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URBAN AND REGIONAL PLANNING
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CRITERIA FOR LOCATION OF INDUSTRIES IN RURAL SETTLEMENTS:

A case study of Kirinyaga District.

A Thesis Project submitted in Partial fulfilment of requirement for an M.A. in Urban and Regional Planning.

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ABSTRACT.

Looking at the criteria used for designating service centres in Kirinyaga District, Kenya, it will be noticed that it has included not only centrality but also aspects of potential for growth, especially raw materials and industry supporting infra-structure. At the lower levels of centres however, i.e. urban centres and below, it does appear that service to the surrounding area takes precedence over growth. In fact, such centres have been refered to as "service" centres rather than "growth" centres in physical development plans. The findings of the present study indicate that industrial growth aspects in these centres have been left to chance. Industrial spaces found in them do not seem to be based on a co-ordinated assessment of their respective potential in activity levels, and in some cases, industiral growth potential seems to correspond only coincidentally with service level potential.

It has however, been found that development of central places is closely related to the levels of industrial activity. In the first instance they are both aspects of development of urban agglomerations, both depending on similar resources of manpower, finances, materials and land availability. Secondly, they supplement one another as in cases where the sitting of one or two factories has given rise to setlletment forces of sufficient magnitude to be designated urban- or where convergence of human activities has generated forces of attraction for more activities to locate there - especially repair and servicing activities. Hence, while industrialisation generates growth and development, cumulative activity attraction causes more growth at a designated point. Both processes are actually urbanisation processes, each supporting the other.

Inspite of this linkage, sufficient consideration does not appear

to have been given to the interdependence in matters of siting activities and locating centres, especially in :-

(a) Differentation of centres (i) which have industrial potential and (ii) which have service potential only. This differentiation is clear at levels above the urban centre.

(b) Space allocation for industrial development where this interdependence may be utilised to the growth benefits of both settlments and industries of whichever level.

This involves selection of specific areas for industrial development where costs on both infra-structure and extension services would be minimised, and areas which enhance chances of growth and development. On this basis areas with industrial growth potential have been delineated and suggestions made on the nature and level of activities likely to thrive in these areas. The three areas identified, viz. Kerugoya/Kutus, Sagana and Wanguru emphasise the linkage between centre services and its potential for industry as related to possibilities for growth. The missing link in this respect is the co-ordination of space availability for industry in these areas and existing potential- co-ordination between activities to be aided and where such space is available and growth is possible- and lack of realisation that spatial requirements for industry should be more related to industrial potential than to rank of service centre in the hierachy.

Arising from this need for co-ordinated industrial location and designation of centres, it has been concluded that the current approach to rural industrialisation is not the most suitable for reaching increasingly smaller settlements with assistance and provision of industrial space. This is so particularly with reference to extension service costs viewed against the response so far achieved, and

the centralised nature of rural industrial development centres. It has therefore been suggested that a method of ranking industrial activities to correspond with the ranking of service centres, and which would allow for ranking of intrastructural and land resources similarly, would be more suited to dispersal of rural industrial development. It would then be possible to relate the requirements of machinery, finance, and technical services to the levels of activities found (or recommended) in various levels of urban development and so avoid machinery and services which activity levels tend to under - utilise.

To achieve this, a framework of industrial groups which utilise less sophisticated common services such as communal machinery, storage and bulk purchase, has been suggested. The intensity and sophistication of these communal services should relate both to level of centre and potential for industrial growth of such a centre.

To sum up, industrial services should be given in relation to industrial growth potential and the hierachy of centres, both of which should be reflected in the amount of industrial space and resources to be made available. All this should be done within a restructured framework for rural industrialisation.

1. INTRODUCTION

1:1 HYPOTHESIS.

1:1:1: STATEMENT OF OBJECTIVES

It has been realised since the days of "laissez faire" economies, that economic development is slow and fraught with undesirable consequences if left to itself. These consequences arise out of comparison with what should be a norm for other areas where the situation is more acceptable. Some of these consequences include unequal spatial development, inefficient and wanton utilisation of resources and general deterioration of human environment and resource base. Organised state guidance has therefore been invoked as one of the means by which development could be directed to avoid or minimise the undesirable consequences and create a relatively acceptable situation.

In developing countries, guidance is used more as an initiating and innovative process rather than the corrective tool of developed countries- it draws on the experience of the latter in matters of similar development approach such as agriculture, industries, community welfare etc. An important area of economic development of common interest has been identified as the contribution of industries towards overall economic growth and development, particulary small industries. The latter have shown capability for adapting to small centres in the vast environment of developing countries. The measures taken vary from country to country (1) In Kenya, efforts towards deconcentration and widespread industrialisation have involved deliberate state action towards support, guidance and expansion through a formalised rural industrial programme. What is not equally emphasised is the spatial form and consequences on spatial patterns arising from rural industrialisation. The settlement pattern on which the industrialisation process finds spatial reflection is based on previously existing agriculturally

based economic system. Industrialisation, besides introducing new consumer goods and services, would have certain spatial effects arising from locational requirements and agglomerative influences.

The thesis examines these spatial effects in a rural setting with the object of finding out space demands by which rural industrialisation efforts could be farther assisted. It is realised that these efforts overcome a large variety of obstacles, some of which are not related to space, but are treated here for the sake of completeness. However, all human activities find their foundation in space, and for this reason the interaction of settlement patterns and industrial activities is of importance to the success of the latter.

Rural industrialisation has been deliberately encouraged in Kenya for the past five years or so, with the objectives of spreading the multiplier benefits of employment and higher incomes to rural areas and assisting to raise rural welfare standards. Parallel efforts with the aim of generating higher welfare services for rural communities are being made through selection of certain centres of human concentrations and pinpointing them for certain levels of servces. The importance of linking these two as supplementary facets for improved benefits in rural areas is genuine. The study attempts to find methods of making such efforts collaborative as it is felt that no genuine links exist at the moment between the choice of service centres and the location of small-scale industrial activities.

Part of this study would therefore provide some criteria for choice of location within the area studied. The other part seeks to establish which quantitative and qualitative aspects of rural constraints tend to limit the effectiveness of the chosen tool of rural industrialisation for development in a rural perspective. These limitations are dealt with here from the point of view of rural spatial consequences. It is hoped that the location criteria would be capable of reapplication in areas with

similar conditions.

Location as a fundamental element of industrial programmes has been emphasised recently, particularly for the developing countries, by both national and international organisations. (2) To quote an example of the latter, The United Nations Seminar on Industrial Estates In Africa meeting in Addis Ababa in 1965, had this to say on location:-

> "One of the most important factors contributing to success or failure of industrial estates is its physical location. It is vital therefore, that any broad siting decisions should be made in the light of national and regional planning policies."

This clearly underscores the necessity of taking advantage of the complementarity of physical and economic efforts which forms the underlying theme of the thesis.

It has therefore been assumed that some definite spatial influence would emanate from the economic effects of rural industrialisation. Such an influence would set definite forces in motion within a settlement framework originating from a different set of economic forces. This new influence would have specific locational consequences on both rural activities and settlements. Consequently demand for space and economic demand structure would be altered to face up to the new activity systems, and ultimately deserve re-allocation of resources in terms of land, manpower and infra-structure.

1:1:2 REVIEW OF RELATED LITERATURE

Being a relatively recent approach to improvement of the lot for the rural communities, rural industrialisation has provoked a lot of interest. The greater part of this interest has followed the lines of

of evolving a framework of infrastructural network, financial institutions and implementation machinery necessary for the programme.

A series of evaluative papers have been written by the Institute for Development Research in Cophenhagen. (3) These project papers basically deal with the Rural Industrialisation Programme as a tool for bringing industrial activities within the rural areas. In particular, they asses the justification of using the Programme as an "extension Service Programme" which would give selected clients a 'package" of advice on certain identified problem areas such as in skills, management and organisation, product improvement and marketing. They have identified what they have called "The Free Field Assistance" which consists of individualised advice to a client at his place of work. This advice is individualised in the sense that it deals with the specific problems affecting a specific individual. The research has concluded that this mode of advice tends to be more expensive, particularly relative to the complementary form of assistance, ... and the relatively low response rate from those advised. The second form of assistance identified, they have called "Free Centre Assistance" which consists of training in technical work and advice at the Rural Industrial Development Centre. This form of assistance is more tangible and covers several individuals at a time. It is concluded to be less package in nature, cheaper, more tangible and relatively more effective in terms of skills accepted and the total number reached at a lower cost.

These evaluative papers have however not dealt with two important aspects of rural industrialisation. Firstly, the network of small activities which are not directly assisted by the R.I.D.P., and other large firms which do not benefit from the Programme, but then are part and parcel of the rural industrialisation efforts. These are parallel, if not supplementary, activities which have been in existence and would continue

to be, effective in tapping the rural resources of capital, manpower and raw materials apart from the Programme. Secondly, these researches have tended to asses the programme on the basis of its implementation machinery i.e. from the point of view of Rural Industrial Development Centres and the expenditure on the Programme, and have taken for granted (or have tended to) the basic acceptability of the programme and availability of the raw material base. In other words they have disregarded the receiving end and the structures of raw materials and supporting factors required. It is taken to be of equal importance in the evaluation process to asses the object of the Programme - the receiver, and also the resources available to him before concluding on the effectiness of the efforts.

Parallel surveys have been carried out by the Institute For Development Studies in Nairobi University, particularly by F.C. Child, (4). These also have concentrated on the Clients of the Rural Industrial Development Centre, specifically in Machakos, Embu, Nyeri and Kakamega. The emphasis in these papers is on the bottlenecks to the development of "assisted" small scale industry and the alternatives available for the approach. Child has reached certain conclusions, such as the necessity to emphasise on less sophisticated techniques in favour of more labour intensive techniques and gradual introduction of new techniques. He has also reached conclusions which support continuation of the Programme due to its employment creating capacity, alleviation of unemployment and rural - urban drift, higher rates of return on capital invested and the fact that wages compare favourably to those found in urban areas. He has made recommendations on removal of discriminative legal impediments, supply of services such as power, water and roads, improved management practice and intensification of extension services. He differs on the latter from the paper of the Institute for Development Research on the

nature of extension services to be intensified, for I.D.R. recommends intensification of seemingly intangible individualised assistance. It is notable that Child has not mentioned locational factors or space availability as a hindrance, except as related to legal requirements for industrial structures.

Another paper from the I.D.S. (5) on the same subject deals with the selection criteria between small and large industry as an instrument for maximising returns and achieving substitution. This paper by L.P. Mureithi, concludes that the choice between large and small scale industries could be used as a policy strategy, and implies that small-scale industries have an advantage over larger ones on the returns on capital. The fact that small-scale industries do not seem to be very popular inspite of this may be explained by other reasons such as that they are not prestigeous, opportunities are fraught with restrictions and space for them less available- all of which Mureithi has not considered.

Locational aspects of industries on the national and regional scale have been studied by R.B. Ogendo (6) who has arrived at certain conclusions on locational considerations, sizes of industrial activity and factors influencing development of industries at these levels. He has specifically concluded that factors which influence location may be summarised as follows (7):-

" (a) Historical, geolo-topographical and ecological influences.
(b) A combination of processing and transfer costs - the transport costs of product and raw materials.
(c) Influence of personal considerations and their interaction with governmental stragegy on location.
(d) The influence of spatial pattern of infrastructural facilities and markets.
(e) The influence of economies of aggromeration and/or industrial linkage."

In the context of this study, it is found that factor (c) above functions in Kenya at the regional level only while the strategy is not discernable at district level. In fact the emphasis has been, probably for lack of sufficiently large enterprises in rural areas, on the urban areas which form the corridors of industrial development. Although Ogendo throws a lot of light on the industrial configuration of major centres, deserved emphasis has not been laid on the rural aspects of industrialisation. (8) There is also a tendency to treat the settlement pattern as given.

The other papers discussed do not even give any consideration to spatial factors which either affect the settlement pattern and are affected by it. In a developing country whose settlement pattern is fast evolving, new locational decisions may have strong influence on settlement locations. Examples are Webuye Town in Western Kenya, where location of a paper mill has given rise to a new township. Similarly, location of a rice mill and a ginnery at Wanguru, along with establishment of Mwea Rice Irrigation Scheme has resulted in a new thriving Community. These examples illustrate that not only to agglomerative forces of an existing centre attract more activity, but that new location decisions also influence the choice of new centres. This co-relation has not been dealt with at the level of the planning unit in Kenya, (the district).

Other foreign sources of related information have been the work of of P.C. Alexander (1961)(9), who has treated industrial estates programmes in India from the national point of view of efforts towards rural industrialisation. The similarity of India's approach to Kenya's efforts is very apparent in his book. India's programme is however much larger than Kenya's. Although he has treated the linkage of the programme to the settlement pattern, he has shown that the programme

concentrates on industrial estates in larger centres and much less on small villages and cottage industries. In fact, the level of centre treated as urban, with over 50,000 people, is far larger than Kenya's urban level of over 2,000 people. In Alexander's book, village crafts, and artisan trades have been included as recommendations for further action. At present, this aspect of industrialisation is undertaken as community development work. (10) Alexander has recommended a shift of emphasis from formalised industrial estates in larger centres, and that these should be privately developed, so that greater public efforts could be directed to smaller centres. His assessment does not however survey locational requirements for activities outside industrial estates programme and within small centres.

Finally is the work of the Physical Planning Department in creating a balanced regional framework of settlements. To arrive at the decision to designate a centre at one or the other level, the following factors are considered:

(a) The functional relationship of the centre and the rural area in which it is situated. This often coincides with administrative hierachies, giving some recognition to the relationship between decision making and settlement systems. However, government agencies have not decongralised to the same level and some decisions are made at more centralised levels than others.

Among infrastructure given weight in this designation scheme; power availability, postal and telephone, water sewerage and

transportation are of direct effect to industrialisation. Other services e.g. administrative, schools, health etc. have only indirect influence on industrialisation. These have nevertheless featured prominently in the choice of service and growth centres. This shows that the centres, particularly the lower levels of them, are picked out for service to the community rather than industrial growth- a point that may be taken to indicate lack of consideration for rural industrialisation as one of the motives for the choice of centres.

(b) The second aspect considered in the selection of service and growth centres is the potential growth of the area in which they are located (particularly agricultural potential), the total existing population to patronise the services and the potential population based on agricultural potential. Alongside those factors is also the physical distance between the existing centres, which implies consideration of the physical locations of the centre in relationship to other existing centres.

This aspect utilises basically the same facts, if added to the consideration of infrastructure directly relevant to industry, as those utilised to decide on possible locations for industry. Although, the choice of centres may not have followed rural industrialisation as a foremost objective, this concurrence on the common factors for location tends to informally relate the two parallel approaches to decentrlisation.

The work of the Department of Physicsl Planning is published in six Provincial Physical Plans for the Provinces of Kenya, and the National Development plans 1970-74 and 1975-78 which set out the settlement strategy for the whole country. Among the Districts considered is Kirinyaga.

1:1:3. BASIC ASSUMP IONS.

To achieve the objectives discussed above, (see 1:1:1), the study has had to take certain situations and conditions for granted. Some of these are derived from natural phenomena and therefore are unchangeable, and some are specifically important to the framework within which the industrial sector forms an essential part.

1. Physical Structure

It has been assumed that the physical form of Kirinyaga District would remain unchanged, both in size and configuration. This implies that the planning unit, which is here based on administrative boundaries, would remain constant along with the location of administrative headquarters at Kerugoya. Relief and climatic conditions are also assumed to remain unchanged. The character of the soils as a source of raw materials is also assumed to remain good for crop and animal husbandry as this has largely given the district the settlement form now existing. No major drainage diversions would occur to alter the basic development pattern in the district. In general terms, the economic consequences of topography and other physical forms would remain constant.

2. Economic Structure:

The free enterprise economic policy would continue to be upheld and the government would continue to emphasise development of rural areas and communities. This presupposes continued attempts to reverse the tendency of the economy to concentrate on investments in core areas and achievement of distributive effects. The whole industrialisation programme is founded on this principle, and changed emphasis would render the basis of this study rendundant.

Except where changes would occur for the general betterment of the situation, it has been assumed that the legal basis for the economic structure would remain the same. No major changes for the worse are anticipated in the licensing methods nor are changes anticipated in taxation principles although the methods may change. This is necessary to ensure that no further opportunity restrictions would occur and that firm incomes potential would remain similar in the future. Further no major changes in overhead and recurrent costs of firms are anticipated.

Space acquisition procedures, as for instance, the probability of procuring industrial plots are assumed to remain the same, and the basic forms of land ownership. The legal restrictions on development such as planning laws and local authority by - laws on matters of construction standards, locational and health requirements are assumed to be unchanged.

3. Social Structure:

The fundamental ehtnic configuration of population from which district ethnic uniformity is derived would have to remain basically the same. Hence the basic tendency for males to temporarily migrate in search of employment, while remaining socially attached to their home origins, would remain the same into the foreseable future. That for some while, the males will dominate, (with all due respect to women liberation efforts) the wage earning spectrum and continue to show greater venturing courage in enterepreneurship.

To afford some reliability to manpower estimates, it has been assumed that no dramatic changes would occur in the education enrollment and no abnormal interest would be shown in the apprentiship fields at least in the short run.

Finally, it has been assumed that the population would continue to

grow at normal rates and no major increase or decrease in the rate of growth would occur. Alongside this assumption is one, that the system of land succession and consequently the level of displacement would remain reasonable. The rate of displacement may accelerate with maturing generations- not out of abrupt tenure changes- but following from the normal course of economic and legal forces.

These assumptions form the basis for the arguments tendered on the following pages. Where it has not been found possible to put forward an assumption of general application, such special assumption is stated within the text. The total set of assumptions is the skeleton on which the thesis aruguments, findings conclusions and recommendations get support. Their removal would reduce it to nought. This is said with confidence as a situation of constantly changing functions can not be comprehended by real world relationships. Holding certain functions constant enables us to visualise the likely changes resulting from varying others. It is then possible to roughly forecast the changes to the settlement pattern arising from injection of industrial activity, and hopefully guide the total system in a predetermined direction.

In many systems, the functions to be varied and to what extent is often not clearly defined although the direction is susually defined well. For this reason, the planning process has evolved a system of cross-checking proposals, assessment of alternatives and the evaluation of feasibility attempted in this study.

1:1:4. DEFINITION OF TERMS

Intermediate Sector: This term is applied here to mean, that group of processing and manufacturing enterprises which largely utilise local raw materials or re-use initially discarded products of other

manufactures. Materials may be originally imported such as tin and sheet metal, scrap metal, plastic, rubber, wood etc. This sector is distinguished by production of consumer goods and services as opposed to capital goods and primary production. In rural areas, this sector includes largely small scale enterprises.

Manpower: This term has been used in two senses, depending on specific context. First in the broader sense of the numbers of personnel capable of being utilised for productive employment, and from available sources such as the education system. Secondly, more strictly to mean personnel requirements for small scale industry. It is this way distinguished from "labour force" which is taken to imply personnel actually employed at a point in time, and which may not imply training potential or possibility.

"Centre": In terms of human settlements or agglomerations of human activities, refers to an area at which the surrounding community obtains any level and nature of goods and services. At the district level, it is distinguished from the growth pole (somewhat in the manner used by the Department of Physicsl Planning). While the growth pole is expected to effect growth, the service centre, although capable of limited growth is expected to play the role of uplifting rural welfare. It is in this latter role that small industries are expected to supplement the service role of centres in Kirinyaga District.

Industrial Cluster: This term is conventionally used to mean a group of items located at a point on the ground and having similar characteristics. In this study however, it has been used to mean a group of activities, not necessarily performing similar or related functions, but having similar characteristics in magnitude and industrial undertaking. In this sense, it could be used interchangeably with a 'a collection of activities'

Industrial Assistance and assisted activities:

These terms are conventionally used to mean activities which use products of other activities in their processes, which implies complex relationships. In this study, the term does not take this economic interpretation, but rather means government aid or aided activities. Hence un-assisted activities are those currently not receiving government aid.

1:1:5. METHODOLOGY:

Information which has been utilised to evaluate the achievement of rural industrialisation programme has been obtained mainly from reports and data of the Institute for Development Studies Kenya, and the Danish Institute for Development Research. In many respects, these reports and publications are seen in the background of the information the author has physically gathered from the field: On one hand, a stratified sample of activities selected from the register of small industry register in the district. A 30% sample of this was interviewed by taking every third activity from at least two urban, two rural, four market and six local centres. This latter selection covered fourteen of 42 centres in the district, about 33%. The percentage was however much higher for the larger centres and represents 66% of urban, 66% of rural and 45% of market, and only 23% local centres.

Official published information has also been obtained for National Development Plans, supplemented by district reports and interviews with government field officers. These sources have given basic notions behind decision to industrialise rural areas, goals, objectives and the stragegy of the policy decisions taken. Secondly activity levels and types, and their relationship to settlements have been observed from field surveys. These have been tabulated and related to the schedule of

designated centres prepared by the Physical Planning Department, It helps in identifying areas which accommodate certain types of industries. with the information on location obtained from the sample survey selected as stated above, it is seen as sufficient basis for identifying areas of industrial potential. The activity sample may not be sufficiently representative of all activities, but the centres existing in the district are well covered. This information has been utilised to compare with the findings of similar previous evaluative reports, and at least find information on possible desired locations.

The third area covered by the Thesis is an analysis of the factors which are assumed to be capable of influencing decisions to locate activities in specific areas. Information on these factors has been obtained from organisations dealing with their development e.g. the Post Office agencies, the East African Power and lighting Company, the Water Development Ministry and the Ministry of Agriculture, specifically their district level offices. This is done to find out areas which may have favourable conditions for location of industries and which may or may not have enterprises located in them.

The three sources of information is expected to give a sufficient basis for determining:

(a) The applicability of rural industrialisation programme to a rural environment and its likely limitations which are not of physical nature.

(b) The way in which this programme may be related to the settlement pattern, where possible, the type and level of activity as related to levels of service centres.

(c) The areas where the functional relationship between spatial locations of industries and settlements could possibly result in enhanced chances of success.

1:1:6 STRUCTURE OI STUDY

This Thesis has been divided into three parts which roughly conform to the methodlogy followed:

The First Part deals with background information. It relates the subject to both National Policy and comparative policies of other countries; in a way giving the reader the national background to rural industrialisation and its objectives. It also gives some indication of the rationality for rural industrialisation in a conceptualised manner, and the relevance of small scale industry in achieving the objectives of the national goals.

This part narrows the subject down in the Second Chapter, focussing more on the district studied, specifically dealing with the peculiar characteristics which give the district its physical, social and economic form. Towards the end of this part, and following on social characteristics, this part gives an indication of the nature and composition of manpower available in the district which, being a locational determinant, provides a linkage with the part that follows.

Part Two analyses factors which have relevance in determining the location of activities, breaking them into those relating to raw materials and those relating to infrastructure in two respective chapters. These have been analysed both in terms of their quantifiable aspects like levels of output, and their non-quantifiable aspects like where they appear to have influenced location decisions. It has also been possible to attempt a categorisation of activities according to their levels and according to the way they appear to be influenced or otherwise uninfluenced by specific location determinants. This has enabled a synthesis to be done which provides the base for a location pattern.

The Third Part deals basically with the synthesis of the policy

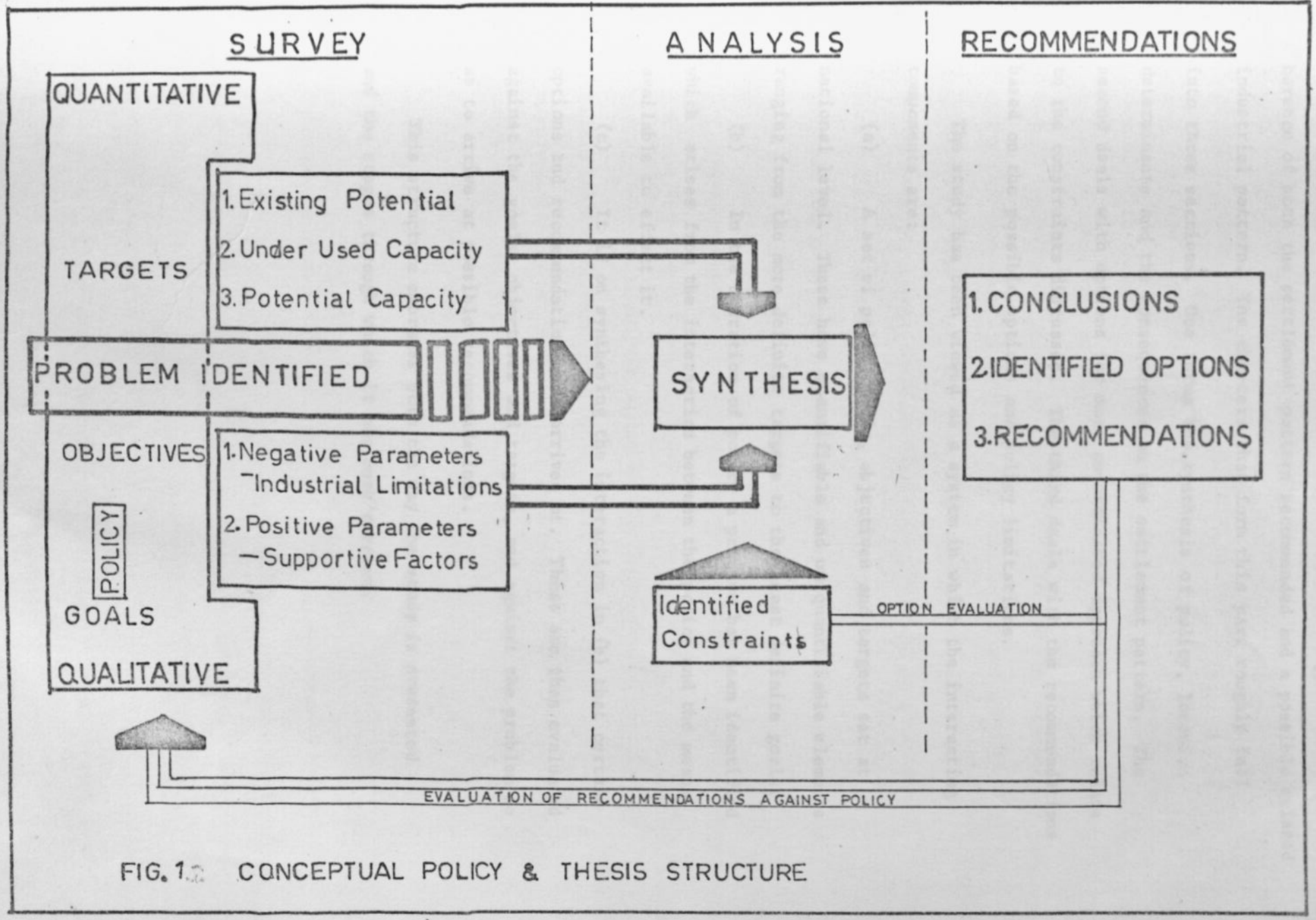


FIG. 1.2 CONCEPTUAL POLICY & THESIS STRUCTURE

and locational determinants so as to arrive at conclusions on the coherence of both the settlement pattern recommended and a possible related industrial pattern. The chapters that form this part roughly fall into three sections. One forms the synthesis of policy, location determinants and the consequences on the settlement pattern. The second deals with options for more co-ordinated approach which relate to the constraints discussed. The third deals with the recommendations based on the possible options and policy limitations.

The study has been viewed as a system in which the interacting components are:

(a) A set of policy goals, objectives and targets set at national level. These have quantifiable and un quantifiable elements ranging from the more definite targets to the least definite goals.

(b) In the operation of policy a problem has been identified which arises from the interaction between the policy and the means available to effect it.

(c) It is on synthesing the interaction in (b) that certain options and recommendations are arrived at. These are then evaluated against the goals, objectives and targets, and against the problem so as to arrive at possible recommendations.

This structure embraces both the way the study is presented and the stages through which it has been carried.

1.2. KENYA NATIONAL BACKGROUND

1:2:1:0. RURAL INDUSTRIALISATION POLICY IN KENYA

Kenya has approached rural industrialisation in two basic ways, both of which recognise an intermediate sector as part of the total economic system. The two approaches reconise the impact of agglomeration of the elements within the economic system on the organisation and policy formulation. The exchange of technological and developmental information takes place partly through sectoral channels from a centralised source, either formally through governmental agencies and mass media, or informally through entrepreneural contact (13). On the one hand the government participates and on the other economic system is geared to encouraging entrepreneural talent.

Existing channels of transmission of non-formal information are inadequate for initiating innovation in small industry. Non-conventional information sources depend on the capacity of a community to effect innovation, and the lack of latent entrepreneurship would result in hardly any developmental investment. Kenya has therefore deliberately intervened to dislodge and uplift existing entrepreneural talent to bring about accelerated investment in new ventres. One basic assumption of Kenya Industrial Policy is existence of latent interest in investment. (14)

The basic objectives of the state agencies charged with rural industrialisation are, providing information on improved managerial and technological skills and opening up new investment opportunities. Part of the problem which this approach assumes is the inadequacy of the informal transmission of information in effecting development of small industries. Field agencies attempting to remove this constraint have found that only tangible aspects of their assistance, such as additional

finance, land or premi es and practical training, appeal to entrepreneurs (15). Intangible forms of assistance, such as product improvment, better marketing methods and organisation of firms, whose results are relatively long term, tend to be less appealing to entrepreneurs, especially when given at their place of business (16).

Finally, the policy recognises the important role that small industry can play in achieving the objectives of equitable distribution and economic diversity in rural areas. This assumption places in perpective the impact of rural industrialisation in the national economy and relies for its realisation on making investors widely aware of opportunities available for investment in all sectors of the economy. The present lack of diversity points out that there is lack of comprehension of available opportunities. Since returns on capital and lower initial costs show that small industries compare well with other investments, (17) it seems then, that lack of prestige and ignorance tend to constrain investments in this sector. The policy stragegy adapted is partly removal of this ignorance by making information on opportunities available. The survey of existing firms shows that demand for goods and services exists in Kirinyaga District, but space for these activities is limited.

Secondly, rural industrial assistance has involved the creation of a system of incentives which will have lasting effects on the firm. The system includes centrally run loan schemes, serviced and developed industrial estates, and industrial sheds. In some cases managment advice, purchasing and marketing assistance is given within the industrial estate. (18) Although this approach is a decentralisation process, it covers areas which are not rural by Kenyan standards i.e. Mombasa, Nakuru, Kisumu, Eldoret and Nyeri. Hence, the industrial estate programme is actually a concentrated decentralisation approach to

industrialisation and not strictly rural programme. It is geared to achieving economies of scale, capital formation and the creation of an industrial environment to attract further investment (19). The effect is long term, and the success of the programme in this respect cannot yet be evaluated.

These two are the approaches followed by Kenya to disperse industrial investment for the benefit of other areas autside major towns. The actual policy may be found in the three Kenya National Development Plan viz. 1964-69, 1970-74, and 1974-78. The policy emphasises increased efforts towards rural locations, with special assistance to areas which the colonial administration ignored. This strategy is intended to correct the imbalances created by the colonial investments policy. It is also meant to assist in retaining some of the rural population in rural areas by creation of diversified employment opportunities, and alleviating rural-urban drift (20). The realisation that the large industry sector does not provide sufficient additional employment opportunities underscores the logic of this strategy. Further, the strategy would benefit smaller investors whose capital raising capability is low, and whose low orgnisational competence befits the small firms (21). No policy limitation on expansion exists, although the implication is that, as the firm expands, the form of assistance, and the assisting agency may change. There is also no policy differentiation between industrial activities and crafts, except in the nature and level of assistance given (22). Both are equally admissible to the assisting agencies so long as the projects are shown to be viable. Assisting agencies are however differentiated for small, medium and large - scale industry.

