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SOME RESULTS OF A SURVEY OF INDUSTRIAL LOCATION
IN UGANDA.

Introduction.

The purpose of the present paper is simply to present the results of a questionnaire survey on the location of industry in Uganda carried out in July and August of this year. It is not an attempt to give a comprehensive and definitive explanation of industrial location because at the time of writing, the interviewing of all major firms had not been completed. It therefore presents only tentative conclusions, which may have to be altered in the light of later information.

A copy of the questionnaire used is attached to the paper (Appendix A).

Data on the Questionnaire.

The questionnaire was sent to all firms covered in the Census of Industrial Production, 1963, (except for some sectors specifically excluded), which gave a fairly comprehensive coverage of all firms in Uganda employing more than 10 persons.

The total number of firms sent questionnaires was 82, 56% of whom replied. Two of the firms replying employed less than 10 persons and one claimed not to produce anything. A list of the number of firms in each sub-group in manufacturing plus the number of replies obtained is given in Appendix B.

Nine of the returned questionnaires were useless for analytical purposes. Deducting these from the total number of replies gives a useful response rate of 44%.

The Questionnaire.

It may be of interest to make a few general comments on the use of questionnaires.

The present questionnaire was confined to one side of foolscap and subsequent interviews have confirmed the value of keeping a questionnaire as brief as possible.

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nt of importance is that only a few of the
ires can be used without an interview to
fy certain points. Indeed, a very distorted
tained if conclusions were based solely on the
element of deliberate distortion is probably
economic rationalisation of otherwise irrational
n evidence. This will be discussed later in the

Often the questions are misunderstood. A good example of this is the case where an "adequate supply and satisfactory type of water" was important in the location decision, but it was subsequently discovered that the water was for domestic purposes only.

Thus great care must be taken in analysing the questionnaires and it is of value to interview as many firms as possible in order to check the answers given.

Sector Analysis.

Miscellaneous Food (202/209).

Eight firms were sent questionnaires in this sector and six replied, five of which were useful.

The most important factor in this group appears to be access to markets plus the expectation of their continued growth. Most food manufacturing industries are market oriented (except meat processing which normally takes place near to sources of supply) and Kampala and the surrounding area is the major market, hence the concentration of these firms in Kampala.

The availability of a suitable site and the availability and cost of transporting raw materials appear to be of roughly equal importance from the replies received.

Older firms would not have experienced any difficulty in obtaining a site in Kampala, but it is now impossible to obtain land suitable for industrial development. This would therefore be an obvious consideration for any new firm.

The importance of the raw material supply will depend on the nature of the product in question. With milk processing for example, the milk is imported by train from Kenya and it is then processed and distributed. It would, of course, be cheaper to use Ugandan milk, but only very little is available and there appears to be no hope of achieving self-sufficiency during the present five-year planning period. In the case of other firms in this sector, the availability of locally grown raw materials is considered to be of importance.

Competition from Kenya products is mentioned by one firm located at Jinja, but this appears to be an isolated case and the usual reason for the importation of Kenyan products appears to be the non-production of them in Uganda.

Given the expected growth in incomes and the increasing extent of urbanisation, the demand for processed foods will expand and we can expect this industry to distribute itself more evenly over the country as markets expand elsewhere. This process appears to have started already - for example - a meat canning plant is to be established in Soroti. (1)

Miscellaneous food manufacturing is an important growth industry and relatively foot-loose. It could thus be instrumental in achieving a more balanced distribution of industry throughout Uganda.

Beverages (211/213/214).

Nine questionnaires were sent out and eight replies received.

(1) See Uganda's Second Five Year Plan, 1966 - 1971, p.87.

1. Soft Drinks (214)

Access to markets is again the most important consideration in the location decision. Transport costs on the finished product are very heavy - within a 50 mile radius of Kampala, distribution costs are shs.2/50/- per crate - and thus nearness to the market is essential. This factor explains the quite large number of small producers scattered throughout Uganda, although many of these have gone out of business since the recent excise duty increases.

The availability of a suitable site is also of importance, and the comments made above (in the section on miscellaneous food) are relevant here.

An adequate supply of water ranks third in importance, water being the most important ingredient in the production process. It is always purified before use, therefore quantity, not quality, is the important consideration.

Coupled with this, of course, is the need for adequate sewage disposal facilities.

