the present writer from working on this topic, and thus the analysis must be confined to locational factors within a single country, namely Uganda.

The difference between this paper and E.D.R.P. 108 (1) is essentially one of approach. The latter presented the incomplete results of a questionnaire survey carried out in Uganda and gave a brief description of the locational characteristics of the different industrial sectors. The present paper attempts to give a more systematic analysis of location factors per se and assesses their importance within Uganda. The analysis used of such factors is essentially that adopted by Greenhut. (2)

### General Comments.

Although the location of a plant or industry depends on several factors, in many cases we find that one factor is basic or governing i.e. it is of over-riding importance in the locational decision. If the governing factor leaves alternative sites, the other factors which decide the ultimate choice of location, are secondary. Thus the governing factor is the most influential ~~one~~ in determining location, and limits the range of choice to a certain area or certain type of site. The secondary factors then determine the ultimate choice.

In many cases it is, of course, extremely difficult to isolate the governing factor, and in the absence of quantitative data which may clearly illustrate the prime locational force, the governing factor has to be determined by qualitative reasoning alone. This may lead to errors of judgement, but these are inevitable in the absence of the relevant data.

The paper has four main sections:-

1. Transportation and Plant Location
2. Processing Costs and Plant Location
3. The Demand Factor and Plant Location
4. "Personal" Considerations.

### Transportation and Plant Location.

Transportation determines location through:

- a. the cost of transport, and,
- b. the type of services offered.

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(1) E.A.I.S.R., EDRP Working Papers, No. 108. F.I. Nixon, 'Some Results of a Survey of Industrial Location in Uganda', 7.10.66.

(2) See: M.L. Greenhut, 'Plant Location in Theory and Practise', The University of North Carolina Press, 1956. Part 2, 'Location Factors', pp. 103 - 177.

In those industries where differentials in transport costs outweigh differences in processing costs, the tendency is towards the decentralisation of industry, and where the market is scattered over a wide area and products are non-homogenous, decentralisation is the logical locational pattern. Transport costs are in fact a form of protective tariff to local industries. The higher is the cost of transfer, the greater is the degree of dispersion.

In the western, industrialised countries, transport costs have been of decreasing importance for the past thirty years, due mainly to the development of road transport. (3) In the case of Uganda, it is not possible to give comprehensive road transport cost data - it was possible to collect such data from only a few firms - but the data that was collected clearly illustrates the importance of transport costs, and in many cases, they are the governing factor in the location decision.

#### A. Transport Cost of the Raw Material.

This factor has been given a prominence in the literature on the location of industry which is no longer justified by present day conditions. The power of raw material attraction depends primarily upon the importance of transport costs in the total costs of production, and one cannot refer to raw materials in general as attracting an industry - there must be one dominant material for this factor to be important in determining location e.g. limestone for the production of cement. Improvements in technology and transport have lessened the influence that raw materials once exerted on location, for example, the growth of assembly activity has reduced this dependence, and in the case of Uganda, the most important raw material oriented industries are cement, fertilizer and to a lesser extent, matches.(4) In all three cases, nearness to raw material supply is the governing factor in the location decision.

The cement factory at Tororo uses approximately 200,000 tons of limestone p.a., and even though the plant is only  $3\frac{1}{2}$  miles away from the quarries, monthly transport costs total shs. 60-70,000/-. Although the limestone deposits at Kasese are of a higher quality than those at Tororo (it is, in fact, planned to construct a factory at Kasese), it was decided to locate the factory at Tororo because it was nearer to the major market areas, Kampala and Jinja (where the Owen Falls Dam was the major customer). Thus we see that although raw material availability was the governing factor in the location decision, the ultimate location choice was based on the secondary factor, nearness to markets.

The same considerations governed the location of the fertilizer plant. The Sukulu Hills are estimated to contain a 200 million ton deposit of ore containing phosphate and pyrochlore, and it is obviously essential to be as near to the raw material supply as possible. Secondary considerations were the availability of a suitable site with convenient rail facilities.