Registration of firms presents no special difficulty. Interviews with field officials and entrepreneurs revealed that industrial

activities are registered easily at payment of a fee of 40/= (Registration of Businesses Act, Cap. 499 Laws of Kenya). Operation licence is however more difficult to obtain and has to be secured annually. It is at this stage where the Public Health Act requires standard industrial premises and satisfactory site service (23). It is assumed that it puts a limitation on the number of entrepreneurs who would otherwise set up firms. Firms which do not satisfy these health requirements are licenced on temporary basis, and their annual fee may often bear no relationship to their output (24). Such enterprises are chiefly those starting production with low capital and often small ones. Hence, the system of licencing discriminates against beginners. Licencing has been challenged elsewhere (25) on the grounds that it limits the whole economy, but then this involves the objective of localisation of the means of production and therefore differs from the argument tendered here. Licencing at the local level does not consider the viability of the project, nor does it guarantee any form of assistance- financing agencies do this. It has remained a method of revenue collection which the non-discriminatory registration would equally well serve. It does have a repulsive effect on beginners, while evidence of the premises they require shows that demand for robust industrial premises is not justified. Those interviewed indicated that it is partial in nature and excludes some of the potential entrepreneurs (26).

Availability of industrial space is an equally important constraint to initiating small scale industry. A survey of small scale industry by F.C. Child (27) revealed that enterprises in temporary premises are in constant fear of displacement and need for alternative premises. A similar conclusion was reached by the author through his observations in Karatina and Nyeri towns and also in Kirinyaga District. 30% of enterprises interviewed occupied temporary premises, 45% functioned in

open air and only 14% occupied officially recognised industrial sites and buildings. Although no information on potential firms was available, lack of secure space was mentioned as a problem by all enterprises which functioned either in open air or temporary premises. The latter were often sub-tenants on land not specifically zoned for industry.

Evaluation of special Rural Development Programme in 1975 showed that clients of R.I.D.C. complained mainly of lack of machines and tools, lack of space and raw materials. Comparative figures from the author's survey are shown on Table I below.

Problem	RIDC Clients %	Kirinyaga All enterprises %	No.
Plots and Premises	13	30	49
Raw Materials	15	8	10
Production Methods	10	5	6
Tools and Machines	32	45	59
Electricity	6	5	6
Book Keeping	5	3	4
Marketing	5	3	3
Unknown	12	-	

Table I: Problems facing entrepreneurs

Source: S.R.D.P. Evaluation Report 1975, and Own Survey.

The difference is explained by the fact that R.I.D.C. clients are generally better accommodated and financially better off than other entrepreneurs.

Three of the common problems, viz. tools and machines, power and book keeping are within the scope of R.I.D.C. assistance. Plots, and premises, and raw materials are partly a reflection of location, but the former can be solved by provision of adequate space. This is the combined responsibility of the country council and the Department of Physical Planning. The prevalence of seemingly determined enterprises on unauthorised spaces, trade centres, on roadsides, backyards and open spaces is evidence of this demand for space.

This makes nonsence of legal demands on standardised premises.

The foregoing is a summary of the basic ingredients of rural industrialisation policy and certain salient aspects of its implementation. Attempts have been made to point out where strategy seems to fall short of the objectives and the sources of some of the inconsistences. What follows is a brief examination of the machinery for implementation of this policy.

1:2:1:1. IMPLEMENTATION INSTRUMENTS

Goals	Objectives	Strategy
1. Stabilisation of national economic base	1. To raise national per capita income	1. Increasing state participation in industry
2. Acceleration of manufacturing	2. To achieve greater equity	2. Increasing government assistance to firms
3. Raising rate of economic growth	3. To effect product substitution	3. Encouragement initiative
4. Location of means of production	4. To Praise the level of community	
	5. To Kenyanise ownership	4. Choice of location to realise economies.
	6. To diversity means of production	5. Utilisation of local resources.
	7. To raise added value in manufacturing	6. Decentralisation of investment.

Table 2: Industrial policy elements in Kenya.
Source: Kenya National Development plans 1970-74, 1974-78.

The two prong approach to rural industrialisation becomes much more clear when one considers the way this policy is implemented in Kenya. Both approaches reflect the national policy on encouragement of development efforts, urban and rural, whose salient features are shown on Table 2, below. This illustrates government participation on the one hand and individual initiatiative on the other. Individual initiative is dependent on the aggressiveness of would-be entrepreneurs, which depends on the state of information diffusion and availability of opportunities for investment. The limitations of

meagre privately raised finances, privately acquired skills and low organisitional competence affect this strategy more than others (28) Further, licencing and non-availability of space are repellant constraints to the intending individual entrepreneurs (29). The sudden increase of enterprises between 1965 and 1970 occured before the government started assisting small scale industry (30) and shows that lack of opportunity and space are stronger limitations than those mentioned above. Constraints on individual initiative have necessitated increased government participation in rural industrialisation.

Recently, the government has adapted a more active strategy involving direct participation by way of partinerships and indirectly by way of giving financial and technical assistance to entrepreneurs.(31). Success of this strategy depends on the level of latent entrepreneurs; of the talent and the acceptability by entrepreneurs of the available projects. Among the ongoing firms, this strategy is of great value as it gives the entrepreneur a source of support in managerial, and out of financial difficulties. It also gives the entrepreneur a means of acquiring needed skills. To the new firm, the strategy is of little value, particularly to small scale firms. Formalised assistance shows a bias for credit-worthy and better established businesses. Since individual initiative is slow in achieving a sufficiently fast rate of development, it is unreasonable to encourage ongoing firms only without creating further opportunities for new firms at the same time. The two face different bottlenecks. While ongoing enterprises mainly suffer from finance and skills, new and potential firms suffer from lack of opportunity and space (32). This differentiation has been found necessary to illustrate that both sets of firms require different modes of assistance. The existing implementation machinery does not make this differentiation. Enterprise selection methods subject all

types of firms to the same tests of viability, credit - worthness, licencing and health requirements if assistance has to be given (33).

The history of government assistance to industrial development dates back to 1944 when the East African Industrial Management Corporation was formed. This body was charged with supplying certain essential products during and after the Second World War. Its functions were taken over by the Industrial Development Corporation which was established by the Industrial Development Ordiance of 1954. The I.D.C. was charged with a wide range of duties, covering both industrial and commercial activities. Its terms of reference gave this body authority to:-

> "facilitate the industrial and economic development of the colony, by initiation, assistance and expansion of industrial, commercial or other undertakings or enterprises in the colony or elsewhere" (34).

By 1960, this body had no permanent staff, had received little financial allocation and concentrated investment in larger centres (35). The Kenya Government has established the Industrial and Commercial Development Corporation to take over the functions of the I.D.C. The I.C.D.C. has a permanent establishment, higher financial allocation and covers a wider range of activities. Under the I.C.D.C. the Kenya Industrial Estates and the Rural Industrial Development Programme are organised. The Rural Industrial Development Programme is designed to reach individual entrepreneurs through a system of Rural Industrial Development centres. These provide financial assistance through low rate loan schemes, technical training and management advice. Their performance is discussed below.

The Kenya Industrial Estates programme is directed towards urban settlements (36) and will not cover centres below the urban centre level. Development of industrial estates at the urban centre level

will have a supplementary impact on rural industrialisation programme during later phases of the programme. It is for this reason the industrial estates are discussed here, otherwise it is an urban programme.

Apart from development of industrial estates and Rural Industrial Development Centres, the I.C.D.C. undertakes to assist small scale industries directly through loans. In fact this was the only form of assistance before the two other programmes mentioned above. This direct assistance has a low financial allocation. Emphasis is on the Rural Industrial Centres Programme and the Industrial Estates Programme.

The policy of locating these industrial estates has so far confined them to the larger urban areas like Mombasa, Nairobi, Nakuru, Kisumu, Kitale and Nyeri (Nyeri Estate is not yet developed). The size of enterprise which locates in these estates is rather large, has a larger capital outlay and more sophisticated techniques. Between 1970 and 1973, the average employment per factory in these estates ranged between 15-17, and the average total investment was between Kshs. 228045/= and Kshs. 266 Kshs. 266,916/= far above what would be reasonable for small scale crafts activities (37).

Year	1969/70	1970/71	1971/72	1972/73
Project cost, Shs.	243,750	222,045	230,481	266,916
Jobs created, Total	250	370	404	606
Cost/Job Shs.	156 00	13,203	15,403	15,856
No. of Enterprises	16	22	27	36

Table 3. Job generation capacity of Industrial Estates

Source: Kenya Industrial Estates Report 1972/73, page 4.

The strategy for industrial estates may therefore be construed as decentralisation of investment to other growth poles, rather than to rural areas. Districts within which estates are built would therefore benefit only indirectly. Direct advantage would accrue to the centres (38). Due to the nature of enterprises suitable for smaller centres, and entrepreneural demands of small enterprises, industrial estates would be unsuitable for semi-urban and rural villages (39). Demand for industrial consumer goods in these areas would be insufficient, and infranstructural requirements below standards. Of the 21 centres surveyed, only ten had electricity, and fifteen tap water. None had trunk sewers. Thirteen had tarmac access roads and a further five, good grade murram roads. For higher level, modern small industries, this infranstructure is a pre-requisite.

Other limitations include demand on available community services. New large scale modern factories would require additional school space, recreation facilities, hospital services and most important, building space, and guaranteed industrial assistance. This is so because the agencies supplying the services are different from those offering industrial assistance and no co-ordination links are disccernable.

As mentioned in Section 3:2:2, rural crafts and artisan trades on the other hand are capable of adapting to the existing levels of these services. Housing needs, for example, are often catered for by the entrepreneur living on the premises for security and operational reasons. This situation is unacceptable on health and planning gounds, but it is real. Besides, the nature of activity does not result in seriously detrimental environmental conditions.

This serves to explain that the approach of R.I.D.C. and the conventional industrial estates differs fundamentally from that of the existing industrial enterprises. The programme for rural industrial-

sation as adapted would modernise them without much change in the existing level of services. If the programme has to benefit the greater number of settlements, the option lies with enterprises which would require lesser of these services, hence lower capital outlay. As shown here it is not a Rural Industrial Development programme meant to reach deeper into the rural areas and to cover the lesser urban centres. The programme started in 1970, with a government financial allocation of K£66,000, increasing over the years to reach K£284,000 in 1974. This sum was to be supplemented with another K£52,000 over the same period given to the I.C.D.C. for the development of small scale and cottage industries.

Years	69/1970	70/1971	71/1972	72/1973	73/1974	Total
Small Scale & Cottage Ind.	-	10	12	15	15	52
Small Industry Revolving Fund	90	100	110	120	130	550
Rural Ind. Dev. Programme	-	66	70	73	75	284
Sub-Total	90	196	192	208	220	886
Kenya Industry Estates	127	330	605	550	595	2,207
Sub-Total	217	506	797	758	815	3,093
Major Industrial Investments	187	250	250	250	250	1,187
I.C.D.C. Investment Loans	50	50	70	80	50	300
Total I.C.D.C. +R.I.D.P.	454	806	1117	1088	1115	4580

Table. 4: Financing of Small Industry Programme VS. Larger Interprises 1969/70 - 1973/74, K£'000.

Source: Kenya National Development Plan 1970-74 Page 326.

It is clearly apparent that the national strategy for advancement of manufacturing has a strong bias for the larger enterprises. (40). Even then, the small enterprises have now been recognised as essential. Almost 20% of the total financial allocation in the National Development Plan 1974-78 was devoted to development of small enterprises. Of this 66% was allocated to the Rural Industrialisation Programme including the Kenya Industrial Estates. The extent and depth of services offered by the K.I.E. make this programme more expensive than the Rural Industrial Dvelopment centres programme. However, the K.I.E. covers fewer enterprises (see Table 3). Although differing in approach and financial allocation, these programmes pursue the same objectives. Hence, it has been possible to re-organise Kakamega and Nyeri R.I.D.C's into industrial estates (41).

Small enterprises are adaptable to small rural centres and can be dispersed more easily among rural settlements. Their land requirements per enterprise are equally small. They are therefore not as seriously constrained by shortage of land as large scale enterprises. They are also largely non-polluting. Many of them share frontage with normal commercial activities with no environmental deteriment to the latter. They market their produce on retail basis and consequently they require conspicuous locations in centres. In Kirinyaga, this was especially true of garages, workshops and metal smiths.

Small scale industries are largely owner-managed (42) with a few other employees. In Kirinyaga District over 90% were owner managed and employed 2-4 persons on average. It is likely that owner-management interferes with the ability of entrepreneurs to utilise R.ID.C. facilities. Examples from Nyeri R.I.D.C. illustrates this point.

Although this centre is about three kilometres from the central business area where most clients are situated, this illustrates indifference to services offered at the R.I.D.C. It also shows that the centre is not offering the type of assistance which would require constant utilisation of the services offered. This is depicted on Table 5 below.

No. of times Centre is used	Clients		Jobs done	
	No.	%	No.	%
@40 and over	3	13	179	81
30 - 39	0	0	0	0
20 - 29	0	0	0	0
5 - 9	2	9	14	6
3 - 4	3	13	10	4
1 - 2	15	65	19	9
Total	23	100	222	100

Table 5: Extent of Utilisation of Nyeri RIDC metal workshop, March 1973-Jan. 1975.

Source: Institute for Development Studies, Nairobi University.

The nature of jobs carried out may be deduced from Table 6 below. Judging from the type of activities often carried out by rural crafts and small industries, it is not surprising that R.I.D.C. facilities are so rarely utlised. Two aspects of rural industrialisation programme are illustrated.

1. That tools and machinery in R.I.D.C's are hardly needed by crafts and cottage industries.

2. That even in the centres themselves, the jobs done are simpler than the sophistication of machines and tools suggests.

3. That under-utilisation results in large amounts of frozen capital.

There is therefore a case for a change in approach and for a relocation of resources for industrialisation of rural areas.

Machine	Historical cost	Time used
1. Electric Welder	Not available	72
2. Handpower Tools	"	21
3. Gas Welder	1683/=	19
4. Multi-roller Swaging - Machine	4085/=	16
5. Hand lever shear	N/A	15
	12350/=	5
7. Bending Roller	19950/=	4
8. Pedal Guillotine	9524/=	3
9. Sheet Metal folder	N/A	2
10. Pipe Bender	"	0
11. Notching Machine	"	0
12. Centre Lather	"	3
13. Grinding Machine	"	10
14. Hacksaw	"	6
15. Drill	"	3
16. Handlever shear	"	1
17. Corrugated Roller	12350/=	10

In conclusion, the approach to rural industrialisation is not as effective as it should be, as response from firms is low and only a few are assisted. Secondly, the few who are assisted do not utilise the facilities available with consequent loss of capital. Finally, the programme does not correspond with creation of a dispersed settlement structure. Consequently the effects of industrialisation in rural settlements has been ignored particularly in matters of locating individual firms.

1:2:1:2. LIMITATIONS ON IMPLEMENTATION.

The state of small industries in rural areas is mainly a result of the past economic system(45). The economy was geared towards extraction of resources from the rural areas for processing in urban areas and outside the country. In African reserves, infrastructure was developed for administrative purposes. Transportation was particularly developed to provide access to administrative centres, only. This buttressed the dominant role of major centres, especially Nairobi and Mombasa. The agglomerative forces of these centres outmatched those of other peripheral areas. The latter remained administrative centres, partly playing the role of collecting agents for the large centres. Restrictions on population mobility resulted in slow diffusion of innovative information to rural areas.

This is important in as far as it serves to explain the settlement pattern in Kirinyaga District and the existing transportation network. The settlements in this district reflect this dominance of core areas. Most of the firms found in them are relatively recent in origin - formerly, they were mere trading centres. Some of them e.g. Baricho and Kianyaga, are relatively stagnant since demand has shifted with major transport routes. Nearly a third of their premises were closed

and they had only seven activities between them. This emphasises the feeling that investments in rural areas are risky. The coloni al administration could have used this notion to postpone development in African areas. Efforts towards reversal of this tendency through decentralisation follow a centralised information channeling which reinforces concentration. Private savings in rural areas, which are deposited with financial institutions find their way to core areas where banks, insurance and savings organisations find it less risky to lend money. Except at Kerugoya where a coffee union has constructed a commercial block, all recent constructions which represent substantial capital outlay have been built by the government or parastal organisation. Examples are Mwea Rice Mill, Wanguru Cotton Ginnery and Kangaita Tea Factory. None of the firms interviewed had benefited from private financial institutions except from the I.C.D.C. The pre-independence economic system gave no room for development of small scale industries in rural areas. In fact, the World Bank Mission on Kenya's Economic Development in 1962 only mentioned the small scale industry, and then for urban areas (47). One can hardly attribute this to ignorance. This sector was hardly noticeable then. Consequently, its development was not included among the development objectives set.

Recently, the sector has expanded very fast. In 1954, only 14 of these firms existed. By 1973, 87 firms were receiving state aid (48). This illustrates the effect of opportunity creation and the existence of latent entrepreneural talent. Interviews of firms existing in Kirinyaga District revealed that all 25 of them were started since 1960. The entrepreneurs had acquired their skills from outside the district except one capenter and two saw mills. This shows that the effects of distribution of technology from major centres has reached rural areas. The four mechanics interviewed acquired their skills either in Thika,

Nairobi, Mombasa or N kuru. This changing trend of the economic system to the advantage of rural areas, coupled with government efforts to accelerate the change, has been subject to two opposed forces.

Firstly, there are the factors which limit expansion of small industries. These have been identified by their repellant effects on intending entrepreneurs. Their combined effect is to discourage investment in small industries in favour of more favourable enterprises - assuming that the will to invest is there. Table 7 below illustrates the effect of the positive actions the govenment is undertaking on these limitations.

Negative factors	Positive factors							
	A	B	C	D	E	F	G	H
1. Managment Ignorance	0	X	0	0	0	0	X	X
2. Lack of Opportunity	0	0	X	X	X	X	X	0
3. Lack of Finance	0	0	X	X	X	0	0	0
4. Lack of Skills	0	X	0	0	0	0	X	X
5. Other Investments	0	0	0	X	0	X	X	0
6. Investment Drive	0	X	X	X	X	X	0	X
7. Lack of Space	0	0	0	X	X	0	0	0
8. Transport	X	X	0	0	0	X	X	X
9. Marketing Problems	X	X	0	0	0	X	X	X
10, Disinterest	0	X	X	X	X	X	0	X
11. Legal restrictions	0	0	0	0	0	X	0	0
12. Lack of power	X	0	0	0	0	0	0	0
13. Lack of water	X	0	0	0	0	0	0	0
14. Community Services	0	0	X	0	X	0	0	0

Key:

0 = No effect on limitation

X = Action has positive effect on limitation.

Key to positive factors:

A = Infrastructural Improvement.
B = Extension Services.
C = State financial aid.
D = Private finance
E = Bank Loans.
F = Licencing.
G = Self - training
H = Aided Training

The next set of factors considered are private and government efforts to overcome these limitations. They have been combined into eight groups. It can be noticed that all of them attempt to remove a number of constraints. Private finance, bank loans and, licencing would remove the greater number of constraints- with extension services, government loans, on the job training and aided training only slightly less important. Infrastructural improvements play a lesser role in the removal of most of the constraints. Disinterest, lack of investment drive, lack of opportunity and marketing difficulties are the restrictions which most of the existing measures would alleviate.

This matrix helps to explain the fact that the combination of private and government efforts do not effectively cover the greater number of limitations in small industrial sector. It also helps to show that not all the limitations are equally important. Community services, infrastructural networks and commodity transportation are of little importance to small industries in the short run. This is borne out by the fact that cottage industries and crafts activities are less sensitive to lack of these facilities, (see 3:2:2),(49).

Among ways of raising finance, for example, private savings rank highhighest while bank loans rank lowest.

To conclude, implementation of the policy should place emphasis on methods of creating opportunity for investors. The small industry sector should be made competetive through encouragment of entrepreneural interest. Elements which limit opportunity, such as lack of space, restrictive licencing and stringent health requirements should be re-examined. Industrial assistance should therefore be more tangible and less package in nature (50). To avoid individualisation of extension services, groups of entrepreneurs could be given practical demonstrations together, similar to the way farmers attend demonstrations at farmers' institutes.

1:2:2. INDUSTRIAL POLICY IN COMPARABLE ECONOMIES.

The goals and objectives of other countries in organising industrial development have been similar to Kenya's. They have aimed at raising the economic status of as many of their nationals as possible in support of other welfare programmes. In the selection of the social strata to benefit from the programmes, and the geographical areas which should receive attention, developed and developing countries have differed. The depressed and special development areas of developed countries are comparatively more developed than areas disignated in developing countries. In many developing countries, the whole country may be regarded as "a special development area." Consequently the policy strategy for developed and developing countries differs substantially.

Programmes to expand small industries have been termed differently in different countires. Kenya has often called them "small industries" and has attempted to differentiate between small and cottage industries, which presumably include crafts and guilds. India, Mexico and Hong Kong

have utilised similar terms. Among the objects is one to substitute imports with local goods, assuming consumer indifference and favourable tastes. Major objectives concern a need to spread economic benefits of industrial activity to rural areas, diversify rural economies, improve the lot of rural communities and mitigate rural-urban drift (51). These conform to the objectives of the Commonwealth Foundation (52). This connects with a further goal of developing countries in their endeavours to industrialise rural areas i.e: Slowing down trend of increasing rural - urban migration, hence recognising the inseparability of rural and urban problems.

Programme approaches undertaken have varied in reflection of the varied social and economic systems, in magnitude and spatial extent. They have hwever, adapted a spectrum of objectives which could be summarised thus-: (53).

(a) To help industries, particularly small industries to overcome immediate capital and managerial problems.

(b) To assist industrialists to become competetively healthy and capable of standing on their own.

(c) To achieve greater equity of locating small industrial investments in economically backward areas.

It is not possible to generalise these objectives more as peculiarities in various countries demand peculiar approaches. In Hong Kong for instance, shortage of land requires that the strategy be to build "flatted factories" to accommodate those displaced by other developments, careful allotment of these flatted factories, and the auctioning of reclaimed, developed, plots for industry. (54) The capital and entrepreneurs are local and the objective of benefitting displaced squatters is achieved through a thorough administrative machinery. In Puerto Rico, development of industrial estates has the objective of attracting

foreign investments, particularly branches or new firms of American origin to benefit the total economy as a whole and probably relieve unemployment. Further incentives like tax relief, transport guarantees and subsidy, etc. are offered. The terms are attractive, and by 1958 some 500 firms had been established. (55) The policy does not involve equity, and decentralisation is not a major concern.

In Kenya, rural industrialisation has been adapted as a means of achieving social and spatial equity. Besides, the programme is expected to facilitate greater utilisation of local resources and import substitution. The programme in India has similar objectives (56). Implementation in India has involved organisation of a government implementation structure to administer the programme. Industrial estates have been constructed in selected centres. The premises are sub-let to entrepreneurs who further receive state financial assistance and managerial advice. This programme has not reached below the level of urban centres (57). Below this level, small industry development has been handled by the community development programme. F.C. Alexander (58) has recommended a varied approach to industrialisation at his level. The community development approach has been criticised as lacking in sufficient personnel and consequently ineffective (59). The parallel programmes in Kenya are the Industrial Estates for growth poles, and the Rural Industrial Development Centres for clients from rural areas. The two programmes overlap to some extent since R.I.D.C.S also assist clients from growth poles.

The objective of achieving equitable distribution of industrial benefits is largely political. It cannot be justified through cost benefit analysis and runs counter to the objective of a fast national growth rate. (Hilhorst 1973) The returns on resources do not measure up to returns in urban areas, and capital formation arising from rural investments is less.

The objective behind industrialisation efforts in Britain and Ireland has been to uplift the industrial base of "special Development Areas "(60). The government ensures that larger developments somehow do conform to the national objective of benefitting depressed areas. Since the Great Depression, various areas in Britain have been declared special areas, e.g. East and South Wales 1936, Cumberland 1937 and Scotland 1938. (61). The whole of Northern Ireland is one special Development Area and adapts a policy of attracting external investments in the manner of Puerto Rico. Unlike the latter, even single industrial buildings are at times constructed and rented out as "industrial estates."

In the U.S.A. and Canada, the idea of industrial estates has been much a matter of private concerns with a profit motive. In fact the two first projects were privately originated by British firms. (62) Only later has parastatal organisation of industrial estates, chiefly for area planning purposes (63), occured.

What needs to be emphasised here is the fact that the industrial programmes in developing countries have attempted to be distributive in intent while uplifting the general standard of economic well being of their communities. If defined in the British sense of unemployment, the whole area can be regarded as a Development Area, although pockets within are relatively more developed than others. The programme emphasis is on small industries which have been regarded as a suitable tool for developing small centres and semi-urban areas. Hence, while the developed countries have not limited the programmes to any level or levels of centres, nor limited the firm sizes to be located, the developing countries, due to their peculiar economic conditions have done so. Some have even limited certain activities to their nationals with the object of further increasing the domestic economic effects of the programme.

The economic difficulties which the industrialisation programme attempts to heal in developing countreis, like import substitution and utilisation of local resources, are non-existent in developed countries. So are the social objectives of industrial programmes, such as equity of benefits to individuals, and decentralisation of development efforts to benefit core area. Consequently, in matters of goals, developing countries have had to evolve their own industrialisation programmes. Policy objectives would have to differ for the same reasons. Only in the field of technical aspects of management and production, do the developed and developing countries find the need to use similar approaches. Even then, the nature of the goods, raw materials and the necessary level of technology as viewed against demand and availability, differentiates techniques of developed from those of developing countries.

Kenya has utilised her approach so as to run parallel to the national policy of decentralisation of service centres. The basic elements involved are discussed in the following section.

1:2:3 SETTLEMENT POLICY IN KENYA

National policy on decentralisation of investments has been given spatial input by the work of the Department of Urban and Rural Physicsl Planning.

The goals of the envisaged settlement system relate closely to the national goals of ensuring that national development efforts reach as large a number of people as possible, and that infrastructure and social services are brought nearer to the rural population. It is hoped that these efforts and services would be more effective if they are made available at points in rural areas, at which economies of scale would also be taken advantage of. The strategy is therefore to pinpoint certain places which would be identified by means of the already existing service

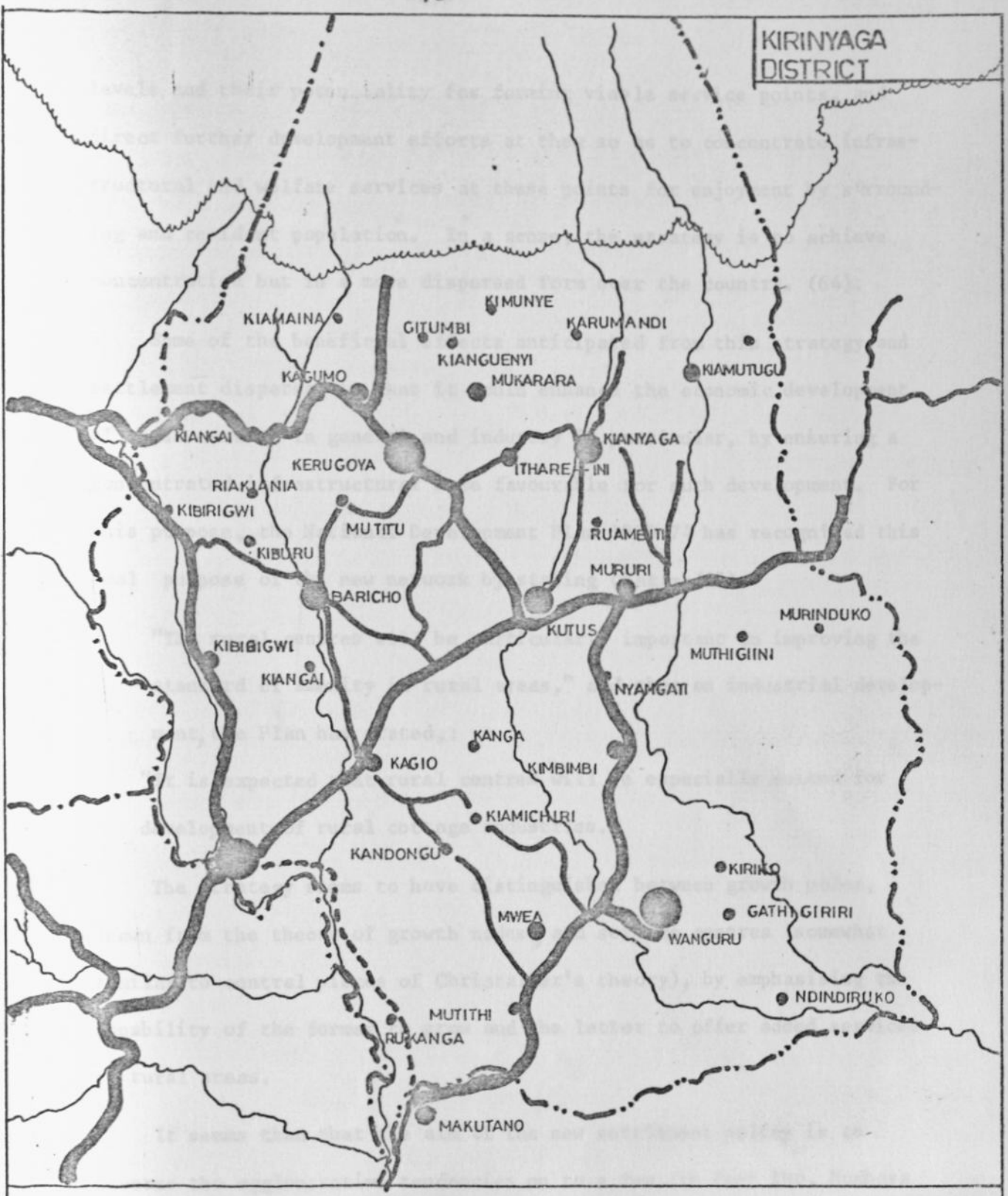


FIG. 2: PATTERN OF DESIGNATED SERVICE CENTRES
(Source: Physical Planning Department)

	Anticipated service area population
Urban centres	120,000
Rural centres	40,000
Market centres	15,000
Local centres	5,000

Scale 1: 250,000
km. 0 5 10
N

levels and their potential ality for forming viable service points, and direct further development efforts at them so as to concentrate infrastructural and welfare services at these points for enjoyment by surrounding and resident population. In a sense, the strategy is to achieve concentration but in a more dispersed form over the country. (64).

Some of the beneficial effects anticipated from this strategy and settlement dispersal is that it would enhance the economic development of these centres in general and industry in particular, by ensuring a concentrated infrastructural base favourable for such development. For this purpose, the National Development Plan 1970-74 has recognised this dual purpose of the new network by stating that:- (65).

"The rural centres will be particularly important in improving the standard of amenity in rural areas," and then on industrial development, the Plan has stated,:

"It is expected that rural centres will be especially suited for development of rural cottage industries."

The strategy seems to have distinguished between growth poles, (drawn from the theory of growth nodes), and service centres (somewhat similar to central places of Christaller's theory), by emphasising the capability of the former to grow and the latter to offer added services to rural areas.

It seems then that the aim of the new settlement policy is to reverse the agglomerative tendencies on to a few (in fact two, Mombasa and Nairobi) core centres, and create a less primate pattern of settlement to harness the reversed influence. As far as public investment in infrastructure is concerned, the aim would be assured of success (although this also depends on the co-operation of the spending sectors which might not be guaranteed). There seems to be a completely unguaranteed hope that entrepreneurship would participate in ensuring productive

and commercial activities locate in accordance with the new settlement pattern. Except through the lure of availability of infrastructure and that of a possible expanded market at a centre with rising population, there is an apparent gap between the strategy and the bulk of private investment.

1:3. KIRINYAGA DISTRICT BACKGROUND

1:3:1. BACKGROUND - PHYSICAL

The district now called "Kirinyaga" was curved out of Embu and Nyeri Districts soon after Kenya attained independence in 1963. Although thus arising from two separate districts, it has a uniform ethnic character and basic topography which make it relatively easier to deal with as a planning region. The district provides an interesting study subject in the area of industrialisation as most of its population has only recently adapted widespread monetary dealings and the economic system is not extensively distorted by frequent economic forces. This indicates that locational influences would be more a reflection of their causes than other unidentified economic undercurrents. Almost 98% of all the land has been classified as agriculturally high potential. (66). The population density was about 258 at the highest and 107 at the lowest, in 1969, with an average of 146 for the district. The Physical Planning Department, Kenya, has estimated a district potential output of about £6,000,000. The diversity of population characteristics is dealt with under "social characteristics" below.