Raw material supply, as a location factor, does not appear to be of particular importance, but emphasis is placed on the quality of inputs. Both sugar and bottles are imported from outside of East Africa, this policy proving cheaper than using Ugandan sugar and Kenya produced bottles. The local production of bottles is not looked upon with enthusiasm.

The essential location characteristics of this industry are similar to those of miscellaneous food, described above. As markets expand, this industry will be distributed more evenly, and it has already been recommended that a new plant should be established in Mbarara and possibly one in Soroti. (2) A more even distribution of soft drink production will cut retail prices (via lower transport costs) and thus stimulate the consumption of soft drinks.

2. Breweries (213).

Neither of the breweries had been interviewed at the time of writing and the two questionnaires are sufficiently different as to make any general analysis extremely difficult and probably invalid.

Textiles, Footwear and Wearing Apparel (231/233/241).

Questionnaires were sent to six firms in these categories and four replies were obtained.

1. Textiles (231).

Both firms in this sub-sector are located at Jinja and both agree that the availability of raw materials i.e. cotton, is the most important locational factor. The finished product is a lot easier to transport than the raw material input.

There is some agreement on the degree of importance of the availability and cost of fuel and power and an adequate supply and suitable type of water, and these appear to be the second most important location factors.

(2) See: Final Report of Soviet Experts on the Planning of Light and Food Processing Industries: Ministry of Commerce & Industry, Kampala, July, 1965, p.27-28.

Adequate supplies of unskilled labour, mentioned as being taken into account in the location decision, are not peculiar to Jinja such labour being in plentiful supply everywhere in Uganda, and Jinja possesses no special advantages in this respect.

Probably the factors of greatest importance in the location decision were:

1. the political manoeuvrings behind the establishment of Nyanza Textile Industries (details of which are not available to the present writer), and,
2. the head offices of the Madhvani Group of Companies are situated at Jinja, this having a critical influence on the location of the other textile factory.

2. Cordage, Rope & Twine (233).

The Uganda Fish-Net Manufacturers Ltd. is the only firm in this sub-sector, and it developed from a company which had been importing fish-nets for the past 30 years.

Nearness to markets is the essential locational consideration, speed and ease of supply, rather than transport cost, being the main concern. The market is concentrated mainly on the shores of Lake Victoria, and the demand for different types of net varies greatly with the season and the weather. The need to satisfy the fishermans demands as quickly and as 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 catch, made Kampala the obvious location for such a concern.

Ten per cent of the total labour force is regarded as skilled labour, consisting of semi-skilled supervisors needed to organise and supervise the different departments. Training is carried out in the factory and they must have a good secondary education and speak English. It was felt that this type of labour is more readily available in Kampala than elsewhere.

3. Footwear (241).

Only one firm in this sector replied to the questionnaire and it has not yet been interviewed, so this section is based solely on the replies given in the questionnaire.

Access to markets is given as the most important locational consideration, with the anticipated growth of markets ranking second. Kampala and the surrounding areas constitute the largest and wealthiest market and approximately 70% of all shoe manufacturers are in Kampala, Jinja having the second largest concentration.

An adequate supply of unskilled labour is also considered to be important, but as mentioned above, such a supply would be available anywhere and therefore cannot be said to be a determining factor in the location choice.

Manufacture of Wood and Furniture (259/260).

Given the general structure and characteristics of this industry, it was decided not to include it in the questionnaire survey on the grounds that a priori reasoning would be sufficient to explain the locational pattern.

The industry is characterised by a large number of small producers - only approximately 25% of firms employ more than 10 persons - widely scattered over Uganda.

Out of the larger producers, approximately 40% are located in Kampala and 26% in Jinja.

The finished product - furniture, packing cases, etc. - is bulky and difficult to transport. Wood is relatively ubiquitous and easier to transport and thus there is a concentration of producers in the larger market areas. Nearness to market is the major locational consideration, hence the wide scattering of very small producers supplying almost negligible, isolated demands.

Rubber and Rubber Products (300).

All the firms except one in this sector are tyre retreaders and were not included in the survey. Tyre retreaders must obviously locate where a demand for their services exists and at present there is a concentration in Kampala with individual firms at Jinja and Mbale.

No information is at present available on Dunlop East Africa Ltd.

Basic Industrial Chemicals (311)

Four firms were sent questionnaires in this sector, three of whom replied but only two of the questionnaires were useful for analytical purposes.