The match factory at Jinja is basically raw material oriented. The availability of a constant supply of peeler logs for the matchboxes was considered to be the governing locational factor, such timber coming from Busoga. In the absence of cost data, it is difficult to estimate how important this cost factor is, relative to other factors. Of possible equal importance, is the fact that the headquarters and the majority of the Madhvani Group of companies in Uganda are located at Jinja. Senior staff are employed directly by Madhvani, rather than an individual company, and there is a considerable interchange of personnel between the different companies, often on a day-to-day basis. Supervision and rapid consultation are made easier if the major companies are in the same vicinity, and common purchasing and

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(3) See: S.R. Dennison, 'Location of Industry and the Depressed Areas', London, 1939, p.44.

(4) The survey of Ugandan industry did not include the basic agricultural processing industries, mining activities and grain milling, which are all raw material oriented.

transport facilities are also possible. These considerations, if not the governing factor, are an extremely important secondary factor, although it is impossible to assess their quantitative importance.

Nyanza Textile Industries is an example of an industry where it is difficult to isolate the governing factor in the absence of cost data. The returned questionnaire stated that raw material availability was the most important locational consideration, but the subsequent interview placed water (3½ million galls. per day) and power availability as the most important factors. Given the political manoeuvrings behind the establishment of Nyanza Textiles and the desire to see Jinja become a major industrial centre, it seems likely that these factors, plus water and power availability were more important than nearness to raw material supply, and thus this industry is not raw material oriented.

A common pattern is found in all industries oriented to raw materials:

1. transportation costs vary more widely than do other costs at alternative locations
2. the raw material loses weight in conversion to the final product, and,
3. the transport rate on the raw material is equal to, or greater than, the rate on the final product, or even if it is lower, it is not so much less as to overcompensate the weight discrepancy.

Conditions (1) and (2) are no longer as important as formerly, especially the decreased loss in waste due to technological improvements. Given the fact that such technological improvements are being "imported" into the developing countries, it would appear likely that raw material oriented industries (insofar as their locations are tied to raw material deposits) will not assume the importance in the industrialisation process of the developing countries that they enjoyed in the industrial revolutions of the developed countries.

#### B. Transport Cost of the Finished Product.

The market factor influences industrial location in three ways:-

1. it exerts a governing force when a particular market offers the greatest profits, either because of the absence of competition or because there is no other market
2. it is the governing factor when a market oriented location yields large savings in transporting the finished product
3. it is a governing consideration when a location near to the consumer is a pre-requisite to, or greatly enhances, sales.

Point (1) is not really relevant to industrial location within a country such as Uganda. It furnishes us with a reason why a company, requiring the whole of the Uganda market, should wish to begin production there, but it does not determine the specific location chosen. It would be applicable to a smaller company, requiring only a part of the national market, which locates in a certain area to exclude rival products, but no examples of this type of behaviour were found in the companies investigated.

Point (2) is of greater relevance and importance to Uganda. This form of market orientation indicates maximum gains when:

- a. the finished product is more expensive to transport than the raw material, and,
- b. the finished good is perishable (although the perishability of the final product demands a market orientation as a means of avoiding more expensive methods of transport). (5)

The importance of market oriented industries in Uganda's industrial structure is very marked. Such industries include miscellaneous food manufacture (with the exception of meat processing), beverages, cordage, rope and twine, furniture manufacture, rubber and rubber products, structural clay products and some firms in the metal industries and engineering sector. Other market oriented industries not included in the survey are: bakery products, the smaller footwear manufacturers (this excludes Bata), made-up textile goods, printing and publishing and motor vehicle repairs.

As a general rule, the heavier and more bulky is the finished product (relative to the raw material used), the greater is the likelihood of a market orientation, and thus one must consider both the relative transport rates and the relative weights of the final good and the raw material. One of the best examples of a market oriented industry in Uganda is the soft drinks industry. Transport costs on the final product are very heavy - within a fifty mile radius of a Kampala plant, a uniform price is charged and distribution costs average shs. 2/50 /- per crate (approximately 22% of the retail price). Outside of this area, the price rises with the increase in transport costs, and thus it is essential to be as near to the consumer as possible. This factor explains the existence of quite a large number of small producers scattered throughout Uganda, although many of these have gone out of business since the recent excise duty increases. As markets expand, branch plants will be set up and the industry will become more decentralised.