1:3:1:10 PHYSICAL CHARACTERISTICS:

1:3:1:1: Location: Lying only 1^{o} South of the Equator, on the southern slopes of Mt. Kenya, the district experiences an equatorial climate tempered by altitude. It does not fall within the better known Kenya Highlands, (67). Its location administratively is in Central Province, Kenya, some 32^{o} east. It is the smallest district in the Province- one of the smallest in the country, about 1500$1m^{2}$. Being thus connected to neighbouring Nyeri and Embu, its economic links to these districts are noticeable. The strongest influence identified tends towards Nairobi and Thika, which exists in the form of transport corridors

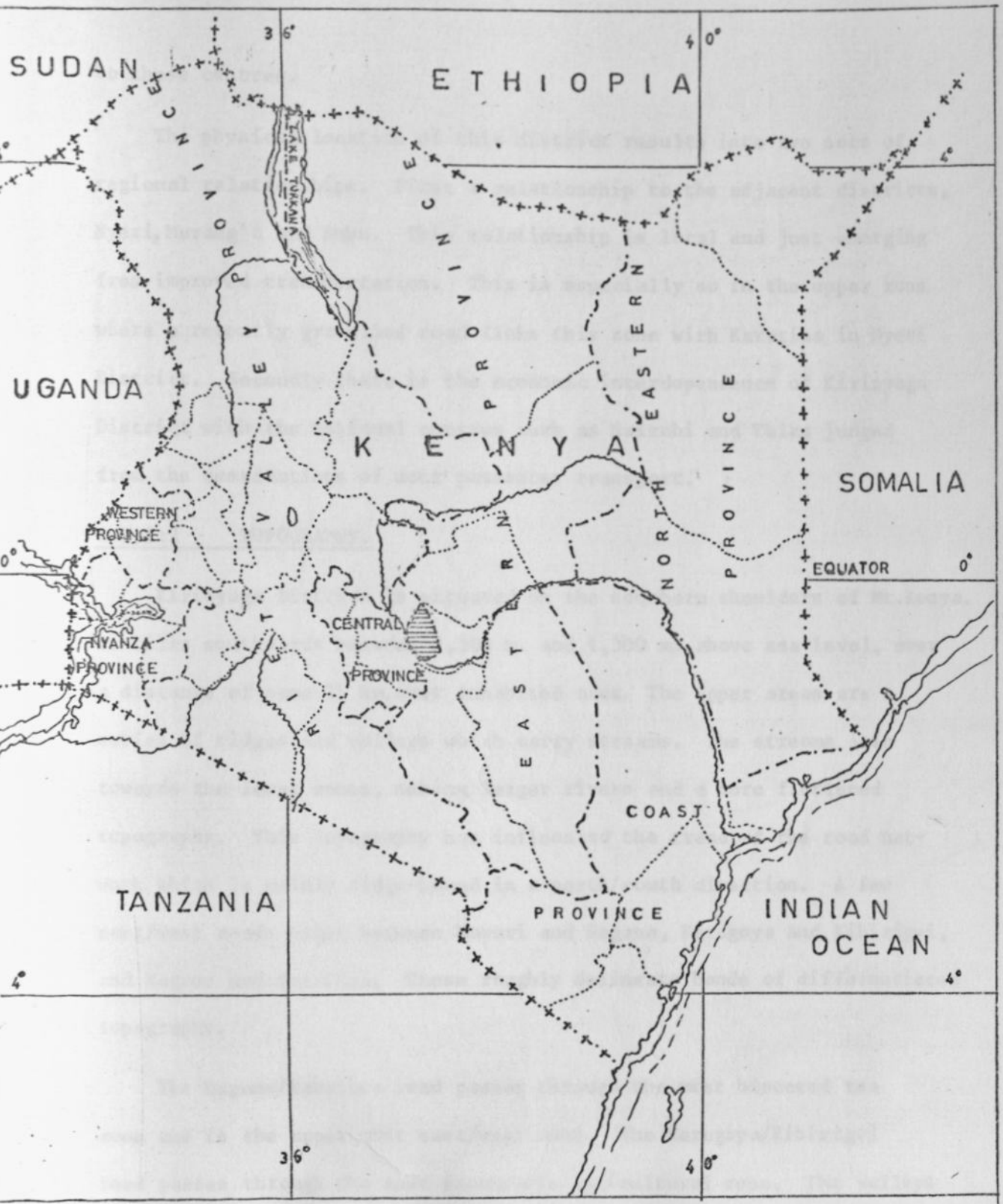


FIG. 3. LOCATION OF KIRINYAGA DISTRICT IN KENYA

LEGEND

- International Boundary
- Provincial Boundary
- District Boundary
- Mdjor Rivers
- Major Water Surfaces
- Kirinyaga District

0 50 150 200 km.

to these centres.

The physical location of this district results into two sets of regional relationships. First a relationship to the adjacent districts, Nyeri, Murang'a and Embu. This relationship is local and just emerging from improved transportation. This is especially so in the upper zone where a recently gravelled road links this zone with Karatina in Nyeri District. Secondly there is the economic interdependence of Kirinyaga District with the national centres such as Nairobi and Thika judged from the destinations of most passenter transport.

1:3:1:2 TOPOGRAPHY.

Kirinyaga District is situated on the southern shoulders of Mt.Kenya. It tilts southwards between 2,300 m. and 1,300 m. above sea level, over a distance of some 75 km. over inhabited area. The upper areas are a series of ridges and valleys which carry streams. The streams join towards the lower zones, making larger rivers and a more flattened topography. This topography has influenced the trend of the road network which is mainly ridge-bound in a north/south direction. A few east/west roads exist between Mururi and Sagana, Kerugoya and Kibirigwi, and Kagumo and Karatina. These roughly delineate bands of differentiated topography.

The Kagumo/Karatina road passes through the most bisected tea zone and is the upper-most east/west road. The Kerugoya/Kibirigwi road passes through the most favourable agricultural zone. The valleys in this belt are not as deep as in the upper zone, and the topography is less rugged. The Mururi/Sagana road marks the end of the valley and ridge topography and the beginning of the flatter areas of the lower zone.

Topographically, the district falls into three basic zones which are identifiable in all other districts which surround Mt. Kenya. The

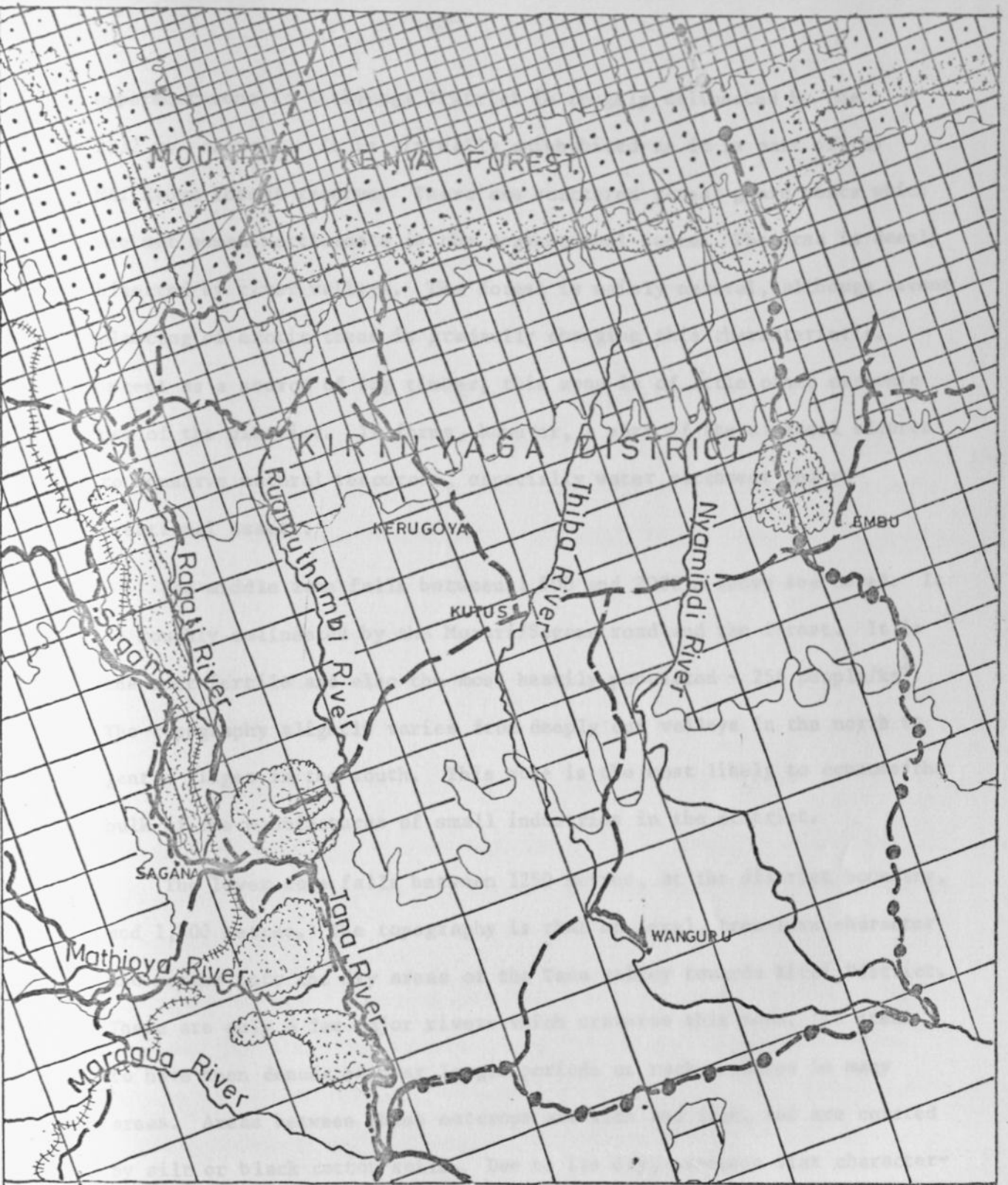


FIG. 4. PHYSICAL CHARACTERISTICS OF KIRINYAGA DISTRICT

LEGEND

- Land Below 1 332 m. a.m.s.l.
- 1332—1665 m.
- 1665—2000 ml
- 2000—2332 m.
- Over 2332 m.
- Major Rivers
- Forests and Bushes
- District Boundary
- Provincial Boundary

km. 0 5 10 N

uppermost zone in Kirinyaga District is roughly delineated by the 2332 m. contour. It is virtually uninhabited as it is part of the Mt. Kenya Forest reserve. There are scattered forest guard posts which are not human settlements in the conventional sence. The area is deeply bisected by river valleys. The forest is mainly natural, although recent planting of exotic trees is gradaully changing this characteristic. Except as a source of log timber, this zone is of little other economic use of the district. It forms, however, a part of the national efforts to conserve natural resources, especially water catchment and recreational assets.

The middle zone falls between 1,500 and 2000 m. above sea level. It is roughly delineated by the Mururi/Sagana road and the forest. It is the most fertile and also the most heavily populated - 258 people/km^2. The topography slightly varies from deeply cut valleys in the north to gentle ridges in the south. This zone is the most likely to consume the bulk of the manufactures of small industries in the district.

The lower zone falls between 1250 metres, at the district boundary, and 1,500 metres. The topography is that of level, tree-less character and merges into the dry areas of the Tana valley towards Kitui District. There are only a few major rivers which traverse this zone. It seems to have been denudated over longer periods as rock outcrops in many areas. Areas between these outcrops are wide and flat, and are covered by silt or black cotton soils. Due to its dry, treeless flat characteristic, this zone is peculiar to the district. Population is sparse and human settlements far between. Topography has been altered recently by the introduction of Mwea Rice Irrigation scheme - one of the largest in the country. The settling community has, however, remained concentrated at specific areas. The zone has therefore retained a flat open country scenery.

1:3:1:3. GEOLOGY AND SOILS

The bedrock in the district originated from the volcanic eruptions of Mt. Kenya, and belongs to the tertiary periods. This rock is prevalent in the upper areas of Nyeri, Embu and Meru Districts. Aggromerates, taffs and quartizites abound, and are most visible in the lower zones where denudation has exposed them.

The resulting soils are mainly from weathering of these rocks. In the upper zones, heavy mixture of brown neutral soils, dark red, and red acid soils are found. These overlay, and are in some areas mixed with, loams on deeply weathered topography. In the lower areas, loamy silts and recent sediments interchange with wide exapanses of black cotton soils. This suggets a productive mixture, although low rainfall restricts agriculture. With irrigation, the area is as fertile as the middle zone.

1:3:1:4. CLIMATE

The climate of Kirinyaga District has the features of an equatorial climate. Altitude has however tempered both the rainfall amounts and temperatures.

Rainfall has a two-peak per year season, in April/May and October/November periods. The monthly temperature range vary from north to south, the largest differences occuring in the north. Generally, the cooler months are July and August, and the warmest and driest are in January and February. The climate has effect on the seasonal crops like maize and beans for which the district has a two crop year, and coffee which is harvested twice in a year. The tea crop in the upper zone is harvested throughout the year with peak picking seasons within the peak rain seasons and a few weeks following. The relationship of the cropping periods to the employment of the local population is therefore seasonal

and some complementary arrangment with the requirement for seasonal labour and the intermediate sector may be worked out.

1:3:2 SOCIAL CHARACTERISTICS

As mentioned above, the district is inhabited by a common ehtnic group which is Bantu speaking. The nature of their livelihood is agrarian with a tendency to settle permanently at one place, carry out farming and keep livestock. Although much of their cultural activities have since been rendered impossible or redundant, these activities have been connected with seasons and periods of harvest when either there is less work in the fields or sufficient foodstuffs.

Their tendency to stably settle at a place, and the now completed process of land adjudication and registration has had the effect of displacing individual decendants. Like in other districts e.g. Murang'a, Nyeri, Kiambu, or Embu, the process tends to create landlessness or in less extreme cases, under-employment. The seasonal character of their activities, has no longer any bearing on the general lifestyle of the district community, but then relics of it can be identified in the drinking habits of the local people, and the lack of social or any occupations between the harvesting and the planting seasons.

1:3:2:1. POPULATION:

The district had a total population of 216,988 people in 1969 which has been assumed to have been growing at the national rate of 3.2% p.a. The total population in the district in 1976 would therefore be about 270,000.

Of the three divisions in the District, Ndia has the highest total and density and the best agricultural land. Simulteneously, this division is the smallest in area.

Divison	Total Pop.	Km^2 Area	Density
Nida	93406	362	258
Mwea	58,262	542	108
Gichugu	62,664	584	107
District*	216,988	1488	146

Table: 9 Population Distribution by Division.

Source: Kenya Population Census 1969. * Townships Included.

Thus, although the production capacity of peasant activities is almost the same within Gichugu and Ndia Divisions, there is a definite difference between the populations supported. Gichugu Division, judged purely on its production capabilities, would be able to support a much larger population than at present. There is also clear evidence of the effects of the earlier improved communications network, and contact with other divisions, on the settl ing community. Mwea Division has differing topographical, climatic and soil capabilities. Although rated high potential, the drought beats this area rather hard and its settled life has largely been made possible through irrigation. Where this has not happened as in Murinduko area, ranching has been the chief economic activity and population has been sparse.

1:3:2:2. SEX COMPOSITION.

A passing look at the sex structure of the population at divisional level reveals interesting differences. The adult female and younger population are relatively well distributed in the district. The Adult male population is less even, and is on the whole, less than adult females in all divisions except Mwea, where recent settlements have

apparently attracted male in-migration.

It is noticeable from Fig. 6 that the district is therefore an "exporter" of chiefly male manpower. The proportion of male adults is below the national average. Ndia division seems to suffer this emigration most, and has therefore a relatively high proportion of adult females. It has also a high proportion of female children similar to Gichugu division. Gichugu has on the whole more children than adults. This implies that this division has a relatively younger population, either by reason of recent settlement or greater emigration of adults.

Mwea division has a peculiarly high proportion of adult males and a comparatively low proportion of adult females. This division is in fact a receiving division in terms of migration, and its employment capabilities, the rice fields and mill, and the ginnery, has tended to lure more males than females into the division.

The male population in the district is therefore the most mobile. It seems that at adulthood, nearly half the males emigrate either to other divisions within the district or outside the district. (Data on inter-divisonal migration was not available at the time of thesis). It is possible to figure out that 3.2% of the population are unavailable in the district at adulthood - either by reason of emigration or death. Similarly, 4.8% male children emigrate at adulthood from Ndia Division and a corresponding 4.2% from Gichugu division. Assuming that the receiving Mwea Division sends only a negligible proportion outside its boundaries, it is possible to assume that only 0.5% of its population comes from outside that Division. This in-migration need not come from within the District, as distant ethnic groups are found in the Division.

However, assuming that the emigrating male population from the district, making up 3.2%, is made up from the two divisions of Ndia

KIRINYAGA DISTRICT

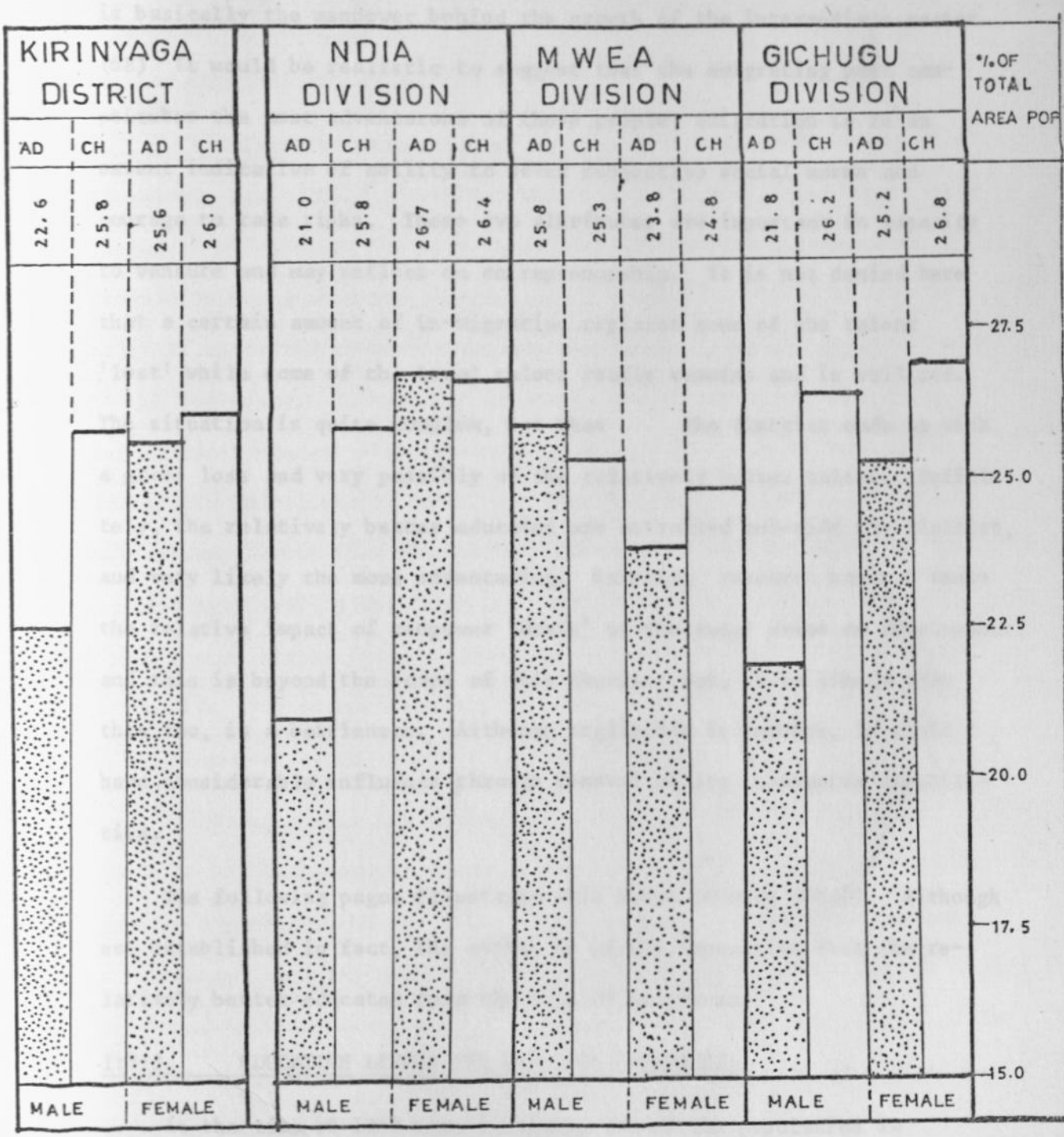


FIG. 5 .. AGE RELATIONS AND SEX RATIOS BY DIVISION

and Gichugu in proportion to their total male populations, Ndia Division sends out the larger of the two proportions (1.6%).

Recent research has shown that among rural people, the male segment is basically the manpower behind the growth of the intermediate sector. (68) It would be realistic to suggest that the emigrating part constitutes the most adventurous of these people; emigration is to an extent indicative of ability to sever subjective social norms and courage to take risks. These two altributes are important in capacity to venture and may reflect on entreprenurship. It is not denied here that a certain amount of in-migration replaces some of the talent 'lost' while some of the local talent really remains and is utilised. The situation is quite complex, but then the district ends up with a gross loss and very possibly of the relatively better talent. Definitely, the relatively better educated are attracted out-side the District, and very likely the more adventuring. Existing research has not shown the relative impact of manpower 'drain' of the rural areas on development, and this is beyond the scope of this thesis. But, it is likely that this too, is a bottleneck. Although negligible in numbers, it could have considerable influence through removal of its innovative capabilities.

The following pages illustrate this point in more detail. Although not established in fact, the author is of the impression that the relatively better educated form the bulk of emigrants.

1:3:3. EDUCATION LEVELS AND MANPOWER ESTIMATES:

At the time of 1969 census, nearly 75% of the population in Kirinyaga District had either no "formal" education or did not care to state they had any. (69) Of the "literate" 25% the majority was in school and below the age of 19. Due to the nature of school enrollment, some may have been in primary school even at that age, but then it is

assumed here that those older than this age and quoted as having primary education, had laready left school. Of the 'literate' population, only about 0.8% had reached beyond Form Two, which is here assumed to be the minimum formal education needed for technical training and possible entrepreneurship.

Total literacy figures do not by themselves represent the level of capability for technical work however. It is here admitted that little technical orientation has been included in the system of education. (70) It is also noted that the existing small scale and cottage industries might be owned and/or run by persons who had no technical orientation at the beginning. However, it is the stream of education that forms the manpower sources with improved training potential, if only based on formalised and literally eucation. For the sake of simplicity, it has been assumed again that the various levels of literally education represent potentiality for equally varied levels of technical training. Those who go beyond thirteen years of literal education and are therefore older than at most twenty five years, would be capable of higher level manpower, often required outside the district.

The group within the eighth and eleven year of education forms the bulk of the manpower potential for artisans, skilled workers and finally entrepreneurs. This is the category that therefore forms the backbone to rural industrial enterprise in the long run and its orientation to technical work is essential to the ultimate success of the Industrial Programme. The category below the eighth year of education may form the bulk of the unskilled and semi-skilled workers. The outlook towards their work and their potential for improvement of skills bear strongly on the technical orientation basis they are exposed to at the time of their school years.

It terms of the foregoing assumption, it has been noted that, of the total enrollment in Kirinyaga District, 73% reach a minimum of seven years of education. The remaining 27% leave school for varied reasons, and the bulk between standard four and six. Their age at the time, and their level of education limit their chances for any beneficial output to industralisation efforts. At the seventh class, about 54% are dropped, or 36.5% of the total enrollment. In terms of absolute figures, this represents about 3,000, school leavers. This group represents the lowest grade of manpower available for small trades such as tailoring, cobblery, capentery etc. Although they would be capable of acquiring skills, their managerial potential is low, and only a negligible number (to talk generally) has the capabilities of more intricate production.

Available data did not permit more detailed analysis of the different destinations of different parts of the system. It has not been possible to show for example, how many school leavers at each level end up in the service setor or other technical fields apart from industry. What Fig. 6 attempts to describe is the total volume of all school leavers available to all sectors in any one year. The figures refer to the base year flow in 1974. With the assumption of proportionate increases in the short run, the per centage figures apply, but adjustment is required as proportions are expected to change in the medium and long run. This is so because, particularly the huddle between standard seven and Form One is affected by the availability of more secondary school places. Similarly the situation at Form Two and Four, improved rural income levels, would have considerable effect besides the added opportunities in more schools.

While it is noted that most enterprises in existence are owned and/or managed by relatively less educated but somewhat literate people, (71) it is also notable that the situation in which they were

KIRINYAGA DISTRICT

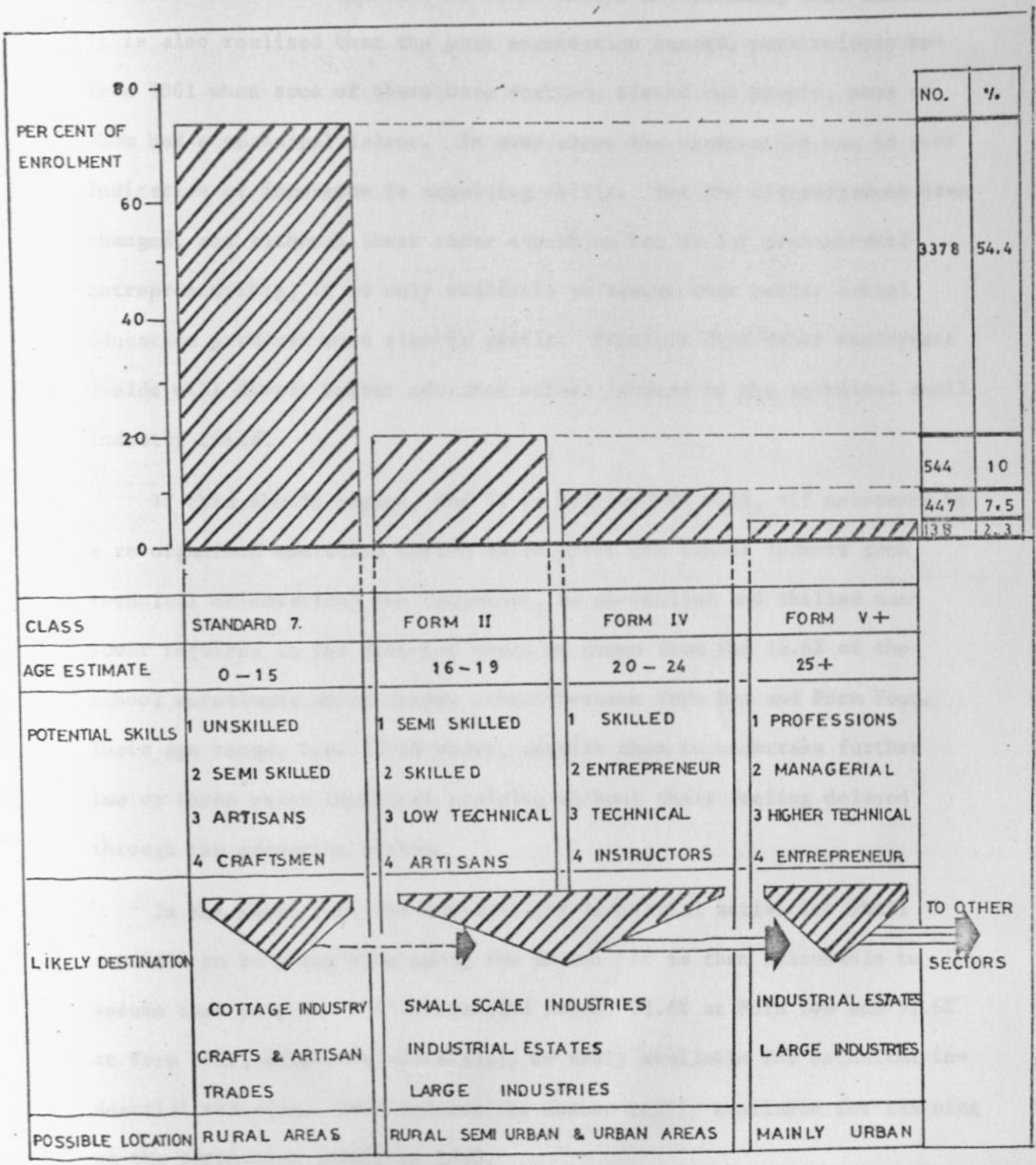


FIG. 6. FLOW OF MANPOWER FROM THE FORMAL EDUCATION SYSTEM TO INDUSTRIAL SECTOR

started is gradually coming to an end. School leavers, though not appropriately technically oriented, are becoming less choosy in their careers, while opportunities for alternative employment, which may have diverted the better educated to other fields are becoming more limited. It is also realised that the past examination system, parcicularly before 1961 when some of these were started, sieved out people, some of whom had a technical talent. In many cases the examination was no sure indication of impotence in acquiring skills. But the circumstances have changed, and although lower cadre education has so far predominated entrepreneurship, it is only realistic to assume that better school education produces more elastic skills. Pressure from other employment fields will divert better educated school leavers to the technical small industry field.

If this should happen, and it is believed it will, (if necessary by a re-organised education system which gives the school leavers some technical orientation) the technical, se mi-skilled and skilled manpower required in the district would be drawn from the 29.6% of the school enrollment which leaves school between Form Two and Form Four. Their age range, i.e. 15-24 years, permits them to undertake further two or three years technical training without their feeling delayed through the education system.

In the short run, the manpower for industrial activities shall continue to be drawn from among the males. It is then reasonable to assume that only 56 % at standard seven, 71.6% at Form Two and 91.6% at Form Four, who,being males,shall be truly available for technical industrial training. This reduces the number really available for training at the respective levels as 1890.

It is then noted from Fig.5 that 3.2% of the males emigrate to areas outside the district. This per centage surely includes males

from all education levels, but then to differing degrees. It is assumed that the better educated migrate at greater rates than the less educated. No statistics are available on this, and it has been assumed that a group's propensity to migrate is proportional to the number of years it has been in school. Hence a school leaver at Form Three (Ten years in school) has twice as much will to emigrate as a school leaver at standard(Five years in School). The males ultimately available for training are shown on Table 10 below. (71)

Class	Males Available	% Migrating	No. Migrating	Ultimate No. Available
Std.7	1890	0.56	egligible (10)	1890
Form II	390	0.72	egligible (3)	390
Form IV	420	0.88	Negligible (4)	420
Total	2600	2.76	17	2600

Table 10: Ultimate Manpower available for industrial employment, in the the short.

Due to the high unemployment levels, spatial distribution of school leavers in the district would not cause a significant difference in the choice of location. Manpower mobility in the district is therefore assumed to be easy. Again, population mobility with employment prospects seems to be equally easy, judging from the emigration of males. The latter is not regarded as limiting to industrial location within the district. Apparent industrial disparity in the district does not, therefore, arise from unequal distribution of manpower. The cause for this disparity is explained by varying economic influences which are covered under Part 2, below.

In a regional perspective however, it is noted that a characteristic low availability of the technical knowhow, found in most rural areas in

the country, pertains in the district. All the firms visited are run on skills obtained from outside the district. This indicates the often emphasised need to create local sources of manpower by orienting the existing education system towards this objective and creating outright technical institutions.

Having estimated the magnitude of manpower potential, a possible scheme of training to assist in achieving this has been formulated (73). It has already been mentioned that technical orientation should be offered mainly from the upper classes in primary school. This orientation should progressively be made more sophisticated; from handling of simple tools and materials at lower levels, to taking managerial responsibilities, book keeping and handling of electrical and welding equipment at the secondary school levels. At each school leaving level, selection to technical institutions should be more formalised and incorporated in the mainstream of the education system. This should also be made to conform respectively to village polytechnics at primary level and industrial centres, and Institutes of Technology at the secondary level. Technical institutions should also formulate a parallel education system in the line of technical education so that apprentices may upgrade from village polytechnics to an institute of technology.

As these facilities are few in the district (the Institute of Technology is under construction), selection could be initially limited to 2% at primary school (about 40 students) about 5% at Form Two (about 20 students) and about 5% at Form Four level (about 20 students). Attempts should also be made to make technical training popularly acceptable and to remove the impression that it is second rate education. The importance of this form of education to national production equals, if not surpasses, that of the more academic forms of education.