In the case of fertilizers, nearness to raw material supply is the most important consideration. The Sukulu Hills are estimated to contain a 200 million ton deposit of ore carrying phosphate and pyrochlore. The soil is quarried and pumped down to the factory and contains approximately 30% fluo-apatite, which, when mixed with sulphuric acid gives a soluble phosphate, the basis of single superphosphate fertilizer.

The availability of a suitable site (with a rail siding originally built for the cement factory) was also of importance, and the site was chosen after a feasibility study had been carried out.

An adequate supply of water is a major consideration in such an industry. Mining and extraction operations at present use 500,000 galls. of raw river water per day, and the Company is looking for a source that will eventually yield up to 5 million galls. per day. Thus difficulties may be encountered over water availability in the future.

The disposal of the water after use (a thick brown colour) also presents many problems.

The only other company which returned a satisfactory questionnaire in this sector is located in Kampala. This company is primarily market oriented and it appears that the location of its future major customers was miscalculated when the company was established in the 1950's. Jinja, rather than Kampala, is the major consuming area. No other information is at present available.

Oils and Fats (312).

This sector was not included in the survey because:

1. it was assumed that location could be explained on a priori grounds, and,
2. a comprehensive study of this industry is being undertaken at the Institute by Mrs. D.M.S. Coles, and the data given in

EDRP 107 ("Some Results of a Study of the Vegetable Oil Crushing Industry in Uganda") appears to be sufficient, with the qualification that oil crushing mills were probably set up in the areas where the entrepreneurs lived (assuming adequate raw material supplies were available), the location decision being based on other than purely economic grounds (see section below).

Soap and Other Chemical Products (319)

Seven firms were sent questionnaires in this sector and five replies were received.

This industry is almost completely Asian dominated and most of the firms were established 30 - 40 years ago on a small scale, and gradually developed as the market for their products expanded. The founders of the businesses would develop both business and social contacts, which would be of value in establishing their firms and expanding them. Thus we find that the major factor in the location of plants in this industry is nearness to the home of the founder, and many made this point quite explicit in the questionnaire.

A typical example is the business established in the 1930's, with the founder having good connections with local wholesalers and retailers. These contacts were very useful in developing a sales organisation, and the established sales network was later the most important reason for the expansion of the business.

Given this basic reason for location, the businessman lists those factors that have subsequently proved important and which justify the original location. Access to markets is the most important of these factors, the majority of firms being located in Kampala with smaller establishments at Jinja, Tororo, Mbale and Soroti.

The availability of an adequate supply of unskilled labour appears to be the next most important consideration and for the newer firms, the availability of a suitable site is often mentioned.

Clay and Cement Products (331/332/334/339).

Only three firms were investigated in this sector, two in glass and glass products (332) and cement (334).

It was thought that structural clay products (331) and miscellaneous non-metallic mineral products (339) did not present significant location problems. Given the nature of the final product (bulky, heavy and of low value), transport costs must be kept to the absolute minimum, and these firms will produce as close to the sources of demand as possible. In many cases, clay blocks will be produced on the actual building sites. Such plants are therefore widely distributed throughout Uganda.

The glass and glass products sector produced disappointing results. One questionnaire was returned with the message "We have not any industries here" in a prominent position, and the other firm employed less than 10 persons, although they thought that capital was more easily available in Kampala and this consideration had been important in their location decision.

The cement industry provided the best return. This is obviously a raw material oriented industry, and approximately 200,000 tons of limestone is used each year, and even though the

factory is only $3\frac{1}{2}$ miles away from the quarries, monthly transport costs total shs.60-70,000/-.

Other raw material requirements consist of clay (26,000 tons p.a.) which is obtained locally, and fluospar, 2,000 tons of which is imported each year from Mainland China and Belgium. Charcoal, used for firing the kilns, comes from Eldoret.

The whole of the Ugandan market is supplied with a concentration of demand in and around Kampala. Problems are encountered in the cotton and coffee seasons when insufficient wagon capacity on the railway is available and road transport must be used. As an ex-factory price is charged, this does not directly affect the industry's costs.

A suitable site was available for the factory and a rail siding was constructed from the main line to the site.

This industry is completely tied to raw material sources and thus any future expansion will take place at Tororo and/or Kasese.

Metal Industries and Engineering (341/350/370).