One of the most familiar cases of a market oriented industry is the process requiring a ubiquitous factor, for example, water. This means that the final product is heavier than the transported raw materials, indicating a location near to the major market. The brewing industry is a case in point, where nearness to markets is essential, but where the governing factor in the location decision is an adequate water supply. These remarks are of course applicable to the soft drinks industry to a large extent, although the minimum economic scale of production (6) is smaller, thus allowing a greater degree of decentralisation than is the case with brewing.

Three other major market oriented industries in Uganda are bicycle tyres and tubes, agricultural hoes and industrial gases. All three consider nearness to markets to be the major locational consideration.

The industrial gas producer is located in Kampala, this decision being based on a survey of potential industrial development in Uganda, carried out by the company in 1953/54. It has since become apparent that Jinja is the main market for industrial gases, and if Jinja continues to expand at the present rate over the next five years, the Kampala location will no longer be economic and steps will have to be taken to move (in some form) to Jinja. Cylinder handling is the company's major problem and to save both time and money, it is essential to be close to the main consumers.

In the case of agricultural hoes and bicycle tyres and tubes, Uganda is the major East African consumer, and thus these two industries fall under Point (1) discussed above. Nearness to markets dictated a Uganda location, but other factors were instrumental in determining the actual site chosen. (7)

The third case of market orientation is when nearness to markets enhances sales, because consumer demand may be extremely volatile and it is necessary to meet changed requirements as quickly as possible. The manufacture of fish-nets in Kampala is probably the prime example of this kind of situation.

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(6) The break-even point is approximately 50,000 cases per month.

(7) In the case of agricultural hoes, there is some confusion as to whether this is in fact a market oriented industry. Raw materials account for 60% of the final price of the hoe, and given the heavy transport costs involved, it is advantageous to be near the raw material supplier - in this case, the Jinja steel works.

Fish-nets had been imported by the parent company for thirty years and when it was decided to begin production in Uganda, Kampala was the obvious location. The market is concentrated mainly on the shores of Lake Victoria, and the demands for different types of net varies with the season and the weather. The need to satisfy these varying demands as quickly and efficiently as possible, plus the fact that Kampala is the main market for fish and the fishermen usually buy their nets when they sell their fish, make a Kampala location essential.

It is interesting to briefly compare the above observations on market oriented industries with conditions prevailing in England. A survey carried out in the 1930's (8) records proximity to markets as being of major importance, but except in a few cases, the cost of transport to the market was not an important item. The desire to be close to the market involved other elements, namely:

- a. the need to maintain close contacts with consumers
- b. the development of "service" in the supplying of various products
- c. the need to speedily fulfill orders.

'As industry becomes diversified, as the needs of consumers grow and their interests become more closely served, the market exerts a stronger attraction...' (9)

Although this factor is not of significant importance in Uganda at the present time, its influence will be increasingly felt in the future with the development of a greater number of consumer goods industries.

#### Processing Costs and Plant Location.

If raw material and demand considerations have only a weak locational pull, the selection of a site may be due to processing cost factors (or, of course, personal factors). This would be particularly relevant in the case of compact products with low transfer charges but involving a complex production process.

The most important processing cost factors are:-

1. land - availability and cost
2. labour - wages, productivity, turnover, supply and labour laws
3. capital - availability and cost
4. managerial talent - availability and cost
5. taxation

Other processing cost factors such as utility charges, climate, health and education and institutional factors will not be systematically dealt with but only mentioned when considered to be relevant.

#### Land.

Land is completely immobile and this gives rise to large differentials in price (rent). All the industries investigated in Uganda were urban based, and thus rent differentials between urban and rural sites did not enter into the picture. But the availability of land is an important locational consideration. (10)

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(8) the survey was carried out by the magazine 'Business' in 1935. Quoted in Dennison, op. cit., p.61 - 72.

(9) ibid. p. 72.

(10) 40% of the firms returning the questionnaire considered the availability of a suitable site to be an important locational determinant within Uganda.