1:3:4 ECONOMIC CHARACTERISTICS

As may have been already gathered, Kirinyaga District is economically an agricultural district. A wide variety of susbsistence and cash crops are grown. These include Coffee, Rice, tea, cotton and tobacco in that order of importance. Subsistence crops viz. maize beans and a variety of vegetables are also grown. The cash crops share in the national monetary economy and their production is a matter of national policies.

Marketing of coffee is organised through a district co-operative union. Income to the district from this crop has increased from K£633,831 in 1965, to K£2,202,350 in 1974, a clear indication of rising rural incomes through expanded output and improving prices. Average farmers' incomes from the crop has however, tended to fall as the table below illustrates, giving way to tea whose average benefits

Crop	Av. Income	Per farmer	sh.	
	1965	1966	1967	1968
Coffee	821.4	821.6	757.8	725.0
Tea	261.00	373.4	494.6	755.0
	157.7	382.1	254.8	490.00
Rice	3120.6	3748.9	3120.6	365.0*
Maize	-	-	-	57.0
Beans	-	-	-	41.6

Table 11. Average Farmers In-comes 1965-68 from main crops.

Source: District Agricultural Reports (74)

to farmers has quickly increased. By acrage and output tea has increased considerably in the last five years, and the trend continues. In 1970,

for example, 303,700 Kgs. were sold. IN 1971, 492,00 Kg. were sold, more than 1½ times the 1970 crop. Marketing of this crop is done through auctions by agents of specific factories. Crop development and expansion is done through the parastatal Kenya Tea Development Authority. The ultimate objective, besides improving farmers incomes, is understood to be assisting tea farmers towards final purchase of the processing factory rather in the manner the coffee co-operative controls initial coffee processing. Tea is however processed to its final stage (except packaging) at the local factory.

Rice is produced under a re-settlement programme at the Mwea - Tebere Irrigation Scheme under the auspices of the National Irrigation Board.

The crop rates second to coffee in the district. The location of the scheme and the factory has given rise to a new and thriving community centre at Wanguru. In 1965, the crop fetched K£250,737 and continued to increase to K£919,355 in 1974. Marketing of rice is done through Kenya Maize and Produce Board whose warehouses are found at Sagana, within the District.

Cotton, whose value reached a peak of K£65,032 in 1969 shows signs of decline, fetching only K£16,896 in 1974. Ginning is done at Wanguru and the produce sold through the parastatal Cotton and Lint Marketing Board. The cotton zone is transitional between the lower, generally dry, south and the middle zone - a large area, but other crops seem to take precedence. Rice and cotton grow in the lower and middle zones, coffee and tea grow in the middle and upper northern zones. The trend of output of these crops is indicated on table 12 below:

crop	Output value in Kf				
	1965	1966	1967	1968	1969
Coffee	633,831	723,442	679,176	666,653	707,153
Rice	250,737	318,659	-	61,839	65,032
Food crops	134,379	215,790	-	182,002	92,393
Livestock	15,464	16,739	-	35,658	36,658
Sisal	10,248	6,766	-	-	-
Wattle Bark	3,628	2,937	-	35,285	96,720
Cotton	4,154	28,000	20,331	32,5597	65,032
Tobacco	3,376	1,364	-	4,850	10,511
Tea	31,868	45,710	53,330	106,243	137,457
Total	1,087,685	1,359,417		1,155,127	1,210,956

Table 12: Crop value realised, 1965-1969. Figures for 1967 were not obtainable for all crops.

Source: District Agricultural Reports, 1965-1969.

The fast increase in crop values is illustrated by the fact that over 8,000 growers (some growing more than one cash crop) realised £3,530,746 from coffee, tea, cotton and rice only, in 1974.

Spatial distribution of this income, based on sources of these crops suggests that the upper and middle zones (Ndia and Gichugu Divisions), and Wanguru area enjoy high per capita incomes. This would seem to be the explanation for a fairly diverse composition of industrial activities along the Kerugoya, - Kutus and Kutus - Sagana corridor- and Wanguru area. (see Fig. 15). Added to estimated values of bananas, beans, potatoes, peas and other vegetables, the revenue to the district, from agriculture ranges between £3.5 million and £4.5 million. In 1973 for example, income from these crops was about £3,330,000. Based on the noted potential in the district (see under 1:3:1) the district has a capability for over £6 million

per year. This will of necessity accrue to the middle and upper zones, centring on Kerugoya/Kutus belt.

Employment in manufacturing and services in the district has risen from about 3390 in 1965, to over 7,300 in 1974. The main employment areas are concentrated around the trading centres, especially in Kerugoya, Kutus, Sagana and Wanguru. Of this, about 800 are employed in small scale industries (see Table 19). It is estimated that some 300 more work places would be created by further expansion of small industrial acitivities alone. Employment in small scale farming activities, which form the main income source for the district, was about 9,800 in 1971. The average earnings per regular workder in this sector is about shs. 1040/= p.a. (1971) which is expected to have increased in relative terms in recent years (75). Total wage employment in the district is estimated at about 18,000 - 20,000, which represents about 9% of the total district population.

The earning capacity of this employed population, and its general distribution within a roughly central belt, represents an important basis for location of service and manufacturing activities as indicated on Fig. 13. The arising purchasing power, which is assumed to be increasing, has been utilised to determine possible variations of products in the industrial belt identified.

Foot Notes to Pa:t I

1. See (a) "Industrial Estates in India", P.C. Alexander, Bombay 1961 and (b) "Industrial Estates in Africa" U.N. Economic Commssion for Africa, New York, 1965.

2. Ibid.

3. A series of these evaluation reports have been done by the Institute for Development Research, 104 Vester Voldgade D.K.1552, Copenhagen V, Denmark.

4. Working papers Nos. 127 and 130, Institute for Development Studies, University of Nairobi, Kenya.

5. Ibid, working papers No.183, of 1974.

6. "Industrial Geography of Kenya" paper by R.B. Ogendo, Nairobi University and "Location and structure of manufacturing and Service Industries in Kenyas Central Provincial District", page 10.

7. Op. Cit. 1(a) above

8. Op. Cit. 6 above

9. "Regional Planning and Development" J. Hilhorst, Rotterdam, 1973, and "Industrial location," D.M. Smith, New York 1970, have reached conclusions on which this interpretation has been based.

10. Op. Cit. 1(b)

11. See 1:1 above

12. Op. Cit. 9(a) " " "

13. Beer S. "Decision and Control" Willy and Sons, New York 1968.

14. See also, "Occasional Paper No.12 I.D.S. Nairobi University 1975, Chapter II, where existence of latent skills in rural areas has been recognised.

15. " A partial Assessment of Rural Industrial Development Programme" Project Paper No. D75.1, Per Kongstad, I.D.R. Copenhagen 1975. (Unpublished).

16. (a) Ibid Page 44, and also (b) "An Evaluation Report on Special Rural Development Programme" I.D.S. Occasional Paper No.12. Nairobi University 1975.

17. " A production Function Analysis of Different Firm sizes in Kenya " L.P. Mureithi, I.D.S. Working Paper No.183, Nairobi University.

18. The levels of assistance have been small and sometimes inadequate, Op. Cit. 16 (b) Above.

19. Kenya National Dev. Plan. 1974-78, Government Printer, Kenya.

20. Commonwealth Seminar on Human Settlements, Nairobi 1973, and National Dev. Plan, Kenya 1974-78.

21. No clear definition of small industry is found from development plans. Official Statistics have defined large scale firms as "those employing more than 50 workers." Small scale industries are here taken as the converse.

22. This arises from lack of size limitation in development plans.

23. "Legal Framework for Small Scale Enterprise" (Article by 1. Innkai), F.C. Child and M. Kempe, I.D.S. Working Paper No.6, Nairobi University.

24. (a) Licencing has been criticised as detrimental to industrial development at the national level, see, "Economic and Fiscal Commission

Report" Kenya, 1961 and "Economic Development in Kenya" .B.R.D. Report 1962 and a Similar Report for Tanganyka.

24. (b) "An Empirical Study of Small Scale Industries in Kenya" F.C. Child, I.D.S. Working Paper no.127, Nairobi University 1974, page 5, and (b) 'S.R.D.P. Evaluation Report' I.D.S. Occassional Paper no. 12, Nairobi University 1975. Chap.11

25. Ibid, no. 24

26. Ibid No. 24(a)

27. It has been concluded from statistics that both forms of assistance have not achieved much. Numbers covered are low and response poor.

28. These huddles demoralise private initiative, especially in a situation where these limitations have been so prevalent.

29. Op Cit. no. 24 above.

30. These limitations do not seem to have seriously deterred investors as indicated by the sharp increase in the number of firms in the last twenty years.

31. It has been shown that both forms of assistance do not reach a large number of firms, op. cit. no.24 above especially due to the low numbers reached and the response shown. These hindrances to new firms are more serious.

32. Some entrepreneurs have shown reluctance to take loans perhaps for fear of insecurity see op.cit. No. 24(a) above.

33. Three interviewees mentioned that twice they have applied for space and they have been turned down on the gounds. Credit - worthness.

34. "Economic Development of Kenya," IBRD Report 1961, pages 167-168.

35. By 1960, the Industrial Development Corporation had received only £466,000, compared to £4.6 million allocated to the I.C.D.C. over a similar 5 year period in 1970-74.

36. (a) Kenya National Development Plan 1974-74,

(b) Kenya Industrial Estates, Annual Report 1972-73, Page 12.

37. Of the 25 activities interviewed in Kirinyaga, 8 of them indicated they had an average capital outlay of shs. 23,000 each,, and the rest less than that.

38. This does not include all urban centres in a district. Urban Centres which are also district administrative centres are to be gradually provided with small industrial estates. See Kenya National Development Plan 1974-78. Kerugoya is to have such an estate in 1977. This does not mean it is the centre with the highest industrial potential in the district.

39. Alexander F.C. "Industrial Estates in India," Bombay 1965.

40. If the cost of purchased machinery, could be used as indicator for this tendency, five machines at R.I.D.C. Embu metal workshop had a historical cost of shs. 46,000/=. This capital outlay is beyond the means of small enterprises.

41. Op. Cit. 24(b) above, page 50. Nyeri industrial Estate is under consideration and space for it has been suggested.

42. Op. Cit. 24(24).

43. Of those interviewed, only two were beneficiaries of I.C.D.C. loans. One was a client of R.I.D.C. Nyeri. Others indicated that they had applied for financial assistance from banks or R.I.D.C. but had been turned down. The most common reason mentioned was failure to prove creditworthy. Only a few utilised

the R.I.D.C. facility.

44. Of the 222 jobs done at R.I.D.C. Nyeri in Mar. 1973 - Jan. 1975, 80% were done by 3 clients only. 15 clients utilised the centre 1-2 times over almost two years.

45. Hilhorst J. "Regional Planning and Development" Rotterdam 1971. Argument is tendered here to show that centralised administrative structures result in primate settlement patterns. He also states that emphasis on national development is incompatible with equitability of development in peripheral areas. Rural industrialisation, being a programme aimed at equitable development will slow down the rate of national development. This arguments are seen to be true in respect to Kirinyaga District.

46. Hyden, Jackson and Okumu J. "Development Administration - A Kenyan Experience," Oxford University Press, 1970.

47. I.B.R.D. Report "Economic Development of Kenya." New York, 1961, pp.162-163.

48. Op. Cit. 24(a)

49. Op. Cit. 24(a)

50. The effect of the Rural Industrialisation Programme may only be measured over the 5 years of its existence. The idea was however accepted along with the Special Rural Development Programme, in 1966 at The Kericho Conference.

51. Op. Cit. 39.

52. Commonwealth Foundation Conference on Human settlements, Report 1974, Nairobi and Kenya National Development Plan, 1974-78, Govt. Printer Kenya.

53. Op. Cit. 39 and also Economic Commission for Africa, "Industrial

Estates in Afric[illegible]" U.N. Report, New York 19[illegible]5.

54. Op. Cit. 39

55. Quoted from Alexander F.C. Op. Cit. 39.

56. Government of India "India's Industrial Policy Resolution, 30th April 1956," quoted from Alexander F.C., Op. Cit. 39.

57. Op. Cit. 39.

58. On evaluating the progress and constraints for the Special Rural Development Programme, the Institute for Development Studies has arrived at similar conclusions, Op. Cit. 24(b)

59. Kuklinski A. "Growth Roles and Growth Centres in Regional Planning" Moulton and Co., Netherlands 1972 pp. 141 - 168.

60. H.M.S.O., "Distribution of Industries Act." Britain 1945.

61. The impact of this community development approach to industrialisation has been doubted. See Smith D.M. "Industrial Location, An economic geographical Approach" J. Willy and Sons, New York 1971.

62. Ibid., also op. cit. 24(a).

63. The Ajax Planning scheme near Toronto, Canada and the clearing Industrial District in Chicago are examples of private enterprise in industrial estate construction.

64. Kenya National Development Plans 1970-74, p.85, and 1974-78 page 305.

65. Ibid. 63(a) page 88.

66. Commission on Land Consolidation and Registration. Government Printer Kenya, 1965.

67. Odingo R.S. "Kenya Highlands," Oxford University Press, 1970.

68. Op. Cit. 24(a)

69. Kenya Population Census, 1969, Volume III, Government Printer Kenya 1970.

70. This applies to periods after 1962 only. Before, capentery, sewing, knitting, handicrafts and rural science was taught at primary and the then intermediate schools. These programmes were abandoned at independence.

71. Op. Cit. 24(b) Table 17. Over 35% of the firms interviewed were managed by people with less than 4 years of formal education. Another 36% had between 4-7 years and only a negligible number with more.

72. Those who proceed beyond form IV take over 13 years in school. Their will to emigrate is therefore highest.

73. See also Fig. 7, for the likely destinations of school leavers.

74. As no drastic fall in prices, quality of seeds or soil fertility was noted in this year, this figure is regarded as unreliable.

75. Statistical Bureau, "Kenya Statistical Abstract," Govt. Printer Kenya 1975. This value is estimated.

2: LOCATION DETERMINANTS:

2:1:0 RAW MATERIALS BASE:

Raw materials available in Kirinyaga District have been classified into two groups to facilitate analysis:

(a) Those raw materials which come mainly from agricultural sources and are mainly obtained from local farms or forests. The chief raw materials in this group include rice, coffee, tea and cotton. Their processing takes the greatest number of employees in agro-based activities. Their distribution is shown on Fig.7 below.

(b) Secondly, there are those raw materials whose sources are non-agricultural or which have gone through at least one stage of processing previously. These form the basis of re-use industries such as scrap sheet metal, scrap metal, frame steel and cured timber.

2:1:1 AGRICULTURAL RAW MATERIALS

On the basis of total employment in production and processing, agricultural raw materials rank highest. Output has been rising in nearly all of them, except cotton, and to a lesser extent, tobacco. In very general terms, areas of production seem to determine largely the location of the processing activities.

These raw materials have been classified further, under cash and non-cash crop raw materials. This is only to facilitate official data analysis, as all crops in the district are now oriented to a monetary economy. No purely subsistence production was identified. This monetarisation seems to explain the increasing crop acreages for most of the so-called subsistence crops. In fact, there has been developments in other areas of Kenya to process almost 90% of the crops grown in the district. Factories exist in the country for packaging of processed

maize, beans, peas, v getables, fruits etc. Only proportions of sold as against consumed produce define what may be called subsistence or not. The differenctiation is becoming continuously more blurred.

2:1:1:0 Cash Crop raw materials

The most important agricultural raw materials, (if employment at processing could be used as a criterion), are coffee, rice, cotton, and tea. With the completion of Thumaita tea factory, tea processing will displace rice processing. Hides and skins are not processed in the district, although there is some potential for this too. Recent quantities of the products show that cash crop processing is on the increase.

Product	Quantity (tonnes)	Year	Trends
Coffee	1185	1973	Output rising
Tea	1713	1974	Output rising
Cotton	281	1973	Shows fluctuations
Cotton Seed	126	1973	Shows fluctuations
Tobacco	11	1973	Shows decline
Hides and Skins	17581(Units)	1974	Output rising
Potatoes	9443	1974	Output rising
Maize	48,981	1974	Estimated
Wattle Bark	328	1974	Output rising
Beans	5072	1973	Output rising
Cabbage	1500	1974	-
Bananas	22070	1973	-

Table: 13. Quantity of Common Agricultural Raw Materials, 1973/74.
Source: Central Province Annual Reports 1973 and 1974.

2:1:1:1 Coffee:

Coffee is processed in the district partially. Coffee factories in the district number 21. Only a few (See Fig. 12) are located within reach of existing centres. Factories remove the 'husks' only. The berry is sold in this semi-processed form through the District

Co-operative Union. What may form the basis for further processes is the 'husk', which is at present utilised as manure. If mixed with other forms of manure, this could form the basis for manure preparation, praticularly in a district where fertilizers are in demand.

Distribution of this crop is in the middle and lower upper zones overlapping with both tea and cotton growing areas. The sheer weight of the raw berry and the present mode of transport to factories (by humans, donkey and motor vehicle), coupled with the need for free flowing water during processing, determine largely the location of these factories. Accessibility to product forwarding routes to Nairobi is also a factor. At the local level, a fairly level drying area is also essential. Terracing has been done on slopy grounds. Employment in this activity is seasonal, depending, as it does, on seasonal coffee harvests. Impact at a centre could therefore only be seasonal and largely temporary.

International price fluctuations affect total acreage, but even then the raw material has been gradually increasing.

2:1:1:1:b Tea: Due to sensitivity to altitude and climate, this crop is confined to the upper zone, roughly above 1600 metres. Its introduction to Kirinyaga dates to early 1960's. The crop has quickly caught up. The green leaf is sensitive to weathering. Consequently, distance from the farm to the factory, and the capacity of the farms within a certain radius are important factors in determining factory location. Transportation from gathering centres to the factory is centrally organised by factory personnel - unlike transportation of coffee which remains the farmers' responsibility.

Kangaita factory has a capacity for 9,000kg. of green leaf per day. Statistics show that it works under-capacity during the low picking season in January to early March. There is therefore a

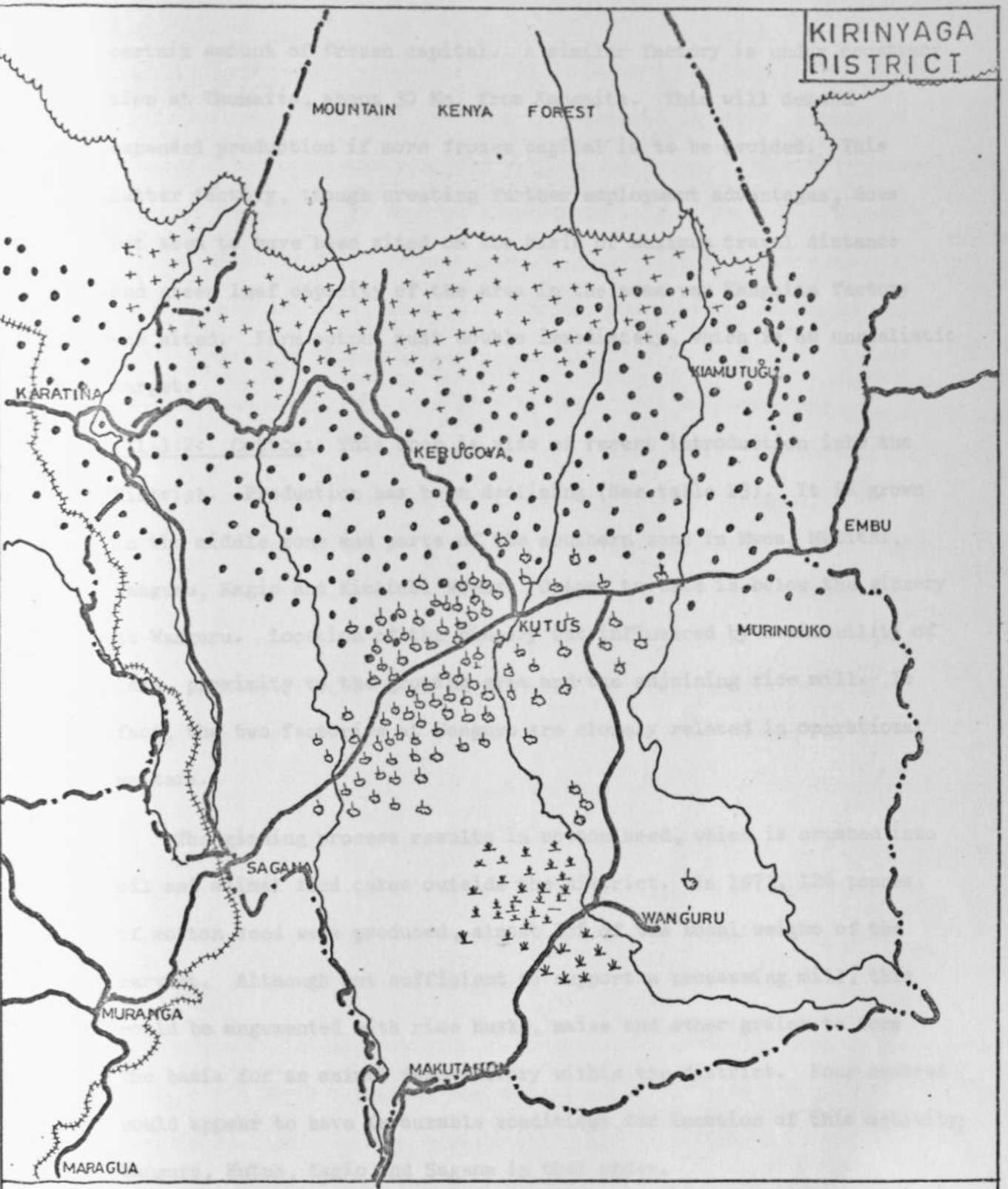


FIG. 1 . CASH CROP AREAS

Tea growing areas

Coffee " "

Cotton " "

Rice " "

Forest

Major Rivers

Raiw Railway line

Major Roads

Scale 1:250,000

km.

0 5 10

N

certain amount of frozen capital. A similar factory is under construction at Thumaita, about 30 Km. from Kangaita. This will demand expanded production if more frozen capital is to be avoided. This latter factory, though creating further employment advantages, does not seem to have been sited on the basis of maximum travel distance and green leaf capacity of the area in the same way Kangaita factory was sited. Farm output must double immediately, which is an unrealistic target.

2:1:1:2: Cotton: This crop is also of recent introduction into the district. Production has been declining (See table 13). It is grown in the middle zone and parts of the southern zone in Mwea, Mutithi, Wanguru, Kagio and Kimbimbi areas. Output to-date is below the ginnery at Wanguru. Location of the ginnery was influenced by availability of land, proximity to the growing area and the adjoining rice mill. In fact, the two factories at Wanguru are closely related in operational matters.

The ginning process results in cotton seed, which is crushed into oil and animal feed cakes outside the district. In 1973, 126 tonnes of cotton seed were produced, almost 33% of the total weight of the harvest. Although not sufficient to support a processing mill, this could be augumented with rice husks, maize and other grains to form the basis for an animal feed factory within the district. Four centres would appear to have favourable conditions for location of this activity; Wanguru, Kutus, Kagio and Sagana in that order.

Further activity which could be generated from this raw material is mattress making, which could utilise locally grown sisal (now almost forgotten on commercial scale), besides low grade cotton. Again, for reasons of procurement and distribution, Kutus, Wanguru Kagio and Kerugoya are favourable locations.

2:1:1:3 Rice: Thi raw material is based on irrigation in the middle lower zone where some 5533 hectares were planted in 1974. Production per acre (73.3 bags) was realised in 1974 due to use of low production variety. Processing is done at the rice factory at Wanguru. In combination with the rice scheme, this has given rise to a new community spreading between Mwea, Wanguru and around the factory. Location would seem to have been chosen mainly on availability of flat, well drained soil, near enough to the rice growing area. All weather roads, electricity and water have been made available later. The factory functions seasonally according to rice harvests, It has handled varying amounts of rice, although the capacity has not been reached yet. The product is finished, ready for marketing at the factory. Production is organised on a tenants co-operative basis and produce is delivered to the factory on this basis. From there on, the produce is handled through the Irrigation Board. The process is completed within the district.

However, rice husks and low grade rice may be subjected to further processes to produce animal feed. This possibility has been mentioned under cotton seed. Wastes from rice may also be combined with grain (grown locally) for the purpose.

On the whole, the district is an important grain producer in the province and forms a logical regional location for such a process. Nyeri is another area with similar advantages, especially in the potential demand for animal feed. The activity is estimated to be capable of employing between 30 and 50 people initially. It is noted that no animal feed factory exists within proximity of this region. Other and better endowed grain areas, with discernable markets, were given priority in the pre-independence days.

2:1:1:4 Tobacco: This crop grows widely through the district, mainly in the middle zone. In 1973, some 11.0 tonnes of cured tobacco were sold outside the district. The crop endures lesser soil fertilities than maize and beans, its major space competitors. There is no organised production or marketing of this crop, although assistance to farmers is available from the agricultural office. Due to the complexity of processing this raw material, it can only be handled by large corporations. No alternative options exist in the district.

2:1:1:5 Timber: No large scale commercial log production exists in the district on private land. A few hill-top afforestation clusters exist. These were initially owned by the local authority. More recently they were handed to the Ministry of Natural Resources. Most of the trees elsewhere are in scattered areas, having been competed away by cultivation. Where trees exist, they are far below the needs of widespread saw milling activity.

Log timber is obtained from nearby Mt. Kenya forest for the six saw mills in the district. The tress are on government scheduled land and may only be exploited with official licence. It is difficult to estimate the quantity available, but it is possible to say that with continued planting, the source is inexhaustible. The saw mills in the district split mainly lighter podo and cypress, while heavier logs and traditional comphor are obtained from Embu or Karatina.

Except for one saw mill at Kagumo (which was not functioning at the time of study), all the other five are located along the Embu-Sagana road. This suggests that proximity to market outside the district exerts strong influence on location decisions.

Timber as a raw material accounts for 21 activities in the district which is over 16% of all significant small scale industries. It

employs an estimated 60 people in production of timber and furniture. This stresses the importance of this raw material in the spreading of small scale industry for furniture and building construction components. Added to felling and transportation, the magnitude of this activity is really large. Utilisation by local saw mills is, however, neither very efficient nor comprehensive. It is estimated that usable timber recovery from logs is between 30-40%. 60-70% is wasted in slab s, cut-offs and saw dust. A 'modern' saw mill at Nyeri achieves recovery rates of 75-85%. (1). Slabs and cut-offs provide a source of cheap building material and wood fuel, but then in terms of raw material utilisation, these uses are sub-economic. Further, wide diameter logs can not be handled well by circular saws. These are the common tool of all the saw mills in Kirinyaga. Certain forms of log e.g. camphor, are not usually handled within the district due to their natural thicknesses.

It has been suggested that saw dust could further be treated with resin or some binder to make wood blocks. It could also be partially burnt to make fuel. There is however not enough of this dust for commercialisation and even then, competition from other forms of block or charcoal, seriously limit these potential uses.

A possible further extension of log wood industry in the district would be in ply-wood making. The industry has tremedous market potential in the packaging of tea and furniture making in the central area of Kenya. It has been mentioned that trees in Kirinyaga are of lower quality than that required, and much plywood has continued to be imported. It is impossible short of expert knowledge, to confirm this, but realising that tea industry, capentery and construction continue to demand more of this wood, it would be worthwhile to investigate more closely.

2:1:1:6 Maize and Other Grains:

Kirinyaga is a good maize producing district, especially Ndia and Gichugu Divisions where climatic conditions permit a bi-annual crop. In 1974, the district produced an estimated 50,000 tonnes of maize. Most of the maize is sold whole to markets outside the district, either through the Maize and Produce Board at Sagana or individual licences.

A little of the maize is milled locally by about a dozen flour mills. About half of these (see Fig 13) utilise relatively modern power sources - fuel or electricity, often the latter. They can handle about 90kg. in an hour. Their locations are therefore irrelevant to water power and are often in centres within reach of the maize producing belt. They may be regarded as a step towards more efficient location, and processing of maize. Other mills use more traditional methods, utilising water power and the grind stone. Hence their locations are irrelevant to growing centres as they demand free flowing water at a gradient. The rate of grinding varies, but averages about 10Kg./hr.

The extent of this raw material in the district, (and in the neighbouring Embu and Nyeri District from where procurement faces no transport difficulties) deserves better organised processing and faster mills, whose market reach would be wider. Arguments against sifted maize meal are often based on its low nutrition content (2). Its popularity suggests that it is easily a viable activity. It has also been argued that smaller scale processing of unsifted maize meal facilitates use of unsophisticated technology, which is more plausible. However, market demand, in absence of a definite campaign for whole grain flour, seriously limits the future for this industry. Dispersal of producing areas suggests possible locations at Sagana, Kutus or Kerugoya, in that order of attractiveness. Sagana is a logical convergence of

routes from a possible catchment area.

A further possibility for maize as a raw material is in the field of animal feed production. Not only the grain but also the comb left-overs, can be crushed for this purpose. Sifted maize production, crushing cotton seed and rice processing, are important ancillary processes to animal feed production. Location of such an activity depends on factors. Product distribution, procurement of ingredient, availability of electric power and nearby market demand would impart relatively more importance - of course given the space on which this should be carried out.

Other grains include millets of various types whose industrial importance is negligible. Some millets are however used in the preparation of "busaa" (a local brew) and a once popular "marwa" (with similar alcoholic qualities). These millets contend with other grains and cash crops for space, and expansion does not seem to be emphasised by local producers.

2:1:1:7 Other Agricultural Raw Materials:

The district produces a large quantity of vegetables (1500 tonnes cabbages in 1974 was estimated), beans (5072 tonnes in 1973), peas, cow peas, green grams, potatoes, carrots etc., especially in the better watered warm middle and cooler upper zone. In 1940's, sufficient quantities were produced to support a canning factory at Kerugoya. The factory was dismantled in early 1950's but its existence once, suggests potential for this level of activity. The venture was abandoned partly due to the insecurity of the owners during the struggle for independence, and the constraints on raw material sources, transportation etc. which the period experienced.

The farming pattern in the district has changed extensively

since then. Small holder coffee farming, better livestock raising and tea growing have increased. The basis for the vegetable raw material has been affected, but then the system has not completely destroyed the chances for growing vegetables. The bi-annual maize cultivation allows time for vegetable cultivation particularly during the season Une to September. Space would still be found close to the numerous rivers and streams and waterable higher level ground. Supporting factors such as government encouragement and advice, infrastructural services etc. have improved compared to the time the venture was abandoned - So have the social stability and investment security. This activity has potential in the district. Requirements of power, access, and services suggest a location with a fair amount of proximity to vegetable producing areas. Consequently, Kerugoya, Baricho and Kutus would seem to be favourable locations.

2:2:1 NON-AGRICULTURAL RAW MATERIAL:

Enterprises which deal in processing of non-agricultural raw materials show a characteristic tendency to locate at centres of higher population concentrations. These enterprises include carpentery, cobblery and tailoring which are common at Sagana, Kutus, Kerugoya, Kianyaga and Wanguru. They have been put under this grouping as their raw material sources, though initially of agricultural origin, reach them after some primary processing. In the same category are metal smiths and photographic activities.

Most of the raw materials required for these enterprises comes from outside the district (See Table 14. below). This is so because no local sources of these materials, (except sawn timber), are found. Their primary processes are sophisticated and sources are located for wider markets outside the district. Local demand is therefore insufficient to cause localisation of sources of these raw materials.

ACTIVITY	RAW MATERIALS SOURCE	ACTIVITY LOCATION	DESIGNATION
Capentery	Sagana, Kutus, Embu, Karatina and Nyeri	Kagumo Kutus Kagio Kerugoya Wanguru Sagana Baricho	Market Rural Market Urban Urban Urban Rural
Cobblery	Thika, Nairobi	Kagio Sagana Kerugoya Kagumo Kutus Kianyaga Wanguru	Local Urban Urban Market Rural Rural Urban
Tailing and Dressmaking	Thika, Nairobi Local	All Centres at varied levels	All Levels
Metal Smithing	Local Scrap, Nairobi Thika	Wanguru Kerugoya Kutus Sagana	Urban Urban Rural Urban
Photography	Nairobi, Thika	Kerugoya	Urban

Table 14: Non-agricultural raw material sources and activity Locations.