Forty one firms were sent questionnaires in this sector and seventeen replies were received. Of those replying, two employed less than 10 persons and a further three of the returned questionnaires did not contain sufficient information for analytical purposes, thus giving twelve useful replies.

Approximately 50% of firms in the category "Other metal products except machinery and transport equipment" (350) employ more than 10 persons. Because of the heterogeneity of products and services originating in this sub-sector, it is difficult to isolate any dominant location factors. In the case of the smaller concerns, nearness to place of residence is again of considerable importance. Small engineering workshops came into being via the demands of oil mills, cotton ginneries etc. for general repair work and spare parts. It should be emphasised that although the location of such a concern was determined by the entrepreneurs place of residence, an adequate market demand was necessary to make the enterprise profitable.

Thus access to market is of equal importance to this personal factor, and the production of agricultural hoes at Jinja, for example, is an example of market orientation (although in this case it is quite possible that the availability of a suitable site was of greater importance in selecting Jinja rather than Kampala). One firm stressed the availability of raw materials, but no further information on this aspect of the problem is at present available.

It is only when one comes to this sector that one finds the availability of skilled labour mentioned as a determining factor in the location decision. The need for a certain degree of skill in much repair work and general engineering is fairly obvious, and it is to be assumed that such labour is relatively more available in Kampala (and to a lesser extent, in Jinja) than elsewhere. The lack of skilled workers is also mentioned as a major factor retarding expansion.

A fourth point of interest in this sub-sector is the fact that many of the smaller firms lack the necessary capital (or commercial contacts needed to obtain capital) for both the replacement of old

and obsolescent machinery and for the expansion of activities. This is a greater problem in up-country towns than in Kampala, but its significance here should not be overlooked.

Basic Iron and Steel Products (341).

In 1960, the decision was taken by the Madhvani Group of Companies, in association with U.D.C. and two Italian firms, to build a steel mill at Jinja. The main considerations in the selection of Jinja as a site were:

1. plentiful water supply
2. large quantity of electric power
3. suitable land available
4. rail service to the factory and efficient rail network for transport of scrap metal and finished products. (3)

Although the above are sound economic reasons and are obviously valid in the case of this decision, a significant consideration was the proximity of other firms (and offices) in the Madhvani Group. This factor would obviously have been of less consequence if the other factors, listed above, had not been available at Jinja, but it undoubtedly played a vital role in the entrepreneurs' final decision.

Electrical Machinery, Apparatus and Appliances (370).

The firms in this group are mainly engaged in repairing and as such are market oriented. Lack of skilled labour and lack of capital are the two factors retarding the growth of this sector.

Other Industries.

A number of sub-sectors have been omitted from this brief survey. Grain milling, bakeries, saw mills and general repair work (motor vehicles, motor cycles and bicycles) were excluded on the grounds that their location does not present any significant problems. They must either be in close contact with their customers e.g. bakeries, repair work, or else they are roughly distributed vis a vis their raw material supplies e.g. sawn timber.

Information is available on B.A.T. (Uganda) Ltd. but as it was given in confidence, it is not possible to give details here.

Location Factors.

It is not proposed to give a detailed examination of factors influencing location. As stated above, the answers given in the questionnaires are not of sufficient accuracy to allow such an analysis until interviews are completed and a more objective judgement made.

Comment will therefore be confined to three points of general interest - the influence of (mainly) Asian entrepreneurs on location, external economies and the market orientation of industry in Uganda.

1 The Asian Influence.

The influence of the Asian entrepreneur has already been mentioned in the section of Soap and other Chemical Products, but

(3) See: East African Trade and Industry, Vol. X, No.110, April 1963.

a few general comments will not be out of place here.

The majority of Asian industrialists have probably been in Uganda between 30 - 50 years and they tended to settle in the already established trading centres. Most of them were engaged in trade, commerce and to a lesser extent, agriculture (the most notable example of the latter being Madhvani), and once some capital had been accumulated and the decision taken to go into manufacturing, the important question was not where to produce but what to produce. The entrepreneur, taking the location as given, would have to roughly assess the market potential for various kinds of products and services and then decided which prospect offered the most profitable return on capital. The decision would be easier if the entrepreneur had special skill or experience in one particular field, and if there was insufficient demand for this product or service in the home area, it is quite possible that the entrepreneur would move to where the demand for his particular skill was greater (although the present writer has not yet discovered such an example).