Land suitable for industrial development is now non-existent in Kampala, and the growth of Jinja in the past few years is in large part attributable to the fact that it has ample land, with good rail facilities, suitable for such development. The establishment of an industrial estate in Kampala will alleviate this problem to a certain extent, but Jinja will continue to grow because of the availability of good sites and other facilities.

Few firms have received government assistance to develop the site and improve on local transport facilities - either a feeder road or rail siding to the factory, and most firms developed their own sites.

### Labour.

Human resources are relatively immobile in the short run, and this helps to explain differentials in real wages between regions. These are costs to the industry and must therefore be taken into account in the location decision. Supplies of suitable labour have always been stressed in the past as being an important factor, but this is not a general feature, relevant to all industries. Labour supply is created at those points where industry is located for other reasons, and the existence of a supply of labour therefore, has less attractive force than that exerted by other factors.

Although most firms in Uganda mentioned an adequate supply of unskilled labour to be an important locational consideration, no labour supply problems were encountered in any of the urban and semi-urban centres. At all locations there exists an excess supply of unskilled labour and this factor is therefore not a determinant in any location decision. Although some employers did mention a preference for workers from certain tribes, the labour force of all the factories investigated was of a very mixed tribal composition, the area in which the factory was located usually supplying the largest proportion of workers. No significant differences were observed in aptitude or ability between different tribal groups with respect to industrial work.

It is surprising to note that the availability of skilled labour was not considered to be a locational determinant of any importance, except in the case of seven firms where it was thought to be an influential consideration. Only one firm (in the engineering sector) considered it to be the governing locational factor, and in the other cases it was secondary to more important factors. Most of the large companies train their own labour on the job, and the majority of their labour force is considered to be semi-skilled. Difficulties were encountered in recruiting skilled mechanical staff, but such difficulties are encountered throughout Uganda, and no one centre was at an advantage in this respect.

Wage differentials in different parts of Uganda are not important with respect to location. Other factors e.g. transport facilities, far outweigh any influence wage differentials could exert on the location decision, and the same is true of possible productivity differences at various locations. This is not to deny that such considerations will not be important in the future. Once adequate infrastructure facilities are extended to the present semi-urban centres, and industrialists begin to consider these centres as viable locations, the lack of a permanent, semi-skilled labour force in these centres could be an important drawback to their development. It remains to be seen if lower wage costs in these centres will offset the advantages that Kampala, Jinja and Tororo will enjoy in terms of an experienced industrial labour force.

Labour turnover was no longer considered to be a significant problem among the firms investigated, and in most cases, labour turnover was only about 1 - 2% p.a. of total labour force. A permanent, urban industrial labour force has been slowly developing in the past 6 - 7 years in the main centres, and, as mentioned above, this factor will assume greater importance as a locational determinant in the future, than it at present enjoys.

Labour laws are not important in a country such as Uganda (insofar as they influence location), but if major differences appear in the labour laws of the three East African countries in the future, this could have important locational consequences. But within any one country, they are unlikely to be important. These remarks also apply to the influence of trade unions on industrial location.

### Capital.

In any general theory of location, the availability of capital in different areas will probably have some influence on location. Capital in fact, has a three-fold significance:-

- a. availability of funds
- b. cost of funds
- c. availability and cost of capital to consumers and suppliers of the locating industry.

The availability of capital is rarely, if ever, a significant determining factor in the location decision of the larger companies, but for small companies, the availability of loan capital is often a limiting factor in location, more important than the interest rate charged. The larger company may be indirectly influenced in its location decision by the availability of capital to its customers and suppliers, but no examples of this type of situation were observed in Uganda. Very few firms stressed the importance of capital availability as a factor in their location decision, and those that did (seven in number) were small, private companies (the availability of capital to the smaller companies will be discussed in a later section). As a locational factor in the decisions of the large expatriate and U.D.C. companies, capital availability is of no significance.

### Managerial Talent.

Managerial ability will only be found in the larger centres, and this factor can be important in the location decision via its influence on processing costs. But it is of more relevance to a developed, than a developing, country. A very large proportion of managerial staff is expatriate, employed by the parent company abroad or on secondment to U.D.C. companies. They are made available to a firm, whatever its location, but they do not influence that location (at least not within Uganda). The availability of local managerial ability is so limited as to be unimportant (as a locational factor) at the present time, but as a nucleus of African managerial talent forms, this could be a quite important consideration in the future.