Source: Own Survey

It is notable that, these activities (except tailoring) are chiefly located at large centres. They are concentrated within the zone of higher population density, and better accessibility to areas outside the district, at Sagana, Kagumo, Kerugoya and Kutus. Wanguru has advantages from irrigation which are special in the area. This means they are strongly dependent on the purchasing power (the market) found in the high population concentration. Their tendency to concentrate at centres with better accessibility is a more complex issue. It

results from informal contact of these centres with other areas, the attractions of easier transportation and quicker procurement of raw materials and contact with customers.

Except for sawn timber, physical distance from sources of raw materials does not have a discernable influence on location. 8% of interviewees mentioned raw materials as a hindrance to expansion, but none mentioned that it had influenced their decision to locate where they were. Among these enterprises, availability of space featured prominently among reasons for their present location. Another reason was avoidance of competition from similar activities. This reason was given by all motor vehicle garages interviewed. Other activities did not indicate any competition, which suggested a satisfactory market situation exists.

2:2:2: SERVICE INDUSTRIES:

This group of activities utilises no raw materials in the conventional sense. Their prevalence is indicative of the level of activity among other enterprises. Their role is to service the technical elements in other activities like transport, tools, implements and household goods by way of repair. Their distribution is given in Table 15.

Motor repair is dependent on local vehicle ownership, and the volume of transit traffic. Frequency of repairs is indicative of the frequency of transit, income levels, conditions of vehicles and of roads. It is no coincidence that these activities are located on the main transit corridors e.g. Embu to Sagana, Embu to Thika and Kagumo-Kerugoya-Kutus. It terms of other considerations (except space), they are absolutely foot loose'. They are only limited in their location by availability of motor vehicles and space. The same may be said

ENTERPRISE	BUSINESS SOURCE	LOCATION	RANK
Motor Repair	Local and Transit Traffic	Kagumo Kerugoya Kutus Kagio Sagana Wanguru Mururi	Market Urban Rural Market Urban Urban Local
Cycle Repairs	Local Bicycle Traffic	Kerugoya Kutus Kagio Wanguru Kimbimbi	Urban Urban Rural Market Market
Welding and Repair	Local transport tools, implements hardware	Kerugoya Sagana Kutus Kagio Kagumo	Urban Urban Rural Market Market

Table 15. Location of "service industries" in the district Field Survey 1976.

Source: Field Survey 1976.

of bicycle repair enterprises. Local population densities have little influence on location of these activities. They locate on the basis of frequency of vehicular movement through and to an area.

Welding and general repair enterprises are in fact an off-shoot of motor repair activity. The fact that they also undertake welding almost any article is a factor of expanding coverage rather than an original objective. Except one owner who welds as part of a metal smith job, all the others are garage owners. Their distribution is therefore closely related to that of garages. They therefore do not select their locations as welding and general repair enterprises per se , but as garages.

To conclude, it is noted that small enterprises do not depend on raw material sources for their location. They are mainly dependent on the availability of a market which is a function of population, purchasing power, competition and accessibility. Producing Activities differ from servicing activities in the choice of locations, particularly because their markets are different. Space availability is a factor common to all of them.

Servicing enterprises heavily depend on accessibility and the level of other economic activities which determines the availability and wear of other implements.

Location is also partly determined by availability of infrastructure and community services. The most common of those are roads, railways, power, telephone, water and sewerages; and community services such as hospitals, schools, housing and recreation. These are dealt with under sec. 2:3 below. Their influence, coupled with that of the raw materials, gives a more balanced view of industrial dispersal in Kirinyaga.

2:3 INFRASTRUCTURE

2;3:0 GENERAL.

Widespread rural industrialisation requires equally widespread infrastructure to support it. The greater the dispersal of activities, the larger, in relative terms, the costs of infrastructure and a policy choice would have to be made between dispersal or concentration of activities. Since rural industrialisation is already a policy objective, the importance of infrastructural costs necessarily follows. These costs, both in money terms and social terms, may be minimised by careful selection of centres to be served, on the basis of their potential for industrial development and availability of infrastructure.

For purposes of locating rural crafts, light industrial trades etc., the influence of a general complex of infrastructure is not immediately discernable. Some of them e.g. capentery, metal smithy, cobblery etc. require sufficient electricity, an all weather road and water and little else. Due to the hierachy of industrial activities, three levels of infrastructure, have been identified. These correspond respectively to large scale sophisticated processes, middle level modern processes and rural crafts and small scale industries.

(a) Social service institutions, like schools, health facilities, housing, and recreation complement other infrastructure in stablising an acceptable industrial environment. They are demanded by large scale industrial concentrations with large numbers of personnel. Small scale industry on the level under consideration would hardly create extra demand to deserve special provision of any of these services. In the short run, current estimates would be enough provision of these services. In other words, lack of additional services is hardly inhibitive to the location of crafts and small scale industries

at a centre.

(b) This includes Infrastructure which forms transmission corridors of goods, raw materials and energy such as roads, railways, power and telephone lines, and water. Provision of these forms of infrastructure is often a matter for national decision and are usually provided through district and regional, rather than sub-district, networks. These have a strong influence on large and middle level activities and relatively less influence on location decisions of small crafts and trades - they are required in lesser amounts or less refined quantities. Table 16, read against Table 19 shows this. Among them, transportation

Division	Centre	Power	Postal	Telephone	Pipe Water	Sewerage	Tarmac	Rail
Ndia	Kerugoya	X	X	X	X		X	0
	Sagana	X	X	X	0	0	X	X
	Kagio	X	X	X	X	0	X	0
	Kanyokora	0	0	0	X	0	X	0
	Kibirigwi	X	0	X	X	0	X	0
	Baricho	X	X	X	X	0	0	0
	Kagumo	X	0	0	X	0	X	0
Gichugu	Mururi	X	0	X	X	0	X	0
	Kangaita	X	0	X	X	X	X	0
	Thumaita	X	0	X	X	X	X	0
	Kutus	X	X	X	X	0	X	0
	Kianyaga	X	X	X	X	0	X	0
	Mukarara	0	0	0	X	0	0	0
	Ithareini	X	0	0	X	0	X	0
Mwea	Murinduko	0	0	0	Proposal	0	0	0
	Wanguru	X	X	X	X	0	X	0
	Kimbimbi	X	0	X	X	0	X	0
	Kandongu	X	0	X	X	0	X	0
	Mutithi	X	0	X	X	0	X	0

Table: 16 Distribution of basic infrastructure.

Source: Own survey.

is noted as the most crucial determinant, particularly for enterprises procuring raw materials from outside their immediate location and/or distribute their products similarly. Such activities include saw milling, flour milling, coffee and tea factories, the rice mill and the ginnery. Activities like cobblery, capentery, joinery and metal simthy in their small scales, suffer from lack of water, additional power and transport.

(c) Finally, local infrastructure such as town or village sewerage, local water supply, parking areas and public pavements seem to determine site selection for small scale industries and crafts. They impart influence mainly in terms of site services and customer accessibility. These activities sell to customers direct without middlemen. Enterprises which sell in non-local markets suffer from lack of these facilities at the site - in most cases, they have provided their own services e.g. Kangaita and Wanguru factories "have provided" their own water supply, electricity and telephone. Public pavements, parking, and water supply were available at over 25% of the centres.

In the larger centres, influence of these infrastructure was not clearly determinable. Site availability was paramount, and not site quality. What now follows is an examination of distribution and influence of basic infrastructure as they may have affected location of existing activities, so as to identify areas of lower cost industrial potential. Comparison of Table 4: :3 (Appendix) - Activity Distribution, shows possible influence of infrastructure on existing enterprises.

2:3:1 ROADS NETWORK

The district road network is one of the densest in the country, especially in the northwestern half of the district and the middle section of the middle zone. In a horse-shoe shape, the eastern parts of the district are less well served by murram and metal roads. Overall district accessibility has been facilitated by Embu - Sagana and Karatina - Sagana Roads, with a secondary tributary between Karatina, Kerugoya and Kutus. A short-cut tributary, which may finally become a primary road, runs southwards from Mururi to Makutano (3). Along these four roads is located the major service centres- three urban centres, one rural centre and five market centres.

The greater number of external market oriented process [15] closely related to all weather road availability. Some activities have attracted all weather roads. The cotton and rice mills were located before the tarmac road- so were the repairs and capenters activities in Kerugoya and the saw mills at Kutus. The deduction from this is that road improvement has been spontaneous and in some cases e.g. the Tea Factory Project, has been a necessary component of the factory project. It is notable that 92% of the present processing activities (except for coffee factories and tobacco curing) are on all - weather roads. The importance of communications and transport in particular, is not disputable where markets and raw materials are to be reached in scattered locations. The United Nations Seminar on Industrial Estates in Africa has emphasized the importance of transportation in these words :-

> "However advantageous the physical characteristics of a site, if it cannot be conveniently reached by one of the major means of transport, its value will be greatly reduced for industrial purposes." (4)

In Kirinyaga, the most important means of transport is the motor vehicle, as no bulky commodities are produced (5) The areas which are relatively inaccessible (see Fig.9) are therefore of little industrial

potential. In section 1:3:1, it was noted that these areas are comparatively sparsely populated and one areas, Gichugu Division, suffers emmigration.

Fig.9 illustrates the impact of the road system on the existing settlement pattern. The higher the road concentration, the denser the settlement pattern. Alternatively the greater the population concentration (which reflects land output capability), the more satisfactory the level of accesibility and the greater the potential of an area for industrial location. In terms of intra-district trade, this zone is connected more effectively with the neighbouring districts. Relative to the road system, activities oriented to local markets are at points with a good customer base, which are also well served by the road network. The activities which confirm this observation are shoe making and repair, flour milling, capentery, joinery, and tailoring. Their locations are explained more from the number of people frequenting the 'market' centre rather than on the availability of an all weather road.

It may therefore be concluded that all weather road services are important to firms which sell to external markets. Their general level of mechanisation and sophistication is higher than that of the local - market oriented activities. Activities like motor and bicycle repairs are a direct function of the efficiency of the roads. It is not possible to categorise them as local - or external-market oriented.

It is relevant at this point to mention that the roads' target of the Ministry of Works is closely related to the "designated service centres policy." The hierachical organisation of service centres is related to the hierachical classification of roads. Each level of road links a graded centre.

Table 17: below illustrates this point. If all weather road availability,

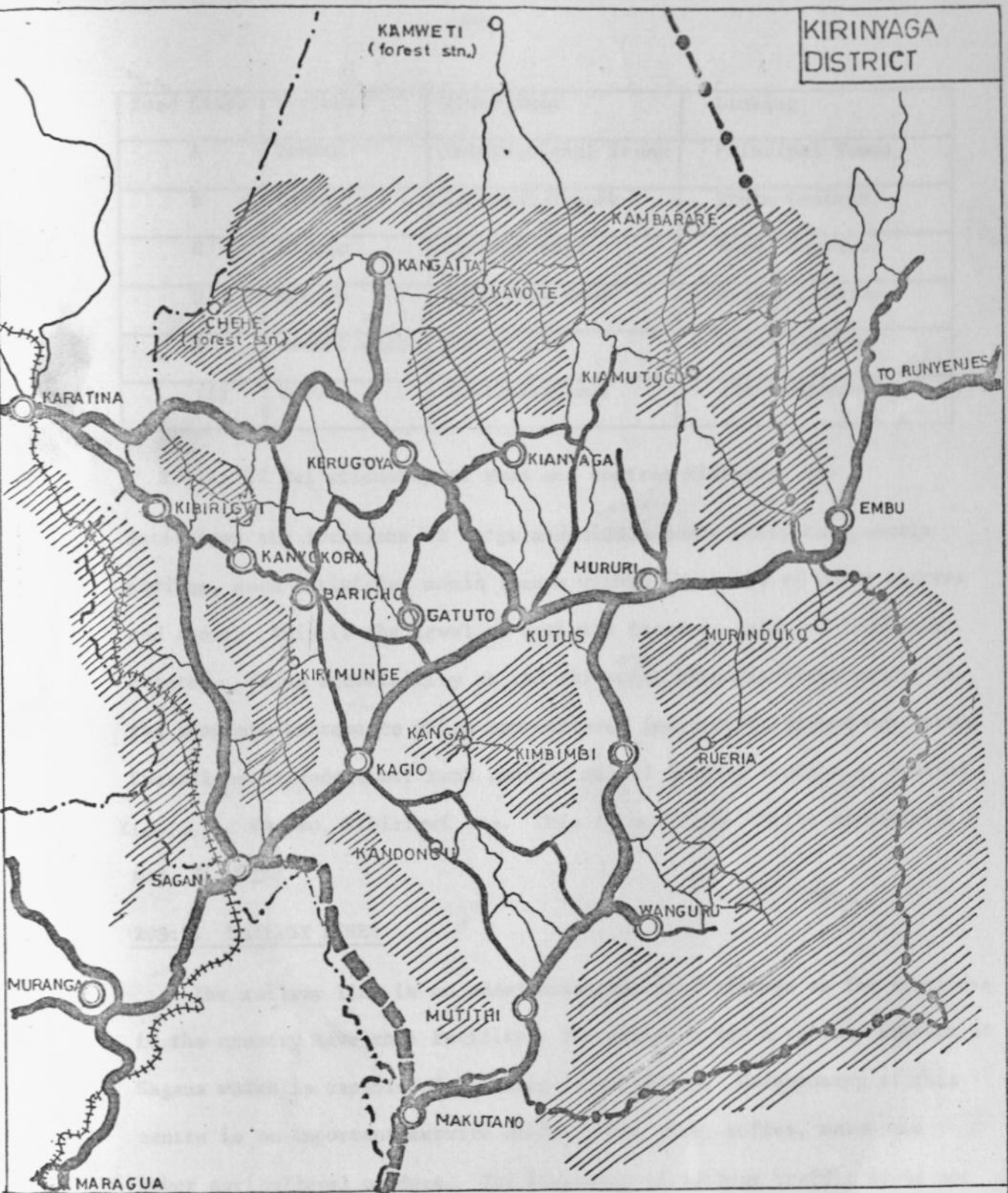


FIG. 8. SUPPORTING INFRASTRUCTURE— ROADS & RAILWAYS

LEGEND

- Tarmac Roads
- Marrum Roads
- Earth Roads
- Relatively Inaccessible Areas. (more than one km. from all weather rd.)
- Railway Line
- All Weather Road Served
- Earth Road Served
- District Boundary
- Provincial Boundary

0 5 10 Km.

N

Road Class	Surface	Class Name	Linking
A	Tarmac	International Trunk	Principal Towns
B	Tarmac	National Traunk	Urban Centres
C	Tarmac	Primary road	Rural Centres
D	Murram	Secondary Road	Market Centres
E	Graded earth	Minor road	Local centres
(f)	Earth	(Unclassified)	(Undesignated)

Table: 17 Rellationship of road and centres Hierachy. (6)

determines the locations of large and middle scale activities, cetris paribus, such activities would locate within the range of rural centres and above. This is the level of activity found in existing industrial estates. Using accesibility as the criteria, then the rural centre is the absolute extreme to which conventional industrial estates may reach. Exceptions include lower rank centres on all weather roads e.g. Mutithi, Kimbimbi, Kagumo, Kibirigwi etc. This is reflected on the accessibility map, Fig.9.

2:3:2. RAILWAY LINE:

The railway line is an added advantage to Kirinyaga as few districts in the country have this facility. The district has a railway station at Sagana which is capable of handling bulk produce. Warehousing at this centre is an important service activity for rice, coffee, maize and other agricultural produce. The frequency of railway traffic would not a llow transportation of perishable commodities.

Some of the products suggested in this study, like animal feed, mattresses, maize meal and plywood would easily take advantage of the warehousing and railway service. Prospects for extending the line into the district, judging from likely demand are slim. Sagana is therefore likely to remain the acceptance and delivery centre for commodities

transported by rail.

2:3:3. ELECTRICAL INFRASTRUCTURE:

Electricity has been available to the district for a long time. There has been a transformer at Sagana and Kutus. What seems to be the hindrance to distribution is the low level of demand. The supplier .. supplies on commercial grounds only. Recently, the government has launched a rural electrification programme to subsidise uneconomic conconections. (7) While this is being done, it is anticipated that added rural activity will pitch demand to make the programme self-supporting. Rural electrification will therefore be subsidised initailly, not indenfinitely.

To be of assistance to rural industrialisation and service centres policy, rural electrification should be carried out so as to conform to the hierachy of settlements. Like the roads projects, digression to specific projects outside the designated centres should be an exception only. Hence, industry located at centres which are selected for their combined service and industrial potential would benefit more from the added advantage of subsidised electricity connection.

Demand for electricity reflects changing attitudes on the existing technology. It implies modernisation of production tools in some instances and possibilities for faster production in others. The fact that about 20% of the interviewees indicated desire for electric power, reflects that there is a growing new gneration of enterprises which demands new approaches to production. These enterprises were preceded by a modernised agro-processing activities, such as cotton ginning, rice milling, tea processing and saw milling. These are reltively modern and produce for wider based markets.

In determinating locations, electricity, like roads, would be

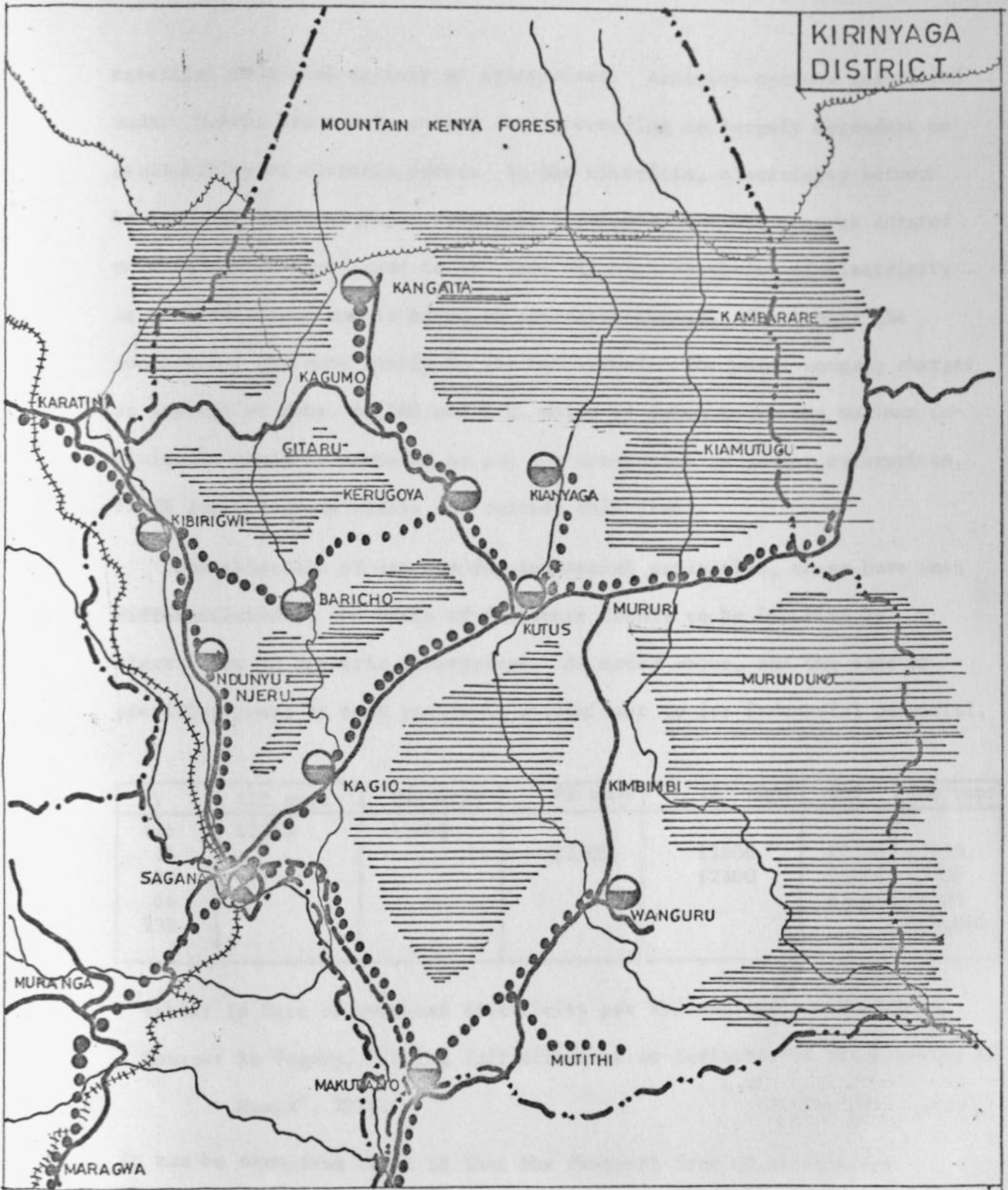


FIG. 9 : DISTRIBUTION OF ELECTRICAL SERVICES

Transformer available

Electricity available

Electricity lines

Areas outside reasonable connection costs i.e. K£3000

Scale 1: 250,000

km 0 5 10

N

essential to a wide variety of enterprises. Activity options identified under 2:4:0. leave only animal feed processing as largely dependent on availability of electric power. In the districts, electricity network has roughly followed major transport corridors, and all centres located on main routes have acces to it (see Fig.9). Provision of electricity is commercialised and is based on effective demand. The longer the connection, the more costly to the individual. The power company charges an average of Kshs. 60,000 per K m. which is taken to be the maximum individuals would be prepared to pay for connection to larger enterprises. Fig.10 depicts areas within and outside this limit.

For selection of centres for industrial activities, these have been differentiated on the basis of influence likely to be imparted by electricity on specific enterprises. As noted above, and the ease of providing power at each centre is determinant to its industrial potential.

KV	123 amps	204 amps	82 amps	123 amps	204	286 amps
415	£1250	£1900				
11			£1500	£1800	£2500	£3200
33				£2300	£3000	£3700
66					£5000	£6500
132						£10,000

Table: 18 Cost of overhead electricity per Km. excluding transforers.

Source: Bo Vagnby, " Using Infrastructure as Indicator of Urbanisation in Kenya", 1976.

It can be seen from Table 18 that the cheapest form of electricity connection (without transformers) would be the 415 KV and 123 amps connection. This is however rarely used in distribution networks. Most networks carry 33 KV. which is usually stepped down to 11 KV. for use (8)

Consequently, cost of electricity connections to areas of either low potential use or long distances may only be done at subsidised rates. National rural electrification programmes are being launched to cover areas.

2:3:4. WATER SUPPLY

Water for industrial development may be classified in two ways. Firstly, water utilised as an industrial input and which makes an ingredient of the product or an important part of the process. For this use e.g. brewing, mineral water bottling, baking and milk processing, relatively large quantities of water are required for setting up an enterprise at a place. Secondly water is necessary for human use, fire fighting etc. either at the place of business or residences. For these uses, relatively small quantities are required as water is not consumed as part of the process.

Relatively few rural small industries required water for the first purpose. Baking, mineral water bottling, coffee processing and local brewing activities are exceptions. Most of these activities require water for ancillary purposes as their final products are "dry" products. e.g. timber, flour, rice, cotton, metal frames, tea or shoes. Consequently, large quantities of water are not determinant on location. Requirements for water for such activities are included in the normal water demand calculations for the centre. Where water is provided (see Fig. 11), calculations are based on 20 gall/person/day (about 120 litres) for 'urban' areas, and 100 gall (about 600 litres) per family in rural areas. On this basis, most of the district shall be covered by one or the other of the water supply schemes. There has been two separate types of schemes - urban (or trade centre) schemes, and the more recent rural schemes.

The more important, and functioning, urban schemes cover Kerugoya, Wanguru, Kianyaga and Kabare. More recent schemes are designed to be more comprehensive - taking in parts of rural areas, e.g. Inoi and Ngariama Schemes. There have been several private water projects in Mwea, Kandongu and Kangaita which are associated with specific uses.

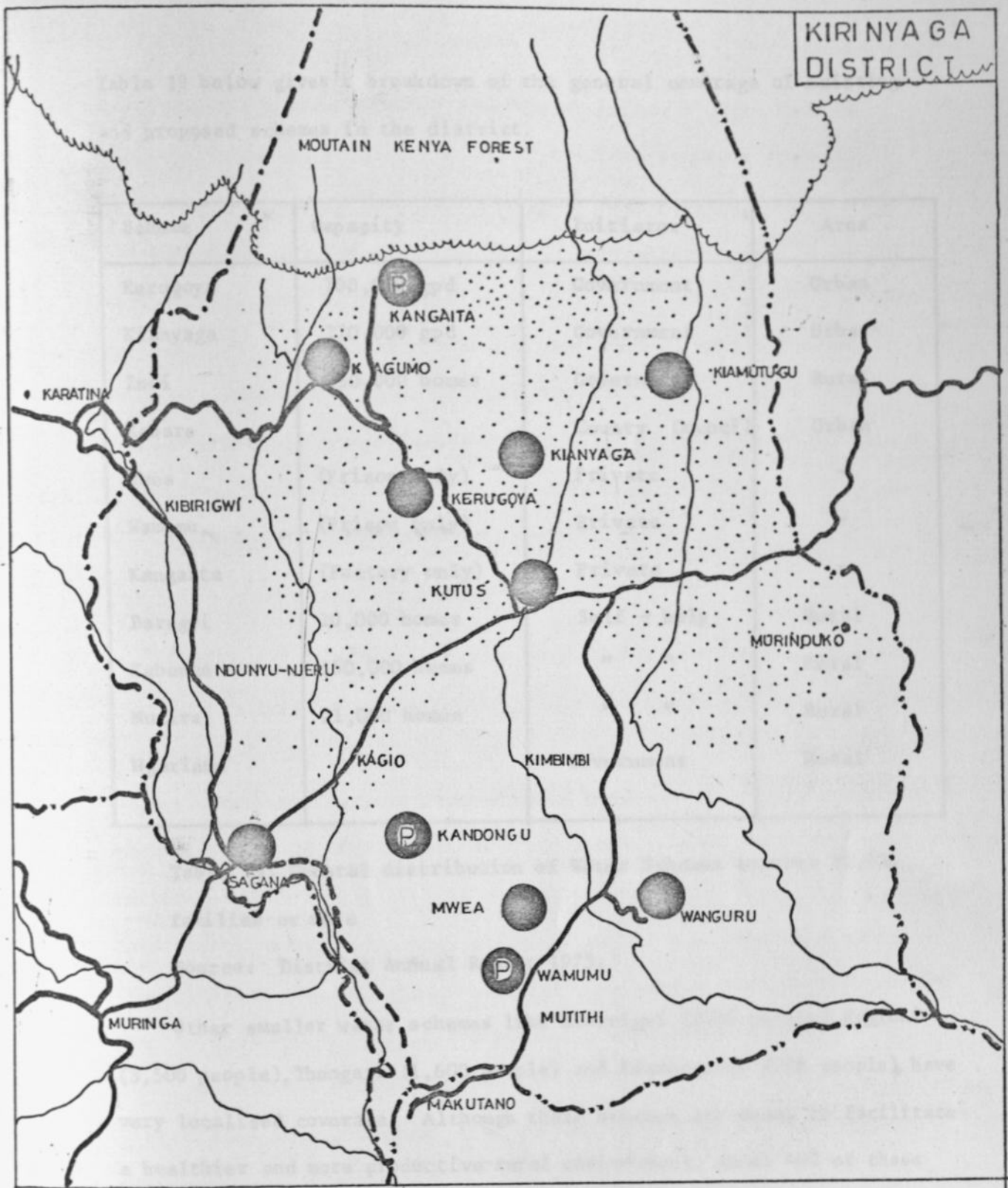


FIG 10 WATER AVAILABILITY

P Private institutional supply

Local urban supply

Rural water projects

Scale 1 250 000

km.

0 5 10

N

Table 19 below gives a breakdown of the general coverage of existing and proposed schemes in the district.

Scheme	Capacity	Initiator	Area
Kerugoya	700,000 gpd	Government	Urban
Kianyaga	170,000 gpd	Government	Urban
Inoi	250,000 homes	Government	Rural
Kabare	-	County Council	Urban
Mwea	(Prison only)	Private	-
Wamumu,	(Prison only)	Private	-
Kangaita	(Factory only)	Private	-
Baragwi	10,000 homes	Self - help	Rural
Kabonge	150,000 homes	" "	Rural
Mutira	21,000 homes	" "	Rural
Ngariama	-	Government	Rural

Table 19: General distribution of Water Schemes serving 10,000 families or more

Source: District Annual Report 1973.

Other smaller water schemes like Kibirigwi (2000 people), Kagioni (3,500 people), Thungari (1,600 people) and Kiambagathi (228 people), have very localised coverage. Although these schemes are meant to facilitate a healthier and more productive rural environment, about 40% of these contacted did not see the schemes as useful for industry, probrably because industrial production to them is a "dry process."

2:3:5. SEWERAGE AND DRAINAGE

Sewerage and storm water drainage in most centres in the district have not been extensively developed. In fact, pit latrines and septic

tanks are the common forms of sewerage at larger centres such as Kerugoya, Kutus and Wanguru. A sewerage scheme is under consideration for Kerugoya. Larger industrial projects e.g. Wanguru cotton ginnery and Rice mill, and Kangaita Tea Factory have organised their own sewerage. This, considered alongside the fact that other activities have thrived in absence sewerage, implies that lack of sewerage need not necessarily play down other location considerations. Where other factors prove attractive, sewerage can be developed specially. Since no sewerage exists in any of the centres, then the influence of this on the existing activities is not discernable.

2:3:5. POSTAL AND TELEPHONE:

Postal and telephone services perform functions which are difficult to relate directly to industrial performance or industrial type. All industrial activities utilise either or both to a greater or lesser extent. Larger enterprises however would need both in larger quantities. In fact levels of utilisation may indicate levels of activity, sophistication in marketing, procuring and the general conduct of business. Larger enterprises would demand more efficient and less informal means of communication (9). Of some 6 activities employing more than 20 people, four of them had telephones and private postal boxes. Consequently the level or need for outside contact for raw material procurement or product distribution will determine whether postal and telephone services are fundamental to location. Personal contact to a large extent emphasises need for agglomeration. The telephone facilitates such contact with lessened effects of the physical distance and to some extent alleviates concentrative forces. From field observation it is deduced that telephone availability within an enterprise is indicative of external connection and a certain level of sophistication in procurement and marketing

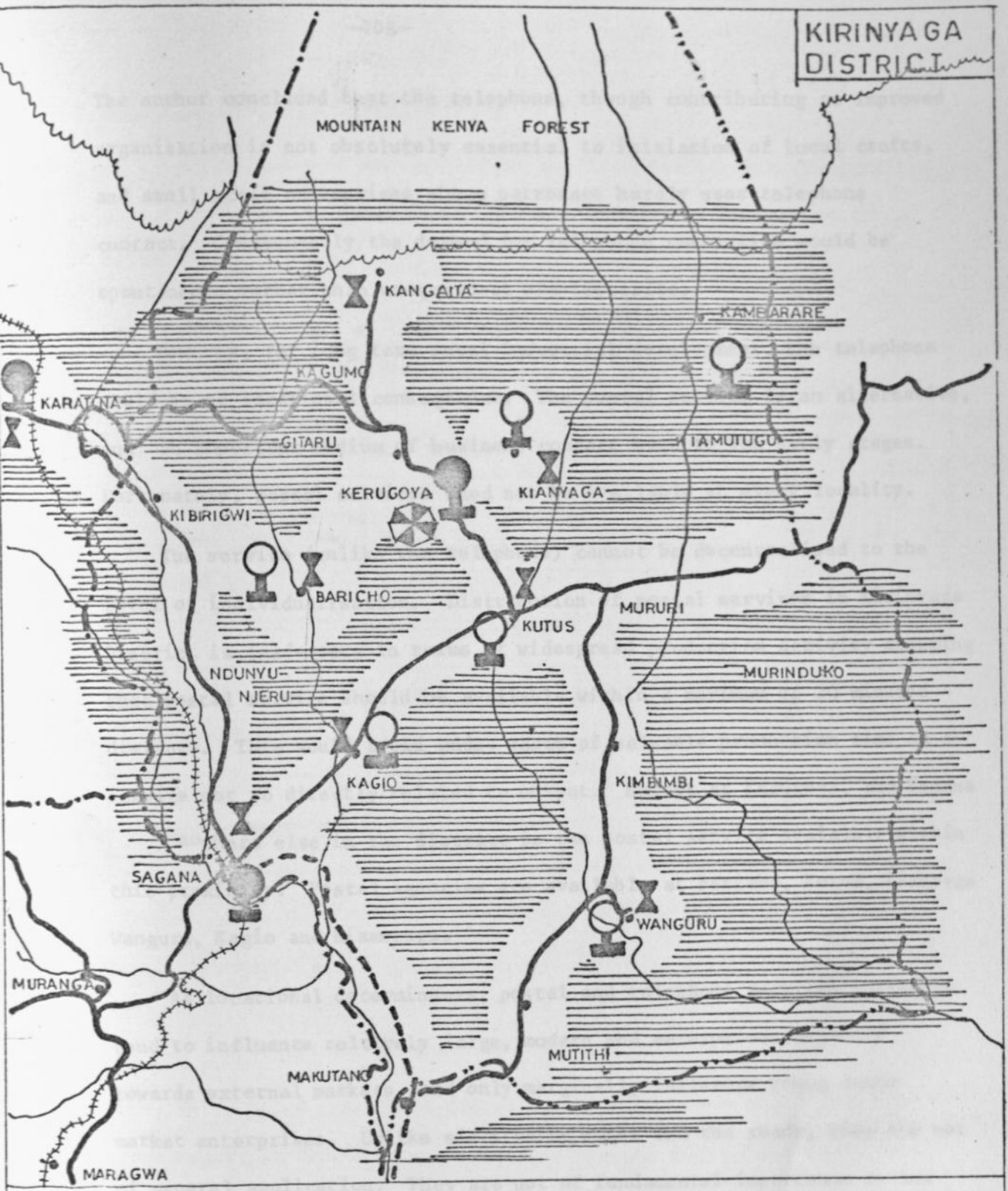


FIG.11 : DISTRIBUTION OF POSTAL AND TELEPHONE SERVICES

Post Office

Postal Agency

Telephone Exchange

Available Telephone Service

Areas outside reasonable cost distance from existing lines.