Alternatively, the entrepreneur may have come to East Africa intent on producing a particular product or service and would settle in that area where demand was adequate to support him.

Once the basic pattern had been set by the earlier entrepreneurs, a more logical location pattern follows. Contacts are developed, capital may become more easily available and a manufacturing centre develops. A certain development process is set in motion which is cumulative in character, until retardation factors appear e.g. high price of land.

In discussing the role of the Asian Community on the pattern of industrial location, it is, of course, extremely difficult (and possibly very misleading) to isolate any one factor and invest it with supreme importance. A combination of factors have all exerted varying degrees of influence, not least among them the apparent innate economic ability of the majority of Asian entrepreneurs to produce the right goods in the right place (or even if neither variable is optimal, at least make a profit).

These remarks have validity for the food processing, wood and furniture, oil milling, soap and engineering sectors.

2. External Economies.

By external economies we mean any influence, external to the individual firm, and beyond its control, excluding demand for its product that gives a reduction in costs to all firms in that industry (at the same place). The economist assumes that as a centre or area develops, external economies are created, giving rise to lower costs of production than would otherwise be the case.

An investigation of external economies is an extremely difficult process for two main reasons:

1. the average businessman does not really have many ideas about external economies. Even if he has heard the term before, he will be unable to give a quantitative estimate of their importance.
2. from (1) follows the fact that external economies are difficult, if not impossible, to measure. One would need comprehensive sets of cost data for two firms in different locations, producing (by the same production methods) the same amounts of similar products under identical cost conditions. If one firm, over a certain period of time, could produce at a lower cost per unit of Output than the other, only then would it be possible to give a quantitative estimate of the influence of external economies.

At present therefore, an attempt is made to give some qualitative estimate of the influence of external economies, and the conclusion reached on the basis of present information is that, within Uganda, external economies are not very significant.

Two general advantages of a Kampala location so far mentioned are:

- a. the range of insurance and other commercial facilities is greater in Kampala than elsewhere, and,
- b. it is often easier to obtain maintenance and service facilities in Kampala than elsewhere, although in the case of machinery spare parts, Kampala is actually at a disadvantage as a great many of them have to come from Nairobi (this is true in the case of the soap industry).

It would appear that within Uganda, external economies are not significant (external diseconomies may be more important in Kampala due to the virtual non-availability, and hence, high cost, of land for industrial purposes). (4) External economies only become significant on an East African basis e.g. the advantages of a Nairobi location, and an assessment of their importance will be the basis for future research.

3. Market Orientation of Industry and its Implications for the Future.

A brief glance through the paper establishes the fact that a very large proportion of industry in Uganda is market oriented (5), either because of high distribution costs e.g. soft drinks, or because of the need for the quick fulfillment of customers demands e.g. fishnets. The implication of this for the future distribution of industry is obvious. Omitting those firms that will be able to supply the whole of the Uganda market for a long time to come, a more even distribution of industry will come into being as incomes grow and become more evenly distributed throughout the country, simply because of the location characteristics of the industries likely to expand. This tendency will of course be reinforced by deliberate action on the part of the Government to achieve a wider distribution of industry, and the setting up of new industries in other centres.

Thus in the future we can expect the development of such centres as Lira, Gulu, Masaka, Mbarara, Mbale, Soroti, Hoima, Fort Portal and Arua (not necessarily all these centres). Concentrations of industry will of course remain and further develop - for example, the possible development of a heavy industry complex at Tororo, and the continued concentration of industry in Kampala - but the prospects for a wider distribution of light, market oriented industry i.e. footloose industry, are very good and will be an important factor in promoting economic and political stability.

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- (4) N.B. This statement is based on information so far collected and may be revised in the light of future investigations.
 - (5) Such industry includes: miscellaneous food (except meat canning), soft drinks, footwear and wearing apparel, wood products and furniture, rubber and rubber products, soap, clay products and some metal and engineering industries.

Conclusion.

It should once again be emphasised that the results given above are only preliminary and the conclusions tentative, Both may have to be changed as more information comes to light.

Assuming the completed survey of industrial location in Uganda gives satisfactory data and results, It is hoped that it will be possible to generalise these findings to Kenya and Tanzania. Concentration will then be focused on the "common market based" industries in Kenya i.e. those industries requiring the whole of the East African market for efficient and profitable operation, in an attempt to determine more clearly their choice of Kenya as a location, and, if possible, to give an estimate of the cost differential between, for example, Nairobi and Kampala, placing special emphasis on an investigation into external economies in Nairobi.