### Taxation.

Taxation has been found to be a minor factor in plant location decisions (11), and there is little evidence to assert either that high taxation drives away capital or that low taxation attracts it. It may be the deciding factor in individual cases, when one location must be selected from several satisfactory locations, but in general, its effect on industrial location is not significant, this being especially so in the case of Uganda.

### Processing Costs and Industrial Concentration and Dispersion.

There are a number of processing cost savings that take the form of concentration advantages:-

1. if a large supply of labour is available at a particular centre, those industries with seasonal labour demands or those enjoying economies of large scale operation, will benefit from this factor in the form of lower costs.

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(11) See Greenhut, op. cit., p. 137.

2. it is possible to obtain cheaper and quicker replacements of parts for machines from subsidiary companies in the larger urban centres
3. other factors are more favourable in the larger centres e.g. insurance and commercial facilities, power and fuel availability, availability of capital, etc.

But there are strong decentralising forces at work:-

1. higher wage rates in the larger centres plus the possibility of more labour disturbances
2. there may be higher transport costs to distant markets - this leads to branch plant dispersion e.g. soft drinks industry
3. higher rents (Kampala - non-availability of land)
4. higher water processing and waste disposal costs.

It is extremely difficult, if not impossible, to isolate quantitatively the external advantages of a location in a large urban centre i.e. the advantages of agglomeration (or external economies of scale). (12) They do not appear to be significant within Uganda, and the only factors of any significance refer to Kampala. They are:-

- a. a greater range of insurance and commercial facilities are available in Kampala, than at other locations in Uganda
- b. it is often easier to obtain service and maintenance facilities in Kampala than elsewhere, although many spare parts have to come from Nairobi
- c. nearness to an international airport (Entebbe) is considered to be of importance in some cases investigated.

One of the most important deglomerative forces in operation has already been mentioned, namely the non-availability of land for industrial development in Kampala.

External economies only become significant on an East African basis - Nairobi enjoys agglomerative advantages not found in Kampala - but within a country at Uganda's stage of development, they do not appear to be important. An assessment of their importance within Kenya is the basis for future research.

#### The Demand Factor and Plant Location.

Cost considerations present only one side of the location problem; the demand factor also helps to explain plant location and therefore it must be briefly mentioned here.

When consumers are scattered over an area, each seller is a monopolist with respect to consumers located near to his plant, and thus sellers tend to disperse to monopolise as great a part of demand as possible. The least-cost location becomes not merely the site at which the firm sells greater at the given market price and achieves greater gains per unit sale; it also enables the firm to undersell its rivals at several consuming points and thus places a wider market area under its control. Both cost and demand factors have to be taken into account. (13)

The Ugandan market is too small for such considerations to influence

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(12) See Nixon, op. cit., p. 9.

(13) This paper is not the place for a detailed description of these theories. See Greenhut, op. cit., pp. 140 - 162, and references given there. In E.D.R.P. No. 84 (22.10.65) the present writer attempted to apply current location theory to East African conditions.



location within the country, but it is a possible explanation of why some firms comes to Uganda. It remains to be seen how important this factor is in East Africa as a whole. The enamellware industry is a case in point (with plants in Kampala, Dar es Salaam and Mombasa), but the above considerations do not appear to be important in this particular example.

#### Personal Considerations and Plant Location.

The influence of personal considerations on plant location has often been stressed. But this factor is a complex one, and a closer analysis reveals many aspects which are similar to cost and demand factors.

Personal factors can influence location in three ways:

1. indirectly affecting cost
2. partially determining demand - indirectly related to costs
3. providing non-pecuniary rewards - these are "purely personal considerations".

Greenhut (14) makes the distinction between pure cost and revenue factors and cost-reducing and revenue-increasing factors.