Scale 1: 250,000

km 0 5 10

N

The author concluded that the telephone, though contributing to improved organisation is not obsolutely essential to initiation of local crafts, and small scale enterprises whose patronage hardly uses telephone contact. Consequently the demand for telephone connection would be spontaneous rather than unequivocal pre-requisite.

However, for long term rural industrial development, the telephone would be of locational consequence. The postal service is an alternative, and an important medium of business contact even at the early stages. Fortunately, postal services need not be available at every locality.

The service (unlike the telephone) cannot be decentralised to the level of individualisation. Distribution of postal services in Kirinyaga District is inadequate in terms of widespread production activity assuming that postal service should be available within a maximum of 30 minutes distance. This would avoid undue waste of valuable production time an a service not so directly related to output. Except at Kerugoya, and Sagana nowhere else in the district is the postal service avaialble within this proximity. Postal agencies are available at Baricho, Kutus, Kianyaga Wanguru, Kagio and Kiamutugu.

As locational determinants, postal and telephone services therefore tend to influence reltively large, modern and enterprises oriented towards external markets, and only marginally influence young local-market enterprises. Unlike electricity, water and the roads, they are not of general application. They are not of fundamental importance to low level activities. With electricity, water and sewerage, they have been partly determinant on selection of centres to be designated (10). It is apparent, however, judging from the existing activities (see Table 22), and the above argument, that they are only partially determinant to location of existing activities.

2:3:7. LOCATIONAL CONSEQUENCES.

The influence of infrastructure on location of industries of the levels found in Kirinyaga District may therefore be summarised as below.

Infrastructure	Description	Effect on activity		
		Large	Medium	Small/Crafts
Roads	All Weather	X	X	0
	Seasonal	0	0	X
Electricity	Individualised	X	0	X
Water	For Processing	X	X	0
	For Consumption	X	X	X
	Individualised	X	0	0
Postal Office	Communal	X	0	0
Telephone	Individualised	X	0	0
Social Services	Communal	X	0	0

Table 20: Locational Influence of Infrastructure.

Source: Own survey.

X = Positive locational effect.

0 = No noted locational effect.

It is noted that about 50% of the infrastructure which feature prominently in deciding on central places, are of no direct locational effect on medium and small scale industries. This is so because their availability is more in line with service centre needs (as most of these centres are for administrative services) and not for manufacturing needs. If therefore, rural industrialisation is to locate large and medium scale activities in this area, the service centres at which this could be done are clearly identifiable. Location outside these centres

requires overcoming pecific thresholds at additional costs. The new locations would exert definite influence on the settlement pattern, thereby calling for rescheduling of resources allocation in land, funds and labour. Hence, on the basis of extra infrastructural costs, large and medium schale activities would be recommended initially within the shaded zones in Fig. 14.

Traditional crafts and artisan trades, noted above to be more footloose in terms of available infrastructure, could be located within and outside this shaded zone. At least water, accessibility and probability of electric connection are there in these areas. If infrastructural costs have to be incurred within this area, it is necessary to categorise infrastructure by the way it would be provided. There is that category of infrastructure that can only be provided in large amounts due to the technology and economies of scale involved e.g. over-all water supply system, sewerage works, roads, electricity networks, land reclamation, schools, hospitals etc. The excess capacity is incapable of immediate utilisation. This results in frozen capital and costs in terms of alternatives foregone. There is also that category of infrastructure capable of being provided in small units such as individual site services, short electricity and telephone connections, frontage roads etc. These involve little, if any, frozen capital and favour areas where networks already exist and activities which do not vitally require them to select a location.

Three phases of industrial development have been identified. First, the traditional crafts and artisan trades, capable of locating at all levels of central places hierachy. These are less rigid in locational requirements. Consequently their infrastructural demands are less. They have been assisted (where they have been) as individual umits and not as "small industry systems". They are widely found in the district in the district in the form of tailoring, cobblers, etc. (see Table 4 ;3).

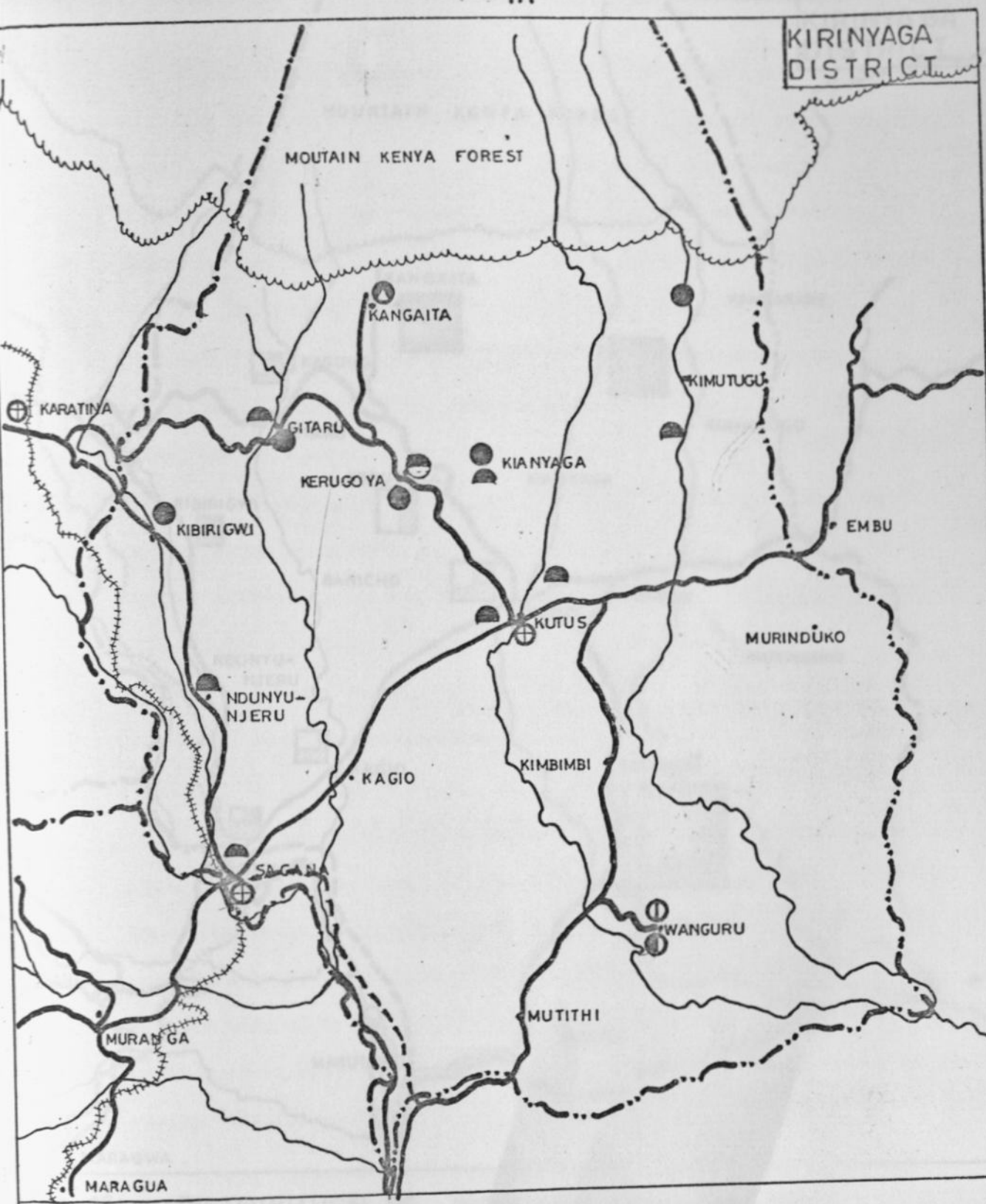


FIG. 12: DISPERSAL OF CASH CROP BASED INDUSTRIES

- Rice Milling
- Cotton Ginning
- Saw Milling
- Tea Processing
- Coffee Processing
- Flour Milling

Scale: 1:250,000
km.
0 5 10

N

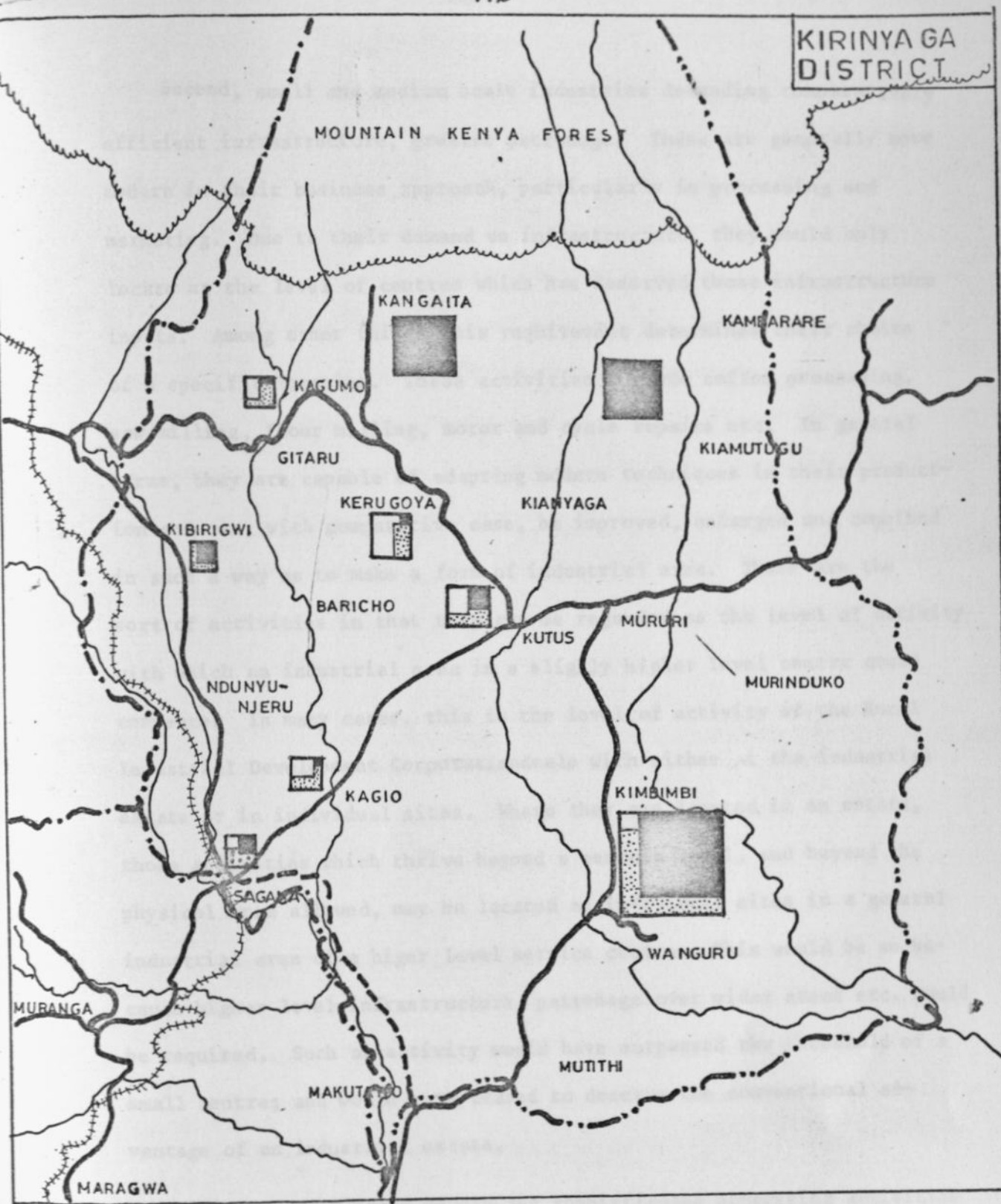


FIG. 13: DISTRIBUTION OF INDUSTRIAL AND CRAFTS EMPLOYMENT IN KIRINYAGA DISTRICT.

Second, small and medium scale industries demanding comparatively efficient infrastructure, greater patronage. These are generally more modern in their business approach, particularly in processing and marketing. Due to their demand on infrastructure, they would only locate at the level of centres which has deserved those infrastructure inputs. Among other things this requirement determines their choice of a specific location. These activities include coffee processing, saw milling, flour milling, motor and cycle repairs etc. In general terms, they are capable of adapting modern techniques in their production and can, with comparative ease, be improved, enlarged and combined in such a way as to make a form of industrial area. These are the sort of activities in that they can be regarded as the level of activity with which an industrial area in a slighly higher level centre could commence. In many cases, this is the level of activity of the Rural Industrial Development Corporationdeals with either at the industrial estate or in individual sites. Where they are located in an estate, those activities which thrive beyond a certain level, and beyond the physical area allowed, may be located on individual sites in a general industrial area of a higer level service centre. This would be so because higher level infrastructure, patronage over wider areas etc. would be required. Such an activity would have surpassed the threshold of a small centre; and would have ceased to deserve the conventional advantage of an industrial estate.

Third, larger scale modern and sophisticated processing activities demanding efficient infrastructure and often capable of organised provision of these infrastructure where it is unavailable. Goods and services produced by these activities are not available for consumption within the district except through further processing or middlemen. In this respect, the activities do not have direct benefitial effects on the

community apart from employment and proximity to market for raw materials. There are three examples of this category - the rice mill, the cotton ginnery, and the tea factory. These have located at two points, neither of shich had general industrial advantage prior to their location and have attracted necessary infrastructure and a resident population. This has influenced decisions to "locate" an important central plce in at least one of them - Wanguru "Urban Centre." The location process has been reversed in this respect with the industry determining settlement location - a consequence of resource influence. Later urban plans for this centre have shown site areas of these processing activities as industrial areas in a predetermined manner. The location consequence of these processes is to activate further settlement. Chains of activities have resulted from community demands.

The following Chapter deals with the sort of industrial and settlement pattern which arises from the interaction of the activities, infrastructure, raw materials and topographical factors of Kirinyaga District so far discussed.

Foot Notes

1. A modern saw mill at Nyeri achieves 75% wood recovery from log.
2. See Maholm Harper "Sugar and Maize Meal, cases in Inappropriate Technology" IDS Working Paper No.170, Nairobi University 1974.
3. This road may later be metal surfaced to link with Thika The Section in Kirinyaga from Embu is tarma.
4. U.N. Publication "Industrial Estates In Africa" 1965 page 20.
5. Ibid. Pages 20 -21
6. This is a bit idealised as small local centres are linked by tarmac high class roads e.g. Kimbimbi and Makutano.
7. See Kenya National Development Plan 1974 - 78, Government Printer, 1974.

8. These facts are obtained from E.A. Power and Lighting Company, December 1975, Nairobi.

9. All the factories oriented towards markets outside Kirinyaga district had telphone connections.

10. The Physical Planning Department, Kenya schedule of designated service centres, 1974.

11. For a detailed explanation of this classifcation, see Kozlowski, "Threshold Analysis" Architectural Press, London 1974.

3: SYNTHESIS AND CONCLUSIONS

3:I: SYNTHESIS:

3:1:1: CO-ORDINATION OF INDUSTRIAL AND SETTLEMENT POLICY:

Description and discussion found in Chapter 2:1, 2:2, and 2:3, finds an important common denominator in the concept of spatial location. National policies on rural industrialsation and settlement dispersal have both been shown to be closely connected to specific attempts to situate human activities in selected areas. It is clear that the success of both or either depends on the economic factors pertaining at the place of location. Hence it has been found necessary to synthesise these two in terms of their identified economic interdependence and claims on the resources avaialble. It has also been found necessary to highlight the more important conclusions of the "Location Theory" and to see how far these apply to Kirinyaga District. Thereafter an alternative method of reaching at a co-ordinated location decision, given the situation existing, has been discussed.

'Location Theory' attracted interest from both geographers and economists in the late 19th century, and literature on the subject increased in volume and depth in the first half of 20th Century. Prominent names initially included such economists as Wilhelm Launhardt (1882) and 1885), Alfred Weber (1909), Tord Palander (1935), Eddigar Hoover (1937) and lately. August, Lösch (1954), (1). The basis of their argument is chiefly the economists' concept of the equilibrium situation seen in relationship to a criterion of sales maxinisation.

It is not found necessary to detail out the work of these writers here. It is only possible to point out their fundamental conclusions, especially in as far as these have a bearing on location of either rural industries or rural settlements. The possibility of utilising

"location theory" as a medium for co-ordinating these two has also been examined. Earlier versions of the theory regarded locational decisions as a reflection of costs as compared to proceeds from sales. Hence procurement costs (materials etc), processing costs (labour, machinery etc), delivery costs (transpport, trans-shipment etc) and marketing costs (promotional and advertising), were all to be measured against the sales volume at a point. This would help in deciding on a suitable location that minimises the total of the former, and maximises the later. In the case of a "shared market" therefore, it was concluded that the boundary of markets for two enterprises would be at the point where transport costs would equate the prices of their commodities, *(2). This is the point where their sales are maximised in the circumstances.

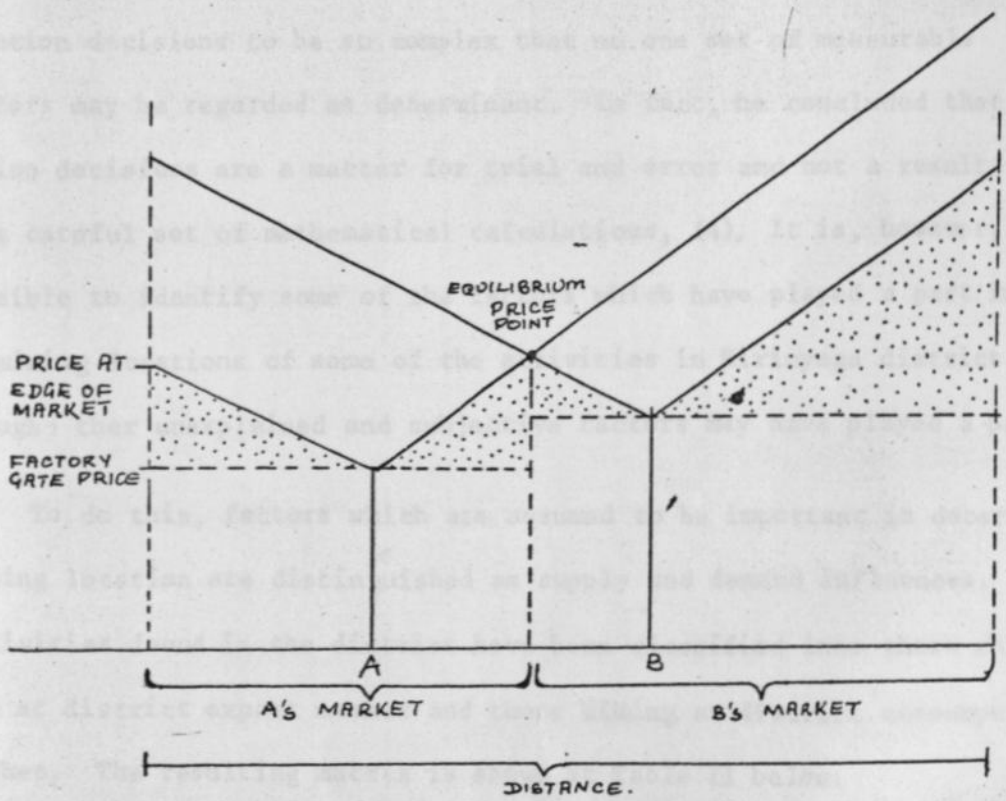


Fig. 14. Cost Rationale for Location.

This would reflect ıe effects of marginal transport costs on marginal sales and bear on the assumption that consumers are not partial to substitutable products or services.

Further work on the theory Eddigar Hoover 1948) revealed that the concept of diminishing returns is also involved and pointed out that transport costs vary over distance and by mode - falling over distance if rail and sea transport are used, but rising over distance when air or road and trans-shipment are introduced. He also noted that market demand was not inifinitely elastic and constituted another limitation to sales volumes within a location. Consumer partiality, purchasing power and tastes influenced total sales irrespective of commodity price (3). Former exponents had tended to regard costs (supply determinants) as paramount and considered demand aspects as insignificatnt or as given.

With further development of the theory, August Losah 1954, portrayed location decisions to be so complex that no one set of measurable factors may be regarded as determinant. In fact, he concluded that location decisions are a matter for trial and error and not a result of a careful set of mathematical calculations, (4). It is, however, possible to identify some of the factors which have played a part in determining locations of some of the activities in Kirinyaga district, although ther unexplained and subjective factors may have played a part.

To do this, factors which are assumed to be important in determining location are distinguished as supply and demand influences. Activities found in the district have been classified into those which aim at district export market and those aiming at district consumption market. The resulting matrix is shown at Table 21 below:

	Export Market				Local Market	
Supply Limitations	Rice mill	Cotton	Tea	Coffee	Saw mills	Crafts/Trades
1. Availability of Materials	X	X	X	X	X	X
2. Proximity to consumer	0	0	0	0	X	X
3. Processing costs (labour)	X	X	X	X	0	0
4. Delivery costs	0	0	0	0	X	X
Demand Limitations						
Product accessibility	X	X	X	X	X	X
Substitutability	0	0	0	0	X	X
Consumer tastes	0	0	0	0	X	X

Table 21: Effect of basic economic factors on Location.

Factors which have effect on the sales or the amount of goods available are marked 'X'. Those without effect are marked '0'. It is notable that activities which aim at consumption in the local market also show a greater "diversity" - the total number of different activities at a centre divided by the variety in the district as a per centage. Thus 'export' market processes, though large and employing many people do not indicate the level of product variety demanded in various areas. (see Table 22 and Fig 15). This diversity is taken to illustrate demand for products in various areas of the district, and indicates nature of service/commodity sold.

Division	Centre	Estimated Employment	Activities	Diversity.
Ndia	Kerugoya	55	22	50.0
	Sagana	33	9	33.0
	Kagio	34	11	34.0
	Kanyokora	4	1	5.5
	Kiangai	1	1	5.5
	Kibirigwi	24	4	16.7
	Kiine	2	1	5.5
	Baricho	5	3	11.1
	Kagumo	31	15	50.0
Gichugu	Mururi	8	3	16.7
	Kangaita	120	1	5.5
	Thumaita	102	2	11.1
	Kutus	57	27	44.5
	Kianyaga	9	4	22.2
	Mukarara	17	2	11.1
	Kiamugumo	15	1	5.5
	Kiringa	15	1	5.5
	Ithareini	6	3	11.1
Mwea	Murinduko	6	2	11.1
	Wanguru	230	13	44.5
	Kimbimbi	5	2	11.1
	Kandongu	2	1	5.5
	Mutithi	5	2	11.1
Distirct	-	790	131	

Table 22: Relative diversity of activities between studied centres and employment.

Source: Own survey.

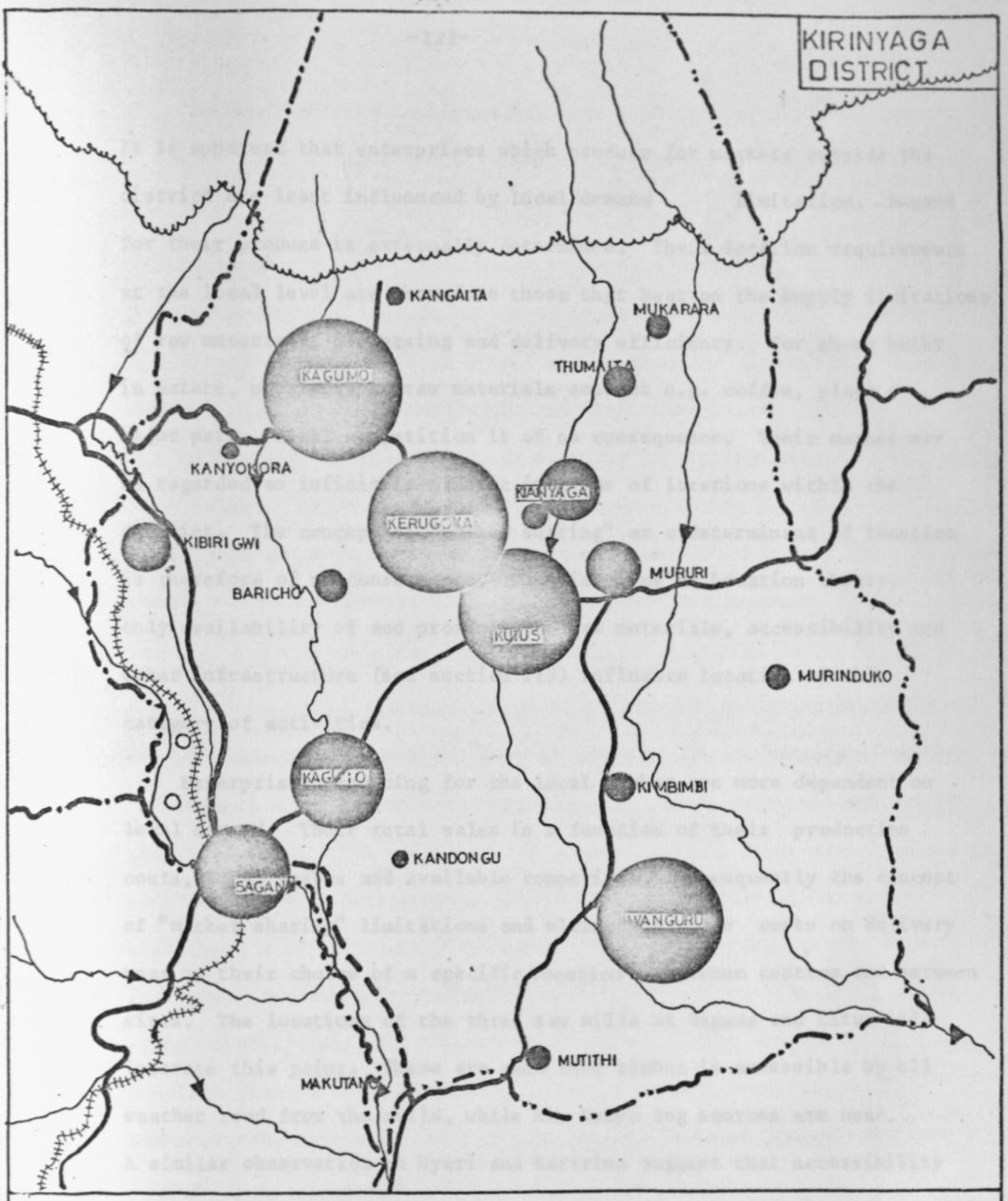


FIG. 15. ACTIVITY DIVERSITY = NO. OF DIFFERENT ACTIVITIES AT A CENTRE/ NO. OF VARIOUS ACTIVITIES IN KIRINYAGA %

It is apparent that enterprises which produce for markets outside the district are least influenced by local demand limitation. Demand for their produce is externally determined. Their location requirements at the local level are therefore those that bear on the supply limitations of raw materials, processing and delivery efficiency. For those bulky in nature, proximity to raw materials sources e.g. coffee, plays a major part. Local competition is of no consequence. Their market may be regarded as infinitely elastic in terms of locations within the district. The concept of "market sharing" as a determinant of location is therefore of no consequence. Thus in terms of Location theory, only availability of and proximity to raw materials, accessibility and other infrastructure (see section 2:3) influence location of this category of activities.

Exterprises producing for the local market are more dependent on local demand. Their total sales is a function of their production costs, local tastes and available competiton. Consequently the concept of "market sharing" limitations and ultimate produce costs on delivery bear on their choice of a specific location between centres and between sites. The locations of the three saw mills at Sagana and Kitus illustrate this point. These are such that timber is accessible by all weather road from the mills, while Mt. Kenya log sources are near. A similar observation in Nyeri and Karatina suggest that accessibility to sawn timber (mainly by road) strongly influences location of saw mills. Besides, patronage for this product is drawn from comparatively modern (as opposed to traditional agricutural) activities, e.g. construction and furniture making - activities often found in the zone where these are located. Smaller enterprises like wood workshops, metal smiths, shoe makers, motor repairs etc. exhibit similar location characteristics.

The quarrying and gathering building sand show strong relationship to raw material sources - the raw material being bulky and difficult to transport.

Locations of enterprises whose produce is not oriented towards a district market but towards sub-local consumers appear to be dependent on the total demand of their output rather than the limitations of cost on supply. No physical delineation of their market area can be made. They do not deliver their goods or services to the customers. Consequently no transport costs (of produce) are involved. Rather the customers fetch their goods or services from the place of production. Their 'market sharing' does not therefore fit into the Theory of Location.

Location decisions for such enterprises depend mainly on the total number of potential customers which is a function of the purchasing power of the community at a point. This is involves the consideration of the "Threshold" of an enterprise, which relates to the physical pattern of the settlements. The nature of the product and the level of demand for it at a point, would determine whether the location would be capable of sustaining a sales volume sufficient to make the project viable at that location. Consequently threshold population consideration is important, among other factors, in determining location. Other less quantifiable location determinants identified include the traditional place of business, the enterepreneur's attachment to his local area where he can look after his farm and family alongside the business and availability of space in which to carry on business.

Assuming these latter factors to be favourable, it has been possible to single out the following *
* determinants. They have been derived from an estimate of the following determinants.

3:1:2: EXISTING CONSUMER POPULATION:

The population of Kirinyaga District, in terms of its productive

capability and disposable income, represents the capability of the district to consume those goods and services produced for the local market. The population of the district is estimated to be growing at 3.2% p.a. reaching about 270,000 people in 1975, (5). This population is to be served by twenty seven local centres, ten market centres, three rural centres and three urban centres, (6). From figures obtained from the Physical Planning Department, Kenya, the service populations of these centres would be as in Table 19: below:

Centre Level	Estimated Service Pop.	No. of Centres	Pop. Served.
Local	5,000	27	135,000
Market	15,000	10	150,000
Rural	40,000	3	120,000
Urban	120,000	3	360,000

Table: 23 Service area population in Kirinyaga District

Source: Physical Planning Department, Kenya.

It is realised that due to tastes and income levels, the absolute numbers of people do not constitute the consumer patronage. Difficulties of obtaining an empirically confirmed estimate of this patrongage have forced the author to rely on an estimate based on comparative income groups in urban areas and a realisation that average income levels in rural areas are about half to a third of those in urban areas. On this bases, only about 30% earn about K£120 (7), and over, per year. These are assumed to form the core of industrial produce patronage. It is also assumed that relatively higher disposable incomes corresponds to comparatively favourable tastes for industrial goods and services.