In conclusion, it is worth remembering the words of Losch; "As a rule, however, no single factor can indicate a location. All influence it, many favour it but none determine it. Many reasons lie behind its choice." (6) This should always be kept in mind in a study of this kind.

(6) A. Losch, "The Economics of Location", p.35.

Appendix A.

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Questionnaire on Location of Industry in Uganda,

1. Name of Firm.

2. Location of Factory or Workshop.

Pistrict.

Town.

Street,

3. Description of Products (s).

4. Total Number of Employees.

less than 20 ()
20 - 49 { }
50 - 99 { }
over 100 { }

5. Location Factors in the Industry.

Please check those factors which were important in your location decision.

A.1. Access to markets.)
2. Anticipation of growth of markets.

B.1. Cost of transporting raw materials & other inputs.
2. Availability of raw materials.
3. Availability and/or cost of fuel and power.
4. Adequate supply & satisfactory type of water.

C.1. Adequate supplies of a. skilled labour
b. unskilled labour.

D.1. Availability of suitable site & other facilities.
2. Adequate sewage disposal facilities.
3. Proximity of other firms in the industry.

E.1. Community and housing facilities.
2. Banking, Insurance and other commercial facilities.
3- Availability of Capital.

F.1. Personal Factors e.g. nearness to home, etc.

G.1. Any other factors (please specify).

Which of the above do you consider the most important factors:

1.

7. If necessary, will it be possible to interview your Company? Yes/No.

8. Any other information you consider relevant.

Appendix B. Sector Breakdown of Number of Firms and Replies Received.

<u>I.S.I.C.</u>	<u>Description</u>	<u>Number</u>	<u>Replies.</u>
202/209	Miscellaneous Food	8	6
207/220	Sugar & Tobacco	1	1
213/214	Beverages	9	8
231/233/241/ 242/243/244	Textiles, Footwear & Wearing Apparel	6	4
271/280	Printing & Pulp and Paper	2	0
300	Rubber Products	1	1
311	Basic Industrial Chemicals	4	3
319	Soap & Other Chemical products	7	5
332/334/339	Glass, Cement & Other Mineral products	3	3
341/342/350/ 360/370	Metal Industries & Engineering	41	16
	Total	82	46

Appendix C. Co-efficients of Localisation in Uganda and England.'

1. Introduction.

Appendix C outlines an attempt made to give quantitative estimates of the degree of concentration or dispersion of industry in Uganda, using co-efficients of localisation.

2. A Note on the Co-efficient of Localisation.

The co-efficient of localisation is based on the deviation of the distribution of workers in various industries or in various areas from the distribution over the whole of industry or over the whole country.

Percentages are obtained for each industry, giving the proportion that industry employed in each of the regions (out of that industry's total employment), and this figure is compared to the percentage of all workers employed in that region.

If regional industry percentages do not deviate from those for industry as a whole in that region, there is no localisation, but if the deviation is high, the localisation is great.

The degree of localisation of any industry can thus be measured in one figure by the sum of the positive or negative deviations of its regional percentages from the corresponding regional percentages of industry as a whole. The totals of the positive and negative deviations will be equal, and to obtain the co-efficient, they are simply divided by 100.

This co-efficient was first used by P. Sargent Florence in the 1930's and has been used extensively since then, but, as far as the present writer knows, this is the first attempt to apply it to the location of industry in an underdeveloped country.

3° Co-efficients of Localisation for Uganda.

The localisation co-efficients are given in the following table along with roughly comparable figures for England.

The Uganda co-efficients, in general, follow the expected pattern. Low co-efficients (0.20 and less) are obtained for bakery products and confectionary, meat and fish, metal industries and engineering, rubber products, furniture and repair of motor vehicles. All these industries are distributed approximately in proportion to the total distribution of manufacturing employees.

In the group 0.21 - 0.30 we find grain milling, sugar, tobacco, printing and publishing and soap and other chemical products. These industries are less evenly distributed in relation to total manufacturing employees.

The industries with highest co-efficients are oils and fats (0.57), miscellaneous wood products (0.44), basic industrial chemicals (0.45) and textiles, footwear and wearing apparel (0.40).