Cost-reducing factors refer to certain gains arising from agglomeration or deglomeration (the advantages of agglomeration referred to above are a mixture of cost and cost-reducing factors), and the cost-reducing factor is distinguishable from the cost factor in that it emphasises the relationship between physical distance and costs other than in terms of transportation costs and labour costs e.g. the price of a raw material is a cost factor, but its availability, apart from its price, is a cost-reducing force. Revenue-increasing factors are those forces of an agglomerating - deglomerative type which affect sales e.g. need for quick delivery. It is not intended to discuss these factors in greater detail - reference has already been made to their original formulation and analysis - but of particular importance to Uganda are Personal Cost-Reducing factors and Personal Revenue-Increasing factors, and the remainder of this section is devoted to a discussion of their importance within Uganda.

#### Personal Cost-Reducing and Revenue-Increasing Factors.

Personal Cost-Reducing factors are cost savings that arise from the personal relationships between seller and buyer. An entrepreneur may seek a location near to a particular raw material supplier or banker because he believes (or knows) that friendship will influence the availability of materials or funds. The emphasis is on personal contact. From the revenue-increasing point of view, many entrepreneurs believe that already existing contacts with customers (whether at the wholesale or retail level) promote sales.

#### Purely Personal Considerations.

In many cases, entrepreneurs are limited in plant site selection by preferences in home environment, and psychic income considerations may dominate the plant location. These considerations are indirectly related to cost and demand factors insofar as they affect the sales of products or purchases of factors through their influence on the entrepreneur's own service. The connection between purely personal considerations and price thus lies primarily by way of imputed cost. Personal contentment at a certain location may enhance the entrepreneurs sales ability, but this type of factor is basically non-pecuniary.

### The Case of Uganda.

The influence of home environment was found to be very strong in the case of Uganda. The Asian entrepreneur dominates all sections of Ugandan industry (especially medium and small scale industrial enterprises) and in most cases it was found that the entrepreneur had established his business in the area where he lived. Examples of this development can be seen in the following sectors: miscellaneous manufacture of food, wood and furniture, oil milling, soap and other chemical products and engineering. The question that must be answered is whether this situation was due to purely personal considerations or whether cost-reducing and/or revenue-increasing factors were at work.

The majority of Asian industrialists (both large and small) have probably been in Uganda between 30 and 50 years. Most of them were engaged in trade, commerce and to a lesser extent, agriculture (the most notable example of the latter being Madhvani). Once capital had been accumulated (or became obtainable) and the decision taken to go into manufacturing, the entrepreneur would almost inevitably remain in the area where he lived, and it would appear that cost-reducing and revenue-increasing factors were of far greater importance than purely personal considerations. A good example is found in the soap industry. The (at present) largest soap factory in Uganda was established in the 1930's, the founder having good connections with local wholesalers and retailers. These contacts were useful in developing a sales organisation, and the established sales network was later the most important reason for the expansion of the business.

This example seems to represent a fairly typical development. Founders of enterprises developed business and social contacts, of value in both the establishment and expansion of the business. Because of personal contacts, capital and credit were more easily available and raw material supplies could be more freely obtained because of this personal factor. The major decision to be taken was therefore not where to produce, but what to produce. It is estimated that the location of about 37% of the firms investigated was strongly influenced by such cost-reducing and revenue-increasing considerations. No example was found where purely personal considerations dominated the locational choice.

The above method of analysis helps us to obtain a clearer picture of the locational pattern existing within Uganda. It is not enough simply to state that nearness to home was the major locational consideration - this factor has to be investigated in greater detail, and it is to be hoped that the above analysis has made the picture a little clearer.

### Conclusion.

This paper has attempted to isolate and define those factors considered to be of importance in influencing industrial location within Uganda. It is essentially qualitative, and thus open to dispute, because of the absence of quantitative data, and also because of this, it is difficult to say which are the most important factors. It would appear that transport cost considerations (especially the transport cost on the final product) are of predominant importance, closely followed by the cost-reducing and revenue-increasing factors discussed in the preceding section. Processing cost factors do not appear to be of significant importance within Uganda. Finally it should be remembered that in many cases, no single factor can indicate a location, and many influences are at work. Some margin of error is to be expected in the absence of quantitative data.