On this basis, it is estimated that demand for rural industrial goods and services would be reflected from only 30% of the served population,

so that in the district studied this should relate to the settlement pattern as follows.

Centre Level	Estimated Patronage
Local	1,500
Market	4,500
Rural	12,000
Urban	36,000

Table: 24 Levels of estimated consumer patronage within service areas.

Source: Own estimate.

It is realised that these patronage estimates are closely related to forms of productive activities and will vary between area and area in accordance to relative per capita incomes from the respective activity. The uniformity of nearly 50% of the district's middle zone characteristics makes estimates fairly reasonable. In the lower zone, population sparsity and income levels make the estimates uncharacterisitc. This disparity may only be taken care of by more dispersed settlements sharing the avaialble patronage, which would defy requirements of reasonable travel - ling distances. It is however noted that most of the population concentration is in connection with the rice scheme and has similar dispersal characteristics to the upper and middle zone. The estimates apply to this area, and the middle zone.

Following from the patronage estimates, it is noted that activities with internal market orientation would locate in urban centres and below. The rate of consumption of their goods or services would find there, required threshold levels. It is not reasonable therefore, to locate internal market oriented enterprises at centres where customer

levels are incapable of sustaining such enterprises - i.e. below the rural centre level.

It is assumed a middle and small scale enterprise would be reasonably viable while earning upwards of Kshs. 1000/= (8) per month, in gross profits. Granted that customers would spend about 5% of their annual incomes on industrial goods and services (9) it is conclused that these levels of enterprises would be viable only in centres of Rural service levels and above. They would not find sufficient patronage below the rural centre level. Consequently only handicrafts and artisan trades would be sustainable in market and local centres. This conclusion is reinforced by the fact that infrastructural services available (or which would be made available at this level without undue costs and frozen capital inhibitions) do not permit high levels of activity sophistication at market and local centres.

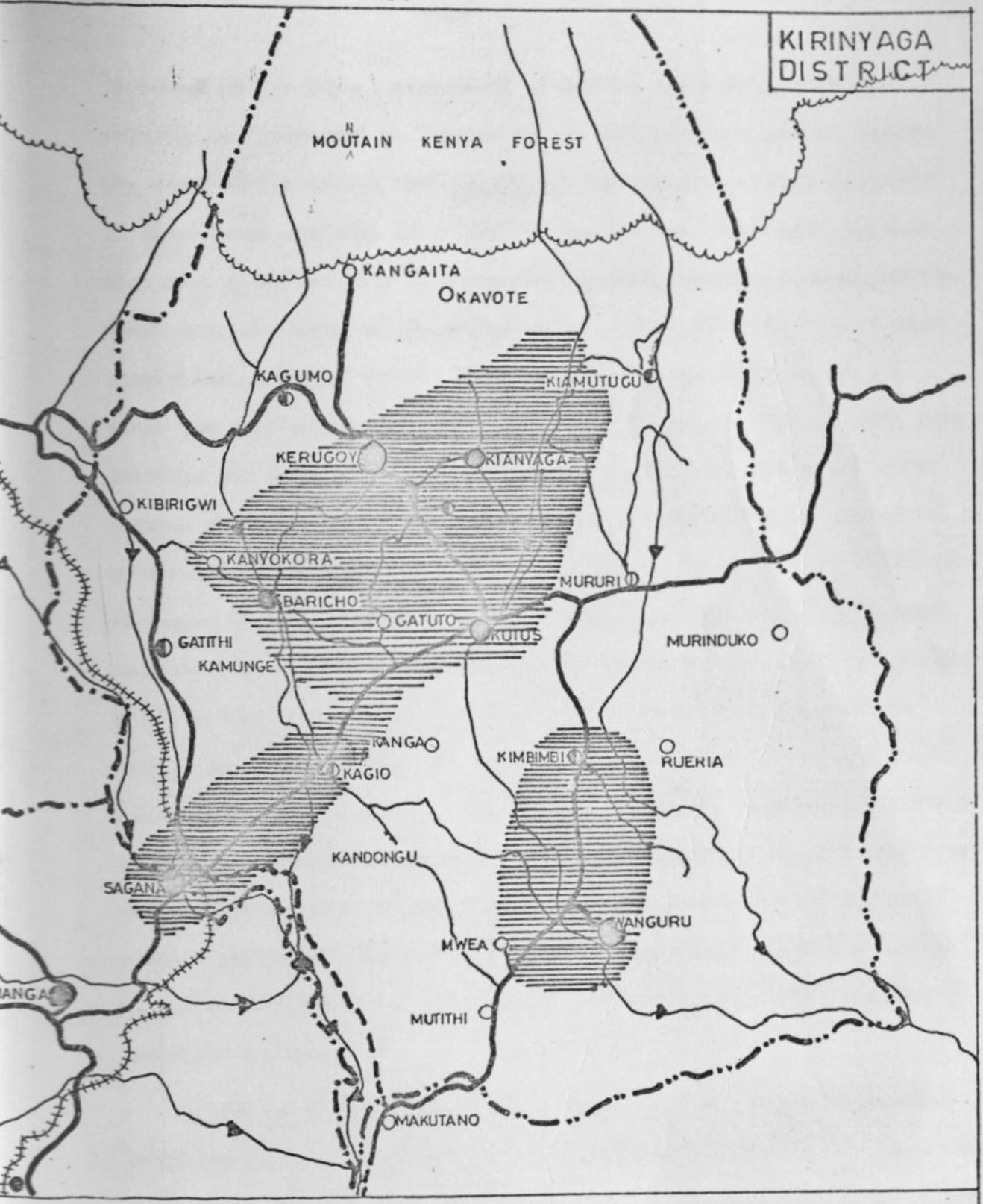
3:1:3. INFRASTRUCTURAL NETWORKS:

The schedule of infrastructural dispersal is given in terms of areas where these, and services, are unavailable and threshold costs would delimit their provision (10). This reduces the industrial belt to two areas - a northern zone covering Kanyokora, Baricho, Kerugoya and Kiamutugu, and a southern zone running from Makutano to Kimbimbi. Sagana which seems to form a separate zone may be regarded as a third location.

According to the level of settlement population in these zones, the northern zone is more appropriately suitable for processing local consumption goods. The southern zone and Sagana area are suitable for processes geared towards markets outside the district. These areas obviously overlap especially at Kagio and Kutus.

3:2:1: LOCATIONAL FACTORS:

The interests of industrial location have not been specified in the



G. 16: ZONES OF INFRASTRUCTURAL CONCENTRATION
(note relationship to settlement pattern)

- Local centres
- Market centres
- Rural centres
- Urban centres

Areas of infrastructural concentration
(at least three of water, sewerage, electricity, postal & telephone, and all weather access)

Scale 1: 250 000
km
0 5 10
N

national policy beyond statements of general application such as emphasis on "backward" or "neglected" or "undeveloped" areas. Perhaps the overwhelming notion that nearly all the country could be described in those terms explains this lack of specificity. Strategies on location have given priority to areas like Mombasa, Kisumu Kakamega, Nakuru Nyeri etc. In terms of industrialisation, these areas deserve as much consideration as any other. This confirms that in these terms, all areas are considered under-developed. It does not explain however, what criteria are to be used in phasing out the industrialisation programme between area and area, and in determining what should be the manner of differentiation between the type of programme emphasis, and the characteristics of an area. Looking at the national policy on rural industrialisation, one is left with a feeling that government or parastatal assistance has been prescribed to this sector in a way to agricultural extension services. Unlike the latter, the industrial extension service has a large measure of novel aspects e.g. marketing competition product improvement and management, and the economic requirements on location of the activities to be served. Consequently industrial policy for rural areas, especially small scale industry, would not be conclusive without inclusion of location of the activities as part of the policy implementation strategy.

As one of the ultimate determinants of success of small industry in Kirinyaga, availability of appropriately trained manpower is important. Chapter 1:3 clearly shows that the prevailing manpower conditions in the district are not conducive to fast and innovative industrialisation process. It is for this reason also that it has not been possible to identify any significant pockets of skill concentration that could influence locational decisions. Labour mobility within the district, and between the district and the surrounding districts is further explanation of lack of significant concentrations of specialist manpower. Although intra-

district location decisions may not be influenced by availability of manpower, long term decisions to 'industrialise Kirinyaga will be affected, It may be noticed from chapter 1:3 also that the areas with possible concentrations of manpower ultimately would be the rough triangle between Baricho, Kianyaga and Kutus - and two out-positions at Sagana and Wanguru. These areas relate to the concentrations of settlemets and population at the present moment, besides being the areas of relatively higher land carrying capacity.

National policy on provision of technical skills emphasises training in all manner possible - self - help, 'haram bee' institution and several government agencies e.g. department of social services, Ministry of Labour, and national technical schools. Again, due to the extent of the problem, no specific demand requirements have been indicated. It seems as though any institution or agency that could train any number and in any skills is welcome to do so.

Not even at the district level has it been estimated what the likely demand of the technical manpower is nor the manner of their training in the short or longer term. Although instutition, rather than empirically derived decisions, is an important decision making tool in circumstances of overwhelming widespread problems, and unavailability of necessary data, it is equally important to assess the situation once a line of action e.g.Rural industrialisation, has been taken. The manner of obtaining appropriate manpower needs for the activities recommended is proposed under section 3:6:2.

In identifying location determinants, availability of resources especially raw materials was noted as a factor common to small industries. Two explanations are given for this co-relation. Firstly, industrial processing in certain cases achieves definite advantages by locating near the source of materials. Such advantages could be

economic such as in the case of saw mills, rice mills and cotton ginnery, or time saving as in the case of Kangaita tea factory coffee factories and flour mills. These advantages interest larger scale activities with strong bias for external markets. Secondly, in some other cases, industrial processing has a srong attachment to rural agricultural economies, especially due to the fact that individual entrepreneurs are also local farmers and the industrial investment is more to supplement the family income rather than the only source of it. This reduces the intra-district mobility of investors in accordance with other locational advantages and gives rural industry a unique characteristic - that in terms of processing and ownership, it is not detachable from agricultural activities and materials. Not until industry reaches where it is capable of fully sustaining the proprietor and his family, could the proprietor detach the industry from its supplementary relationship with agriculture and devote all his time to its improvement. This process is closely related to the approach suggested in this study i.e. gradually developing industrial activities through phases of small activities in any site locations to larger activities in specialised site locations in industrial estates and in dustrial areas. This recognises a system of formalised industrial groups, industrial areas and industrial estates all emanating from varied combinations of small individual firms and contrasted from isolated activities in normal comercial areas - e.g. cobblerly or capentery.

A parallel location system for industrial activities has been identified, which relates the level and type of activity to the level and type of threshold population. This indirectly relates the industrial activity to the hierachy of centres. Hence larger scale, modern and 'external - market' oriented activities could locate at any point in the district, the only limitations being infrastructure, availability of materials etc.

Thier agglomerative forces create a favourable environment in the places they locate in e.g. Wanguru and Kangaita. This fact should be fully considered while deciding on the location of this type of activity. Medium scale internally oriented activities tend to be attracted to existing centres, but with sufficient patronage for their success. Consequently they are frequently found in centres below the rural centre level. Finally there are the small scale and crafts activities which seem to closely relate to the smaller type of centre but are found in all levels of centres in varying numbers. They are rarely primary processes and are often re-use activities. They depend on left-overs of other activities for raw materials and utilise simple tools and methods. One common feature of this "system" is that it renders itself easy to classify again into units, clusters formal industrial areas and estates- in the manner of an activity which grows through the "system". The various "levels of industrial activities treated above are similarly differentiated by their infranstractural needs. The analysis under chapter 2:5 showed that various types of activities have shown different levels of response to various types of infrastructure in their choice of locations. The more sophisticated an activity is, in terms of manpower demands, processing systems and product distribution, the greater its demand of a greater variety and quality of infrastructure. Thus the modern forms of infrastructure e.g. electricity telephone, sewerage, postal services, tarmac reads, etc partly determine the locations of larger scale and "wider-markets" oriented activities. Lesser scale activities are less responsive to these forms of infrastructure, and more to market and space forces. This also relates to the variations in levels of infrastructural concentration in

various levels of service centres. In the district studied, three urban centres and one rural centre (Kutus) have been identified as having the infrasturctural capabilities for larger scale externally oriented industrial activities. Two rural centres (Baricho and Kianyaga) and four market centres (Mwea, Kimbimbi, Kagio and Mururi) enjoy similar infrastructural levels. Consequently, avaialble infrastr infrastructure coupled with the existing settlement pattern has been used to determine the manner in which industrial activities may be distributed and space allocated for these. The amount and distribution of the land required has been dealt with under chapter 3:7 below.

3:3:0 INDUSTRIAL RESOURCE INPUTS

In furtherance of rural industrial development through new avenues, a careful assessment of the combination of the additional resources required is critical to the success of such development. The number of resources needed may be grouped in four categories. These categories can also be deduced from 1:0 and 2:0 of this study.

3:3:1. MANPOWER RESOURCES:

This implies formation of necessary skills for the range of activities among the enterprises. To be viable, this formation would require a technically based education. It should also follow assessed requirements. This has been dealt with under section 1:3:3.

3:2:2: FINANCIAL RESOURCES:

These are expected to cover both industrial assistance

and administrative and technical expenses of the programme. It is noted that available resources of this category are enough for initial onslaught. It is theaallocation criteria that requires re-examination.

3:3:3: RAW MATERIALS:

Industrial inputs are an absolute necessity. Availability of these and existing marketing possibilities have been examined under section 2:0. Processes through which they are transformed into goods and services require updating in some instances. In others, they require introduction of purely new technology (see section 2:0). The quality of the final product is also a reflection of the level of technology employed in processing in general terms. The quantity is much more a reflection of availability of raw materials, demand of the final product and the rate of production. Since in many case, market demand is almost guarantee production limitations remain the level of technology and availability of raw materials.

3:3:4. SPACE RESOURCES:

Space in this context provides the medium of interaction between manpower, finances, raw materials and technology. Space requirement is closely related to industrial potential and it is a pre-requisite to any industrial investment. Quality of industrial space in terms of its location, services and product demand potential in an area determines the potential for industrial growth in an area. The quantity should be measured against the assessed potential of a centre as reflected in the potential demand for manufactured goods.

An important feature, common to all these resources, is their measurability. Their qualities are difficult to assess. Resources 3:3:1 to 3:3:3 have therefore been discussed mainly in terms of the quantities required.

3:4 CONCLUSIONS

3:4:0 GENERAL CONSLUSION:

3:4:1 The rural industrial pattern revealed in Kirinyaga District and the settlement pattern show an inseparable relationship that indicates that the process of rural industrialisation is itself an indirect approach to urbanisation. The level of urbanisation reflects the level of activity and vice verza. Therefore, the programme of rural industrialisation could be utilised to monitor desired settlement pattern. If this is to be done, then deliberate selection of certain activities and their locations should be an important strategy. The level of activity should be one that benefits the settlement by providing goods and services, as well as employment, and where possible, utilisation of local raw materials. Produce marketing and employment opportunities should benefit the area of location. To do this, a further choice has to be made between activities which demand extra infrastructure and those which do not and consequently a choice of location where this infrastructure is easily available and where it can be provided only at a cost.

3:4:2 The rural industrialisation programme could also be directed at enhancing the services level of the existing centres. This has been noted in connection with the tendency of certain goods and services to locate at certain levels of existing centres which happen to provide the patronage level required for their existence. This strategy would require careful selection of, not only the centres to receive the activities, but also what type of activities should be located at which level of centres. It was found that medium and larger scale enterprises should only be encouraged in rural and urban centres, while other smaller enterprises could be located in even smaller centres.

3:4:3 It is noted that decentralisation of industrial activities would mean injection of concentrative influences at the new rural locations and does result in new urbanisation trends. Consequently urbanisation policy and rural industrialisation policy are functionally related and can be utilised for their mutual complementarity to enhance the success of both. Considering centres for their social services only does not ensure their economic viability and similarly locating industry in an area is no guarantee of economic patronage or conversely, service benefit to those around. Consequently selection of the centre and the site should form part of the rural industrialisation process, which on the physical side requires allocation of space and infrastructural resources Kutus, Kagumo and Kagio exhibit this characteristic advantage.

3:4:4 Finding that rural industry does have concentrative influence at its location, it would be important to consider centres at which important industry locates, particularly due to local advantages, as possible service centres. The influence of the rural industry results in aggromeration effects which could be harnessed to form the embryonic basis for more industrial activities. This nature of centre need not have corresponding levels of administrative services, and may suffer less growth for this, but then it would be a centre which could grow out of economic rather than service advantage. In Kirinyaga District, this has already happened at Wanguru. Kangaita, a late comer among rural industrial locations, may end up in the same way . This would alleviate the adverse effects of frozen capital through location of addtional activities there. It is notable that Kangaita has acquired characteristics which now demand recognition.

3:5:0: OPTIONS AVAILABLE

3:5:1 POLICY OPTIONS:

The fundamental elements of the background economic system on which rural industrial programme is based are framed on a centralised model of resources allocation and physical structure. The dominant economic activities are centralised in organisation and their competetive capacity large. Basically they favour a primate settlement pattern and they counter efforts to set up replicas of their activities in rural areas. Consequently decentralisation of already existing activities would be seriously hindered by the economic system inherited from a past economy. The alternative therefore falls on activities which have hitherto no large scale developed counter parts. Save in exceptional cases, decentralisation should therefore be geared towards decentralisation of efforts and resources rather than activities, closely aligning itself to the growth and service centres policy. The growth points are related to areal resource potential and so indirectly to a major locational requirement of industrial location. There should be a shift of emphasis from administrative services to agricultural and industrial potential as the chief criteria for centres location. Service diversity should be a further factor which would ensure increased growth.

The nature of the firm, particularly in regard to its capability to expand, should be related to the hierachy of centres. Firms which may expand to become dominant tend to distort the settlement pattern. Their location should be such that their expansion will find supplementary support from the level of centre they are located in. This way, both firm size and its expansion potential may be used as policy instruments in the selection of location.

Interaction of various efforts made towards the programme, particularly postive action by state agencies, and the obstacles found should be more closely investigated. Policy strategy on removal of constraints should be directed to those factors which would produce greater effect on the bottlenecks. The effectiveness of privately saved finances as opposed to government loans should be noted. Greater emphasis should be placed on eliminating constraints which reduce the popularity of the intermediate sector, e.g. non availability of space, inaccessibility of licences and admissibility of non-formal industrial premises. Legal restrictions e.g. standardisation of premises and health requirements, which are of little environmental consequence, should be altered. The existing programme approaches, have little effect on these aspects. It should therefore form an added parameter to the attempts to improve the conditions of the intermediate sector. It is noted that investment drive and interest in this sector are not serious limitations to the growth of rural industry. Ignorance of available opportunities however seems to be an important factor. Opportunity scarcity tends to increase this ignorance and the present methods of making available opportunity well understood are not really effective.

Existing firms face less problems as they are already beneficiaries of the positive parameters either public or private. Among parameters which affect them negatively are lack of access and legal restrictions, besides need for power and water, popularity of other investments and general ignorance. Some limitations may be alleviated by use of existing policy instruments. Legal impediments and popularisation of this sector against other sectors are not covered by existing tools and new tools would need to be developed.

From the analysis in Chapter I:1 it is clear that the policy

coverage is not sufficiently comprehensive. Certain essential aspects are uncovered and their nature is given above.

The success story of the industrial Estates in operation confirms the potnetial for new and re-organised enterprise that was latent in the growth poles. While the time has not come for shifting emphasis from the larger centres to semi-rural and rural villages, it should be realised that crafts and artisan trades by the nature of their size and activity are more prone to market competition from larger on-going firms from urban areas. Although they require more than normal effort to make them a success, they do not suffer the difficulties of acclimatising to rural conditions as do the larger firms. All entrepreneurs of artisan and crafts firms interviewed did not express any complaint about lack of housing or shopping facilities, which, it is assumed, would be limiting factors to more sophisticated urban entrepreneurs and skilled workers of larger factories. The argument tendered here is that crafts and artisan trades demand less infrastructural and support facilities like shops, schools, hospitals, cinemas, theatres etc. than do larger firms. Consequently they are more enduring to rural conditions, are more foot-loose and capable of adaptation to small settlements. While the policy of industrialising rural areas stands they remain the most effective means of doing so. On the whole, their multiplier effects, particularly in the area of training more craftsmen supplement the efforts of Rural Industrial Development Centres. They are therefore capable of alleviating their skill problems much sooner than do larger enterprises. A policy strategy of making them skilled workmen and ultimately confident entrepreneurs should be emphasised.

Project selection should be more seriously considered, particularly taking settlement implications into account. Kirinyaga district has a

tradition of utilising the plough using the cow as a draught animal and the donkey for pulling "ox-carts". Although these may go out of market in favour of the tractor and motor transport, farm sizes will not permit instant mechanisation. Where road access is not particularly good, the ox-cart is expected to stand. The plough is important in the upper middle zone and upper zone and manufacture and repair of this implement is important for this area. These activities are definitely related to the level of technology and while this lasts, they are an important oplion. Their organisation could easily be transformed for tractor plough repairs and general repairs if this should ever become necessary. In Kagio, an entrepreneur repairs both tractors and ploughs.

3:5:2 LOCATION OPTIONS:

Options identified above in spatial perspective in the district are "superimposed" onto a pattern of potential areas revealed by existing infrastructure and activities (See Fig. 16). There are two belts of potential locations stretching North-South and East-West, crossing at Kutus. This is further confirmed by field observations of the author on the trend of origins and destinations of transport media. Settlements also relate to this pattern with Kerugoya in the North and Wanguru in the South, and Kutus in the East and Sagana in the West. The pattern also closely relates to the 'infrastructural' zones identified under Section 3:6:1 above. To conclude the dominance of these centres, on the nature of existing situations had been taken into account. On the whole, Kutus has an overriding advantage among its counterparts, Kianyaga and Baricho. Kutus could form an appropriate policy focus for the local authority in matters of industrial location. Physical plans for this centre should therefore consider its industrial location potential by providing relatively more industrial space than would normally be allowed in rural centres.

have not been as closely related to the needs of rural industrialisation as the others. Provision of industrial land has often been done on the basis of requirements of each centre, quite apart from the considerations of regional land requirement for industry and the variety thereof related to the nature of industrial activities anticipated. In fact in some eases, industrial land has been provided rather as a contingency for a possible rather than assessed need. This is borne out by the amounts of land provided for the purpose in for instance Baricho as compared to Kutus, or Wanguru, Sagana or Kerugoya. The differentiation in amounts does not seem to conform to the potentital for the types of industry that may locate in these areas.

A more serious drawback in the provision of land for industry is the tendency to regard such space as a benefit to the entrepreneur only- and not iniits regional importance. It is very rarely considered to be a complementary input to the industrialisation programme along with financial, managerial, infrastructure etc. assistance given. The prevalence of 'industrial' activities in officially unrecognised locations reflects unsatisfied demand for formalised industrial areas. Due to their informal nature and the consequences of official indifference, such activities are further penalised through different license schedules and threats from health authorities besides the demoralisation from the poor working environment. Consideration of the recommended settlement pattern and the identified industrial location potential has led to the o nclusion that altitude towards industrial space should be re-examined and re-oriented to be part of the efforts to create further opportunities for industrial growth.

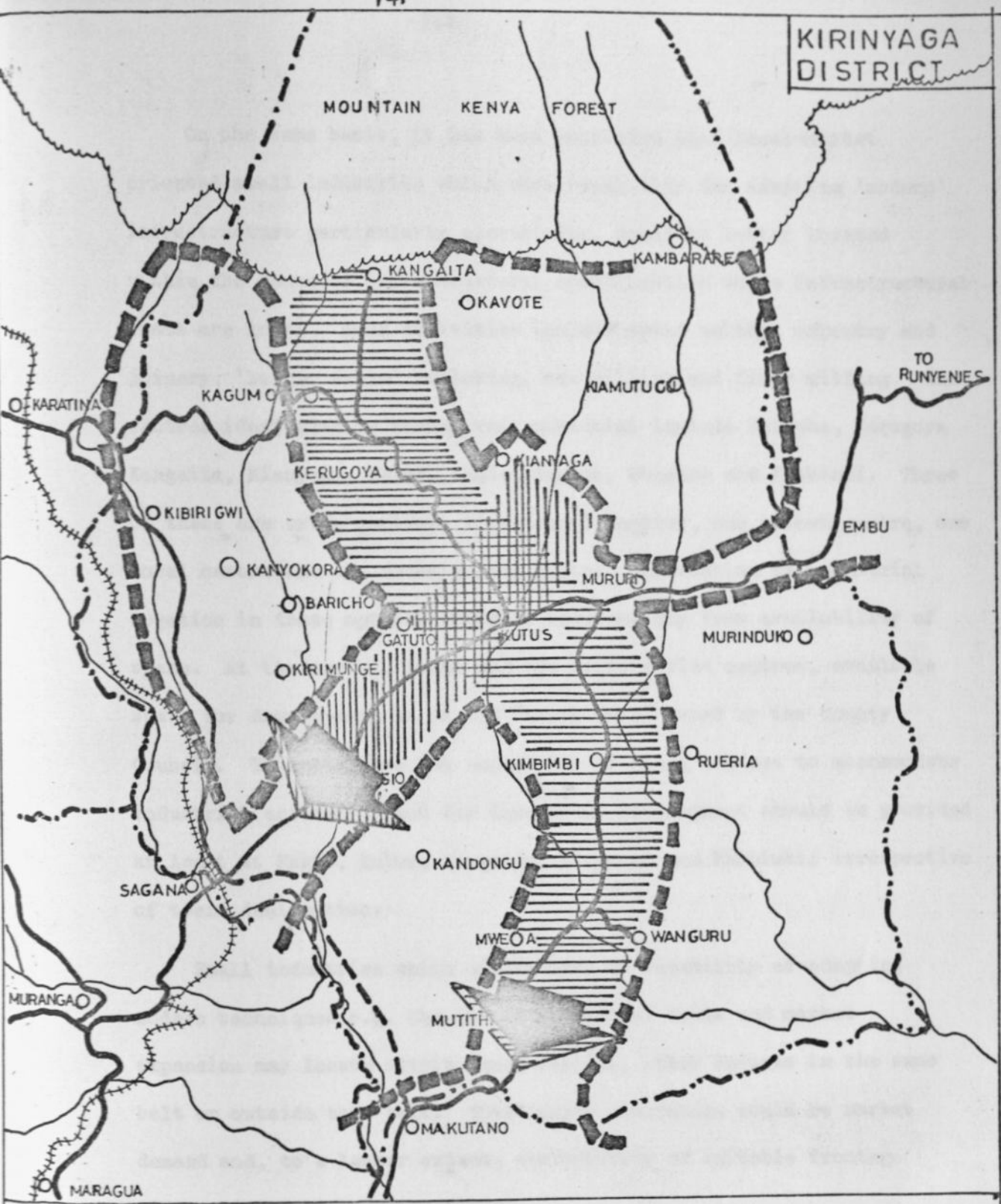


FIG. 17: SUGGESTED INDUSTRIAL ZONES BY ACTIVITY LEVEL

On the same basis, it has been concluded that local-market oriented small industries which have capability for adapting 'modern' infrastructure particularly electricity, would be better located within the zones of infrastructural concentration where infrastructural costs are lower. Such activities include metal smithy, capentry and joinery, 'larger scale' tailoring, saw milling and flour milling. The centres identified as having this potential include Baricho, Kerugoya Kangaita, Kianyaga, Kutus, Kagio, Sagana, Wanguru and Kimbimbi. Three of these are urban centres, three rural centres, one market centre, one local centre and one undesignated centre. Limitation to industrial location in these options would be found mainly from availability of space. At the market, local and the uncla-sified centres, available space for development in is the "trust land" owned by the county Council. To anticipate the capability of these centres to accommodate industrial activity, land for industrial development should be provided at least at Kagio, Kutus, Kangaita, Kianyaga and Kimbimbi; irrespective of their designation.

Small industries which either have no capability of adapting modern techniques e.g. the use of electrical tools and market expansion may locate within these centres, other centres in the same belt or outside this belt. Their major limitation would be market demand and, to a lesser extent, availability of suitable frontage sites which would enhance sales.

Taking about double the normal commercial plot to be gross land requirement for a small industrial enterprise, the nine centres mentioned above would require about nine hectares between them, accommodating about ninety enterprises. On the basis of estimated patronage for all urban centres, this represents about 25% of all

enterprises which may be able to earn an average of 1000/= per month. These ninety activities would be located in the centres identified above with greater emphasis on Kutus/Kagio area, Kerugoya, Kagumo, Sagana and Wanguru. Lesser emphasis should be put on Kangaita, Baricho Kianyaga and Kimbimbi which have, relatively, marginal advantage. Consequently, space (about 10 ha.) should be set aside in this belt to facilitate location decisions.

3:6:1. PROGRAMME

RECOMMENDATIONS AND PRIORITIES

From the foregoing, it has been possible to formulate recommendations on roughly three asepcts.

(a) Measures to improve the opportunities for investment in small industries.

(b) Measures to effect greater co-ordination in location of enterprises.

(c) Possible locations of specific enterprises noted as having a certain level of viability in the district.

3:6:2. OPPORTUNITY CREATION :

An important limitation identified in opening up of new enterprises has been related to the requirements of policy in licensing, industrial premises standards, methods of making land available for the purpose and manpower availability.

It is suggested that licensing of enterprises be more indiscriminate in the sense that small enterprises housed in sub-standard premises be licenced on the basis of production and not on a flat rate per year. This flat rate tends to penalise enterprises in their formative years, as against conventionally housed enterprises which tend to pay less per unit of output. Sub-standard premises should be accepted as an integral part of the industrialisation process. This calls for a relaxation of health requirements for industrial premises where small industries are accommodated. As activities become larger and use heavier equipment, more strict premises standards may be enforced along with location in industrial areas.

Non-availability of land is also a hindrance, particulary because

development space is often viewed as benefiting the investor individually. It is suggested that land for industrial development be made available more with a view to benefiting the region and the community, so that development of the area becomes the motivating influence. This need not conflict with the allocation methods in force. Any enterprise proving to be feasible should be encouraged to locate in the area suggested in section 3:6:3, within the 10 hectares proposed.

To realise a corresponding supporting manpower, the education system should be geared towards technical skills acquisition. At least 40 at standard seven, 20 at For Two, and 20 at Form Four, from the District should be filtered into formalised technical training so as to cope with demands for productive activities that may arise. It is realised that there is a time lag while this is being effected, but then there is equally a time lag in making space and finance available to enable 'entrepreneurs' to take interest in industrial investment.

3:6:3. CO-ORDINATION OF ACTIVITIES LOCATION:

Physical Plans for the designated centres often show a certain space for industry and another for other uses. The R.I.D.C. is continuously selecting activities for assistance while the land allocating agency, (plot allocation committee or the country council), is allocating space without regard for those assisted. But none of these activities are necessarily co-ordinated. It is suggested that measures should be taken to encourage liason ebetween all these decisions. Specifically, the agency charged with promotion of rural industrial activities should be made fully aware of availability of industrial space in various centres, and the planning views about which industries could be located in which areas. If possible, this agency should be co-opted to the plot allocation committee especially when industrial and commercial plots are to be allocated.

Besides, if an enterprises is to be assisted, or an industrial entrepreneur is to be allocated space, or industrial space is to be planned, all the three involved agencies must be informed and the level and nature of the activity or space so dealt with indicated. This will help in ensuring that all three bodies agree on the suitability of the selected location and on the non-availability of a better alternative.

On a more general note, a test criteria such as the one below may be used for site selection.

ACTIVITY LEVEL	OPERATIVES	REGIONAL LOCATION	SITE LOCATION	INFRASTRUCTURE
Crafts and Trades	1 -5	All Centres	Shopping Frontage	Possible Roads Water
Small and Medium Scale	5 - 50	Rural Centres and larger	Shopping "Industrial Area"	All Weather Road Electricity Sewerage
Medium and large scale	50+	Mainly urban Centres and above	Industrial Estate Industrial Area Isolated Locations.	All weather road Electricty Postal and Telephone Water Sewerage Social Services

Table 25: Locational components and their relation to hierachy of centres.