The co-efficients are only of use when, one also examines

1. the nature of the product, and,
2. the structure of the industry.

For example, a high co-efficient was obtained for oils and fats because of the marked concentration of employees in this industry in the Eastern Region (93.8%) compared to the percentage of total manufacturing employees in this region (36.5%) • Structural Clay Products has a higher locational co-efficient than expected (given the nature of the final product) because of the high concentration of employment in this industry (89.4%) in Buganda.

4. Comparison of Ugandan and English Co-efficients.

No significant correlation exists between the two sets of co-efficients, a correlation co-efficient of 0.3 being obtained. This lack of correlation is due to several factors:

1. the co-efficient for any industry is more precise, the finer is the sub-division of areas. Uganda is only divided into four regions in the Survey of Industrial Production, 1963, and this does not allow the calculation of very precise co-efficients. (1)
2. the final products of the industries being compared vary a great deal e.g. "rubber products" in Uganda i.e. mainly tyre retreading, and "rubber" in England, the latter obviously including a far greater range of products.
3. Given the small number of manufacturing establishments in Uganda, the "incorrect" location of one major factory will produce a large variation in any one co-efficient. (A higher degree of correlation exists between England and Kenya where the number of manufacturing establishments is greater).

It will be seen that except for six industry groups (bakery products and confectionary, sugar, tobacco, soap and other chemical products, rubber products and metal industries and engineering) the Uganda co-efficients are higher than their English equivalents, indicating that industry is more concentrated in Uganda than it is in England.

5. Conclusion.

The exercise appears to be of limited value when comparisons are made with England, but it does give some indication of the location characteristics of different industries in Uganda. The co-efficients, in general, confirm the observations on industrial location contained in the paper, and it is thought that such an exercise is useful, even if results obtained are not very positive.

(1) P. Sargant Florence makes the point that where the sub-divisions used are regions, it may be better to speak of Co-efficients of Regionalisation. See: "The Logic of British and American Industry", p.39.

Comparison of Co-efficients of Localisation for Uganda and England.

Sector		Co-efficients	
Uganda	England	England	Uganda
1. Grain Milling	Grain Milling	0.17	0.24
2. Bakery Prods. & Confectionary	Bread & Flour Confectionary	0.13	0.08
3. Misc. Food Preparations	Milk Products Preserved Fruit Misc. Preserved Food	0.16 0.15 0.22 Av.	0.18 0.31
4. Sugar	Sugar & Glucose	0.42	0.25
5. Tobacco	Tobacco	0.36	0.29
6. Beverages	Brewing & Malting Soft Drinks	0.12 0.11 Av.	0.11 0.36
7. Sawmilling & Plywood	Timber	0.08	0.31
8. Misc. Wood Prods.	Wooden Containers, etc.	0.22	0.44
9. Furniture	Soft Furnishings Furniture & Upholstory	0.18 0.21 Av.	0.19 0.20
10. Printing & Publishing	Printing & Publishing	0.17	0.28
11. Soap & other Chemical Prods.	Soap, Candles & Glycerine	0.41	0.24
12. Rubber Products	Rubber	0.33	0.18
13. Basic Industrial Chemicals	Plastic Goods Chemicals - General Fertilizers	0.27 0.33 0.27 Av.	0.29 0.45
14. Structural Clay Products	Brick & Fireclay	0.23	0.34
15. Glass, Cement & Concrete Prods.	Building Materials Cement	0.09 0.39 Av.	0.30 0.36
16. Oil & Fats	Seed Crushing	0.45	0.57
17. Metal Industries & Engineering	Mechanical Engineering - General Mechanical Engineering - Repair Electrical Engineering Non-Ferrous Metals Chain, Nail, etc. Hardware, Hollow ware, etc	0.14 0.09 0.27 0.40 0.52 0.27 Av.	0.26 0.11
18. Repair of Motor Vehicles	Motor Vehicles, etc. Repairing	0.08	0.20
19. Meat & Fish Industry			0.08
20. Textiles, Footwear & Wearing Apparel			0.40

Source: Figures for England obtained from R.J. Nicholson, "The Regional Location of Industry: An Empirical Study based on the Regional Tables of the 1948 Census of Production", Economic Journal, 1956.

Uganda: Census of Industrial Production, 1963. I would like to thank Dr. L. Schnittger for his assistance in obtaining a more detailed breakdown of statistics for Uganda.

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