Source: Own survey.

It is realised hat this chart has been generalised, but it serves to illustrate how siting, location, infrastructure may be related to settlements and space allowance. It is this criteria, related to the infrastructural and settlement pattern analysis, which has been followed to arrive at centre locations of the potential activities below.

3:6 :3 LOCATION OF SPECIFIC PROJECTS.

In the course of analysis, it was noted that three basic enterprises show potential in the district. These are:

1 Flour Milling: This is chiefly a relocation and modernisation possibility. Those that exist are at locations removed from the mainstream of distributive network (except at Kutus) and often utilise water power. This is an activity easily adaptable to electric power at no great cost. According to the location criteria above, it is recommended that improved enterprises of this nature should be located in three alternative centres - Baricho, Kianyaga or Kagio.

2. Animal Feed: This activity is ocomparatively sophisticated and demands relatively more sophisticated infrastructure and an efficient distributive machinery. Its raw materials are available in the district and that the possible product ingredients are found either at Sagana (grain gathering centre) or Wanguru (cotton seed at ginnery). These centres are within the necessary infrastructural range. The two are recommended for its location. A third alternative location is Kutus, with Kagio and Kerugoya almost equally favourable.

3. Mattress Making: This enterprise would rely heavily on the cotton waste from Wanguru ginnery, but this being a light weight raw material, the enterprise may locate at other areas where the complementary cloth material may be easily obtained. This latter is more likely to originate from the direction of Nairobi, and with the possible improvement of Thika-Sagana road, Wanguru remains the most favourable location.

Kutus and Sagana are other alternatives.

3:6:4. PHASING.

This last set of recommendations constiute what may be regarded as Phase Two of the industrialisation efforts. The first Phase involves assessment of re-location possibiities of existing small activities together with selecting them for land allocation and giving them formalised assistance. Phase Three should involve further investigation on possible projects and the effecting of the technical training programme with long term objectives.

3:6:5. THE FUTURE PERSPECTIVE.

It is realised that the greatest drawback to the industrialisation programme is the sheer magnitude of the task of individually assisting all entrepreneurs and potential entrepreneurs who may be hundreds of thousands in the country. Knowledge of the most common complaints from them and experience of their response to assistance has shown that the nature of assistance required is not in heavy machinery or sophisticated techniques. It is in easy-to-absorb ideas, simple machinery, tangible assistance in the form of finance, and secure working environment. Of these, a formalised and officially recognised safe working place is an important pre-requisite.

These needs simplify the alternative approach to assistance in that:

(a) The whole programme may be extended to cover more people by utilising less of individualised assistance in the field- adapting more of centralised assistance at a formalised industrial "cluster." This way more will be reached at lower cost. Less assistance staff will also be required for the same number as before.

(b) Assistance in other forms can now be stepped in a similar manner to assistance in acquiring premises, with only serviced plots

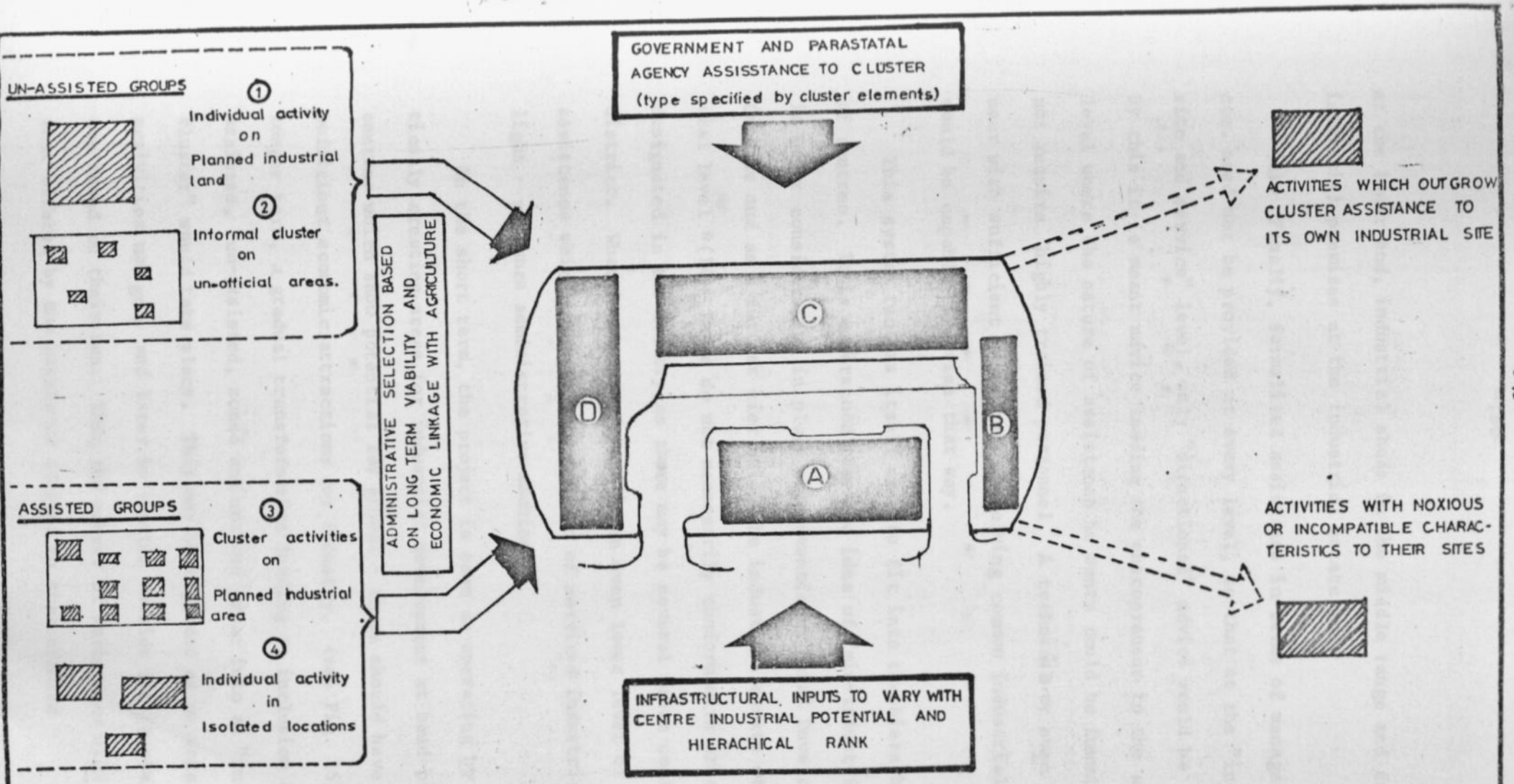


FIG. 18: SCHEMATIC STRUTURE AND ELEMENTS OF PROPOSED ACTIVITY CLUSTER

Ⓐ Display, Administration, and Common machine block.

at the lower end, industrial sheds in the middle range and full fledged industrial premises at the industrial estate end.

(c) Finally, formalised assistance in terms of managerial advice etc. need not be provided at every level, so that at the "industrial site and service" level, only "directional" advice would be available. By this it is meant advice leading the entrepreneur to the administrative level where the nature of assistance he wants could be found. This does not require highly trained personnel. A technician or even an entrepreneur with sufficient experience in solving common industrial problems would be capable to advise that way.

This system renders itself easy to fit into the hierachical system of centres. It is understood that the idea of "min-industrial estates" is under consideration in place of conventional Rural Development Centres and as a further tier below the industrial estate at the provincial level *(14). These do not necessarily conform with urban centres designated in the country as there may be several urban centres in a district. What is suggested here is an even lower level of industrial assistance which may involve provision of serviced industrial space and light - guidance administrative machinery.

In the short term, the project is seen as operating by systematically creating areas for industrial development at hand picked centres which show potential for growth - these should have functions and sufficient economic attractions for industry. (see Fig. 16). In the longer term, a gradual transformation leading to inclusion of presently assisted, un-assisted, zoned and unzoned areas into an "industrial cluster" would take place. This may be regarded as an area where small activities may grow and later be located outside the cluster once they can stand on their own. Then the manner of assistance will change from that offered by the estate or cluster to that offered

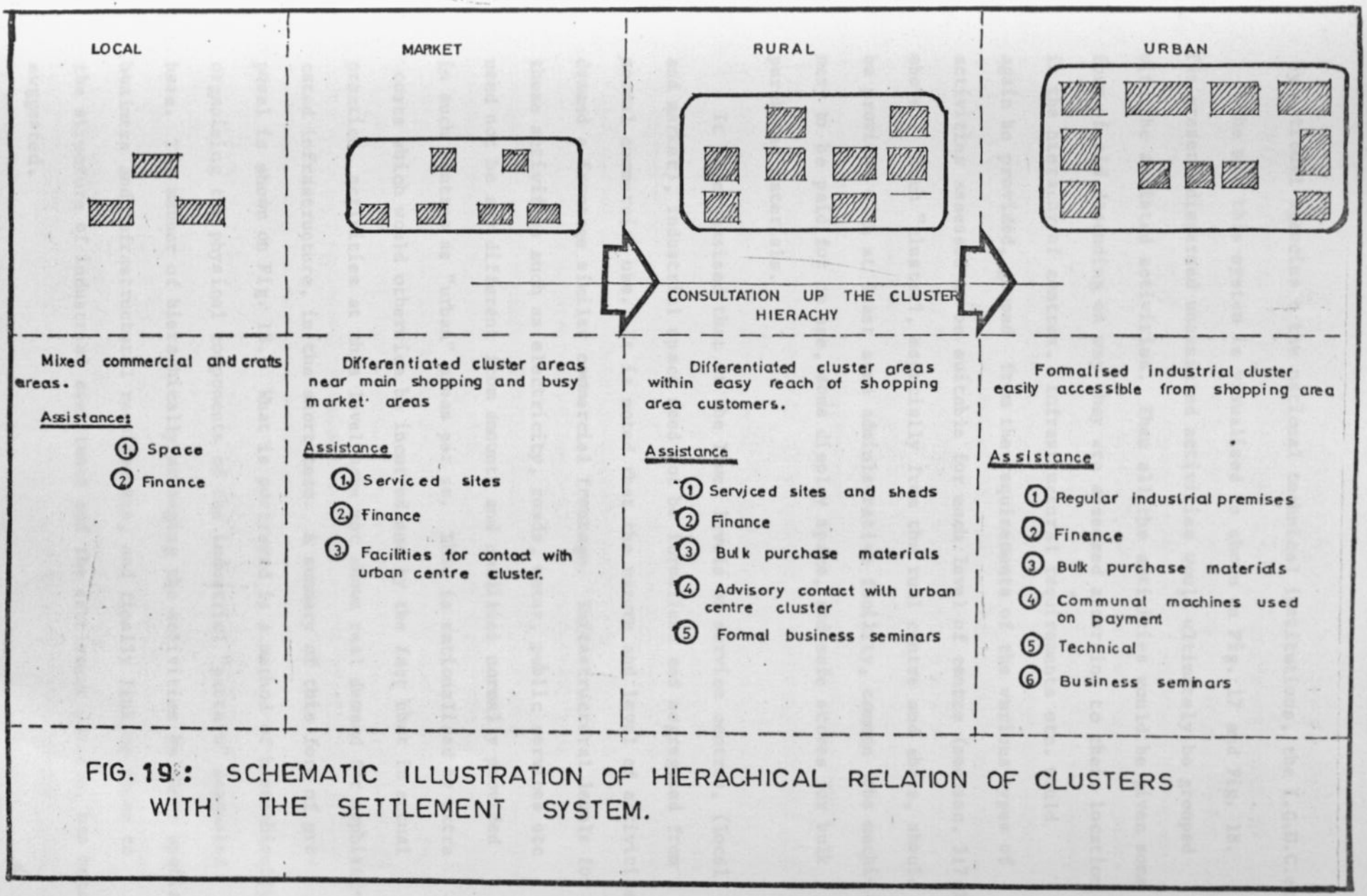


FIG. 19: SCHEMATIC ILLUSTRATION OF HIERACHICAL RELATION OF CLUSTERS WITH THE SETTLEMENT SYSTEM.

by national agencies - the national technical institutions, the I.C.D.C.etc.

The way this system is visualised is shown on Fig. 17 and Fig. 18. The present dispersed unassisted activities would ultimately be grouped with the assisted activities. Then all the activities would be given some form of aid depending on way they are assessed according to their location in the hierachy of centres. Infrastructural requirements etc. would again be provided, gouped from the requirements of the various types of activities assessed to be suitable for each level of centre (see sec. 3:7:1:2 above). Each "cluster?, especially from the rual centre and above, should be provided with at least some administrative facility, common jobs machinery to be paid for on use, some display space, and safe stores for bulk purchased materials.

It is emphasised that at the lower levels of service centres, (local and market), industrial space need not be formalised and segregated from normal commercial use. It is noted that the nature and level of activities demand a frontage similar commercial frontage. Infrastructural levels for these activities such as electricity, roads, water, public services etc need not be any different from amounts and qualities normally provided in such centres as "urban" areas per se. This is rationalised by extra costs which would otherwise be incurred and by the fact that in actual practice, activities at this level have not shown real demand for sophisticated infrastructure, in the short term. A summary of this form of proposal is shown on Fig. 18. What is portrayed is a method of hierachically organising the physical components of the industrial "pattern" suggested here. The manner of hierachically arranging the activities by their spatial, business and infrastructural requirements, and finally linking these to the structure of industrial assistance and the settlement pattern, has been suggested.

3:6:7: SOME APPROACHES TO CO-ORDINATION.

This study has attempted to look at the programme of rural industrialisation and the service centres programme as two parts of a whole. The structures implementing both programmes have been found to be capable of adaptation to the new approach which demands closer liason. A third agency, the County Council, has been included so as to guarantee availability of industrial space. This team of three agencies is expected to work in close collaboration with the district development committee in ensuring the availability of infrastructure and services at the settlements which have potential for industrial investment.

The Physical Planning Department would identify centres with industrial potential alongside its programme for service centres. The local authority would ensure that required space is available at the identified centres. The R.I.D.P. would then organise assistance to be directed at such centres. Finally the District Development committee would direct infrastructural development efforts at such centres. It is expected that all these activities would be carried out in a rated manner so as to conform with the hierachical level of each centre. The method advocated here begins with the planning unit - the district, then larger units. At this level, sectoral agencies should collaborate more in matters of rural development. The notion that an investment is sectoral affair and benefits the entrepreneur should be replaced with a consciousness for regional development.

This will enable Kirinyaga to benefit more from ancillary activities in Thika and Nairobi.

1. Arising investment opportunites will attract resources from these areas. More entrepreneurs, investment finances and technical skills will be induced into the district. The prevalence of privately saved finances and skilled manpower originally from urban areas support

this view.

2. Products which are at present 'imported' from Nairobi and Thika have oriented the community in Kirinyiga, particularly those along the most accessible corridors, towards consumption of 'manufactured' goods The use of metal and wood products, clothing, shoes etc. has created a demand for such products. Local production is gradually replacing, this 'importation'.

3. At present, trade relations with urban areas are weak. The district has been sending most of its primary products in a semi-processed form. It would be possible for the district to reap great trade benefits by processing maize, and plywood timber which find a wide market in urban areas.

4. Finally in formed contact of residents of the district with urban areas has increased entrepreneural interest. The range of investment and the type of product are often replications of those in urban areas. This way, urban technology has flowed to rural areas.

It remains now to indicate the agencies which should undertake the suggestions made in this study. This should serve to establish if the candidate industries are viable within the district, or if they should be set up in collaboration with other areas. This is set out in the chart below.

Potential Industry	Study	Agency
Tea Chests & Packing Timber	1. Investigations into suitability of Mt. Kenya Logs. 2. Possibility of planting suitable log. 3. Viability of packing industry.	Forestry Department Provincial Level. I.C.D.C.
Animal Feed Production	1. Availability of ingredients Locally. 2. Animal feed market	I.C.D.C. and Veterinary Department District Level
Mattress Making	1. Availability of Local Materials 2. Local skills.	I.C.D.C.
Utilisation of Coffee	1. Distribution of material in the district and amount 2. Demand for the type of manure	District Development Committee Dept. of Agriculture Coffee Union (District Lvel

Table. 26: Agencies to implement recommendations;

It is not supposed that the system of linking the settlement with the Industrial policies at the local level has been comprehensively covered in this study, neither is the subject exhausted. The treatment has been heavily biased in favour of physical forms. The argument is based on spatial expression of industrialisation in a rural environment. There is, therefore, a large scope for further work on the same and related subjects through changing the exphasis. Some of these are summarised below.

3:6:8: SCOPE FOR FURTHER RESEARCH.

It is noted that, finding a common basis for maximising the benefits of the complementary industrial and settlement policy, is only a part of a greater fabric of interacting elements which bring about development of rural areas. There are however, problems which are peculiar to each complementary part.

3:6:8:1. It would be necessary to find out to what extent investment outlets compete for the meagre finances and entrepreneural capability of investors. It is possible there is some truth in the allegations often heard that entrepreneurs are spreading themselves thin. This has sometimes been confused with diversification, and thought to be a good thing. This field is an interesting one to study. It might be that some channels are unpopular investement outlets. If this is so, then programmes to encourage such ingestments would ahave to include publicity. Industrialisation may be such a victim. Facts suggest that this may not be so. The existence of such activities before assistance was available would suggest the acceptability of this mode of investment. However, the existence of other supplementary businesses, especially run by the same entrepreneurs alongside industrial investment indicates some uncertainity of the investors and a possible cause of slow expansion. It would seem necessary to find out to what extent this "divided loyalty"

between investmentss ay hinder efforts to industrialise rural areas. Profits etc. may be getting diverted to other investments, consequently the activities may not expand as fast as may be expected. The e effect this may have on the settlement pattern and economic diversity of the rural areas would be different from that likely to arise from a thriving and continuasly expanding rural industrial activities.

3:6:8:2 A more detailed look at potential rural industrial activities alongside assistance to existing activities is important and calls for research in-to rural activity relationships so as to throw more light on the manner of activity patterns that may easily thrive in rural areas. Rural activity interdependence is one area about which little is known. There has been a tendency to treat rural industrial development on a unitary basis. consequently, activity repurcussions on general ruralllife is often taken for granted. To what extent, for example, does the setting up of an industrial cluster' in an area affect agricultural activities, manpower availability, investment in other activities etc? Ab ng with this, it is necessary to find out other means of alleviating opportunity impendiments created by lack of understanding of the working of rural industrial development as a system within a complex of rural activities. Such hindrances inclued lecensing procedures, helath requirements on indstrial premises, notions on industrial loans securities etc. Each of these factors casts its role on the processs in relatb n to other activities and it may determine the nature and extent of influence on other sectors of rural economic life.

3:6:8:3 On a more localised level, there seems to be a need for research which may lead into easy accessibility to information which would help decision makers in locating activities in a specified rural "regions" inpreferably the district. At present, location decisions are made on a rather subjective criteria- in some cases, criteria of

services or potential that has little effect on industrial growth. This is not advocating an inventory of locational determinants but something further than that. It should be a systematic analysis of the level and extent of locational determinants and their possible effects on industrial location and on potential for growth.

Reference and Footnotes:

1. For more detailed discussion of their work, See David M. Smith "Inudstrial Location. An Economic and Geographical Analysis." New York 1971.

2. Tord Palander, 1935, Page 234.

3. See August Losch "The Economics of Location "Yale University New Haven 1954.

4. Op. Cit. No. 1 above.

5. These estimates were made by the Department of Urban and Rural Physical Planning, in 1974 in an unpublished monograph.

6. Kenya National Development Plan 1974-78, Government Printer Kenya.

7. See also Chapter 13 of the Special Rural Development Programme Evaluation Report 1975, Page 13-3.

8. This estimate is based on the findings of a report by F.C. Child, "An empirical Study of Small Scale industry in Kenya" I.D.S. working paper No. 127, Nairobi University 1974 Page 25.

9. Based on consumption patterns of adjacent Mbere Division Embu and compared with patterns of 820 low income families in Nairobi Figures found in Housing Research Unit, Nairobi University.

10. See Figs. 9, 10, 11.

11. In his recommendations on Industrial Estates, F.C. Alexander has advised on emphasising on estates in urban areas through private development and concentrating state support on less endowed areas. See pages 40-53 of "Industrial Estates in India" by this author.

12. Also confirmed by findings of I.D.S. Working Paper 130 of 1973, University of Nairobi. One interviewee has himself trained 4 artisans in 2 years.

13. Taking a patronage of 36,000 and estimated 5% expenditure on industrial goods and services, and a per capita income of 2,400/= per year.

14. See unpublished monograph by Per Kongstad, Industrial Development Research, Denmark "Rural industrial Development Programme, Kenya" Project Paper D75.8 on the Eldoret Industrial Estate.

4: APPENDICES

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14. United Nations "Industrial Estates in Africa" Industrial Seminar ST/CID/5, Sales No. 66.IIB.2, New York, 1965.

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17. Jackson J.N. "Surveys for Town and Country Planning" Hutchson University Library, London 1963.

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4:2 Estimation of Service Area Patronage:

The Kenya Statistical Abstract has given the following break down of wage earners' incomes in urban areas predominating:

K£ p.a. Income Group	Group %	
Below 60	21	
60-119	14	56%
120-179	21	
180-239	13	
240-359	9	
360-479	5	44%
480-599	4	
600+	13	

Table 4:A:2:1 Distribution of Income Groups.

Source: Kenya Statistical Abstract, 1975.

Assuming equal numbers of wage earners in rural area A and Urban area B, and that rural workers on the average earn half as much as the urban workers, then the number of rural workers who would earn as much as a given number of urban workers would have to be twice as many. Consequently, it would be reasonable to assume that there are half as many workers of each income group as there are in urban areas, with the exception of the very highest income groups which may not be available in rural areas. Relating this to similar argument on the per capita incomes based on impressions formed after consulting several entrepreneurs, the author considered the assessment of potential patronage to be within reasonable estimates.

4:3 Distribution of Activities and Employment:

Figures and other information on this table have been obtained through visits to at least 12 centres and interviews of some 15% of the activity owners. This field observation and interviews has been cross-checked with the register of small scale industries at the district trade office. Employment figures have been estimated from a sample interview of about 20% of a cross-section of activities. Outright estimates are put in brackets while those obtained from actual interviews and visits are left without brackets.

One outstanding observation is that the number and diversity of activities, and consequently employment do not show any necessary relationship to the designation of centres; e.g. Sagana, (urban) whose centrality is regarded as superior to Kagio (market), has both less activities and diversity, and almost equal employment level in small scale industries. This does not dictate the future, but indicates the importance (at present of Kagio in this area.

It is also notable that total employment at a centre, without a certain level of diversity, does not reflect the centrality (the service potential) of that place. This is so particularly at Kangaita where employment in tea processing is beyond 100 and for about ten years (mainly due to lack of extra space) no other activity has developed at the centre. Compared to Wanguru, the contrast is considerable as activity has diversified beyond the rice mill and the ginnery to reflect the growth of a community at that centre.

TABLE 4:3:1 Activity Distribution in Kirinyaga

Division	Centre	Activity	ISIC	Employ-ment (Est.)	Total
Ndia	Kerugoya (Urban)	2 Capenters	260	6	
		8 garages	384	15	
		4 tailors	243	5	
		1 Blacksmith	350	2	
		1 Cycle Repair	285	2	
		2 Photographers	-	5	
		1 Flour Mill	205	2	
		2 Cobblers	241	3	
		1 Coffee Factory	200	15	55
	Sagana (Urban)	2 Tailors	243	3	
		2 garages	384	5	
		1 Stone guarry	339	7	
		2 Capenters	260	5	
		1 Block maker	-	8	
		1 Saw mill	251	5	33
	Kagio (Market)	1 Capenter	260	3	
		1 Flour Mill	205	2	
		2 Blacksmith	350	8	
		4 grages	384	15	
		1 Cobbler	241	1	
		1 Ox-Cart maker	-	3	
		1 General Repair	-	2	34
	Kanyokora (Un-Classified)	1 Sugar Crusher	209	4	4
	Kiangai (Local)	1 tailor	243	1	1
	Kibirigwi (Local	1 Coffee Factory	200	18	
		2 tailors	243	3	
		1 Local Brewer	213	3	24

Division	Centre	Activity	ISIC	Employ-ment (Est.)	Total
	Kiine (Un-classified	1 Flour Mill	205	2	2
	Baricho (Rural)	2 Tailors	243	2	
		1 Capenter	260	3	5
	Kagumo (Market)				
		1 Capenter	260	3	
		1 Flour Mill	205	2	
		2 Blacksmiths	350	5	
		1 Cobbler	241	1	
		2 tailors	243	(3)	
		1 Photographer	-	(3)	
		4 Cycle Repairs	285	5	
		2 Garages	384	7	
		1 Radio/T.V. Repair	-	(2)	31
Division total					189
Gichugu	Mururi (Market)	1 Saw Mill	251	4	
		1 Cycle Repair	285	3	
		1 Tailor	243	1	8
	Kangaita (Un-classified)	1 Tea Factory	-	120	120
	Thumaita (Un-classified)	1 Tea Factory (Under Construction)	-	(100)	
		1 Flour Mill	205	2	102
	Kutus (Rural)	4 Tailors	243	5	
		3 Black Smith	350	(5)	
		5 Capenters	260	(8)	
		5 Cycle Repairs	285	(9)	
		1 Photographer	-	3	
		3 Garages	384	11	
		2 Cobblers	241	3	
		3 Saw Mills	251	13	57
	Kianyaga (Rural)	1 Cobbler	241	1	
		1 Black Smith	350	3	
		1 Capenter	260	(2)	
		1 Photographer	-	(3)	9
	Mukarara (Market)	1 Flour Mill	205	2	
		1 Coffee Factory	200	(15)	17
	Kiamugamo (Un-Classified)	1 Coffee Factory	200	(15)	15
	Kiringa (Un-classified)	1 Coffee Factory	200	(15)	15

Division	Centre	Activity	ISIC	Empl.	Total Empl.
Gichugu (Cont..)	Ithareini (Market)	1 butchery 2 Tailors	201 243	(3) (3)	5
Division Total		(Diversity)			349
Mwea	Marinduko (Local)	1 Block Maker 1 Tailor	- 243	5 1	6
	Wanguru (Urban)	1 Rice Mill 5 Cycle Repairs 1 Ginnery 2 Tailors 1 Blacksmith 1 Photographer 1 Capenter 1 Flour Mill	205 285 231 243 350 - 260 205	180 8 (50) 3 2 3 2 2	250
	Kimbimbi (Market)	1 Cycle Repair 1 Flour Mill	285 205	3 2	5
	Kandongu (Local	1 Flour Mill	205	2	2
	Mutithi (Local)	1 Cycle Repair 1 Toilor	285 243	3 2	5
Division Total		(Diversity)			362
Total For 3 Divisions (Centres Studied)					790

Table: 4:3:1 Dispersal of Activities.

Source: Own Survey.

4:4:1. EXISTING PROCESSING SYSTEMS

	PROCESS	INPUT	OUTPUT	DESTINATION	OPTION
200	Coffee Processing	Coffee Berry Water Ganny Bags Chicken Wire Wood Labour	Coffee benas Coffee husks	Market Manure	 Manure
201	Butchery	Livestock Labour	Meat Hides & skins Ofal Bones	Market Market Waster Waster	 Manure Crafts Industry
202	Diary	Milk	Raw milk	Market	-
205	Grain Milling	Grain Labour	Husks Flour Flour Waste	Waster market consumed Waste	- Animal feed Animal feed
206	Baking	Flour Chemicals Energy Labour	Bread and Cakes	Market	
213	Brewing	Sugar Flour Honey Water Grain?	Alcoholic Residuals	Market Waster	 Manure Animal feed
220	Tobacco Curing	Tobacco Raw Energy Labour	Cured Tobacco	Cigarette Market Snuff market	- -
231	Cotton Ginning	 Raw Cotton Chemicals Labour Machinery	Cotton fibre Animal feed Cotton waste	Market Market Market	Local Mattress making

ISI	PROCESS	INPUT	OUTPUT	DESTINATION	OPTION
233	Cordage, Rope and Twine	Sisal fibre Labour	Rope	Market	Enlargement
234	Weaving and Textile Finishing	String Machine Colour Patterns Colour Labour	Cloth Dress	Market Market	
241	Foot Wear	Leather String Gums Tools Colours Labour	Shoes Sandles Belts etc	Market Market Market	Uphostery
243	Clothing	Cloth Thread Tools and machine Labour	Clothing items	Market	Enlargement
251	Sawn Timber	Logs Machine or Tools Labour	Timber Planks Cut-offs Saw Dust	Market Market Waste Waste	- Building shingles Block - Boards Boards
269	Furniture and Fixtures	Timber Fasteners Tools Labour	Furniture Building fixtures	Market Market	- Enlargement
312	Vegetable Animal Oils and Fats	Vegetables Tin cans Fats and oils Machineray Labour	Not existing	N/A	Could be established

	PROCESS	INPUT	OUTPUT	DESTINATION	OPTION
231	Brick making	Clay Brick molds Energy Labour	Bricks Tiles (Not Existing)	Marekt Market (Building)	Can be started
339	Quarrying	Building Rock Building Sand Labour Tools Clusher	Sand Building Stone Hard core Ballast Other goods	Market Market Market Building Industry	Enlargement
350	Metal Smithing	Scrap metal Tools Metal frames Welding Equipment Gas	Jikos Lamps Metal frames goods Miscellaneous Repair	Domestic Use Domestic Use Building industry Agricultural and Transport market.	Enlargement -Specialisation
384	Motor Vehicle Repair	Tools Spares Labour Equipment	Service to transport	Transport market	Specialisation
385	Bicycle Repairs	Tools Spares Labour	service to transport	Transport market	Location convenience.
390	Miscel laneous	Raw Tea Fuel oil Electricity Labour	Tea	Market	

Table: 4:4. : Existing Processing Systems.

Source: Own Survey.

4:5. QUESTIONAIRE FOR INDIVIDUAL INDUSTRIES:

1. (a) Name of Firm .....

   (b) Date of Commencement .....

2. (a) Type of Activity .....

   (b) Type of Premises .....

3. Size (a) Medium Scale .....

   (b) Cottage .....

   (c) Small Inudstry .....

   (d) Large Industry .....

4. Location: (a) Formal industrial area.

   (b) Informal industrial area.

   (c) Elsewhere.

   (d) Would the proprietor wish to locate elsewhere .....

5. Ownership: (a) Sole proprietor .....

   (b) Partnership ..... Number of Partners .....

   (c) Limited Company .....

6. Employees:

Type	Number	Permanent	Casual	Training
(a) Managerial	.....	.....	.....	.....
(b) Technical	.....	.....	.....	.....
(c) Skilled	.....	.....	.....	.....
(d) Semi-skilled	.....	.....	.....	.....
(e) Unskilled	.....	.....	.....	.....

7. Employer:

Origin	Number	Type
(a) Local	.....	.....
(b) District	.....	.....
(c) Outside district	.....	.....

8. Major Raw Materials used:-

	Type	Source	Quantity/Year	Cost
(a)	.....	.....	.....	.....
(b)	.....	.....	.....	.....
(c)	.....	.....	.....	.....
(d)	.....	.....	.....	.....

9. How is the industry financed:

(a) Personal finance .....
(b) Private Loan .....
(c) Bank Loan .....
(d) Government Loan .....

10. Product Marketing:

(a) Individualised .....
(b) Co-operative .....
(c) Wholesale .....
(d) Retail .....

11. Source of Power:

(a) Manual .....
(b) Electric ..... Kw. mains.
(c) Water .....

12. Water Usage ..... gpd Source

13. Machines Used: ..... (a) £5 - £100..... (b) £101 - £200 ....
(c) £201 - £250 ....(d) £250 .....

14. Mode of transport to work (a) Car .....

(b) On foot ....

15. Locational Factors:

(a) For what reason was this firm located here .....

.....

.....

.....

(b) Would the firm be moved if:

1. Premises were found elsewhere .....

2. Plot was allocated elsewhere .....

(c) Has the Propiretor tried to apply for space in another Centre? ..... if so why .....

16. Problems facing the industry :

.....

.....

.....

17. Is the firm to expand: .....

(a) On present site .....

(b) On Another Site .....

(c) Reasons for expansion .....