SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION: A CASE STUDY OF GUSAU

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ABSTRACT

The wide acceptance of the growth centre model as a key concept in regional economic planning clearly reflects the hope that economic prosperity generated in the growth centre will diffuse into the surrounding growth space.

This study examines this notion that growth centres induce further development and higher levels of prosperity over an extensive geographical area. The various processes by means of which such spread effects might take place are examined through the empirical consideration of the relevant spatial flows in the growth space around Gusau. It was discovered that the purchase of foodstuffs by growth centre workers; the purcjjase of industrial raw materials by growth centre firms; and the diffusion of innovations, constitute the main spread mechanisms. The study revealed that direct impact through employment opportunities is minimal. A substantial leakage to other regions of this vital impaot mechanism is thus revealed by the empirical analysis.

A further analysis of the spatial pattern of growth, which relates the level of development in the growth space to proximity to Gusau, shows that the zone of predominant spread effects around the growth centre is largely confined to only 10 to 13 kilometers radius.

Doubts are therefore cast as to the validity of assumptions on the spatial transmission of economic prosperity, and suggestions are offered to improve the effectiveness of the growth centre strategy of

regional development . One such suggestion relates to mechanisms for stimulating strong spread effects while at the same tine cushioning the effects of backwash forces. It is also suggested that for growth centre strategy to be more effective, it should be seen as an integral part of a comprehensive regional development policy.

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* Hausa for (village head or hamlet head) lower order rulers.

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CHAPTER ONE

INTRODUCTION AND THEORETICAL FRAMEWORK

The definition of the research problem and objectives

Development efforts in Nigeria have continued to be concentrated on urban centres to the detriment of the rural areas. The three National Development Plans (1962-68, 1970-74 and 1975-80) have shown an ever increasing urban bias in such programmes as transportation, manufacturing, power supplies, education and other social amenities. The total public sector capital investments in primary production[1] in the three Development plans varied between 13.2 per cent and 14.8 per cent. If public investments are taken as surrogates for the development of the country's vast rural resources, then great injustice is being perpetrated against the rural areas in the allocation of capital investments.

One major explanation for this situation can be found in the two arguments which have typically been invoked to justify deliberate policies of concentrating investments within a few selected centres. "The first is that such concentration engenders certain economies of agglomeration including both external economies accruing to the firm and more tangible economies of scale in the construction and management of the town. The second is that concentration is an efficient means of indirectly promoting higher levels of development over a much wider area" (Moseley, 1972, p. 57). As Berry (1969) would put it, "growth impulses and economic development..... trickle down to smaller places and ultimately infuse dynamism into even the most tradition

bound peripheries" (p. 288). This second argument has thus engendered the optimistic belief that development generated in a growth centre will spread to its surrouding villages, and appears to have been accepted by a vast majority of Nigeria's regional planners. It is this belief in the positive impact of growth centres that perhaps made A. Ayida grant priority to a national development policy "based on growth points and productivity, over a policy of subsidization for economically backward areas" (Ayida, 1971, pp. 17 et seq). A policy of growth centres has since been explicitly incorporated into Nigeria's Third National Development Plan (1975-80) and the planners subscription to the belief of positive spread effects is evidenced in the following plan statements:

> "The urban areas are the main centres of population concentration and of modern industry, commerce and public administration. Many of them have developed into leading growth centres with rapid growing incomes and employment opportunities. Consequently they constitute a powerful attraction to rural dwellers who by contrast depend mainly on agriculture which has been growing much more slowly for their livelihood. The urban and rural areas are in many ways interdependent and the overall development of the economy largely depends on the balanced development of the two. During the plan period therefore policy will be directed towards ensuring that both the rural and the urban areas are equipped for their proper role in the development of the national economy." (Nigeria Third National Development Plan 1975-80, p. 291).

In siting the new Federal Capital territory in the Abuja area of the middle belt, an area believed to be less developed than most other areas of the country, a favourable economic impact to the region was implied. In a normal rural-urban interactive situation as assumed in the above plan statements and implied in the siting of the new Federal

capital, the growth of economic activities in the urban areas should be marked by the expansion of productive opportunities in the rural areas. Yet as pointed out by several other writers, "the worsening of social and economic conditions in Nigeria's rural areas, at a time when all indications are that the economy is growing at an unprecedented rate is a measure of the failure of our urban centres to adequately serve the rural population" (Mabogunje, 1974, p. 87). Despite the increasing attention being given to the ever growing imbalance between urban and rural areas in regional development literature, and the disillusionment of some planners with the growth centre strategy, the approach still continues to guide most planners on the allocation of our national resources. Some of these planners hold very strongly the view that if properly conceived and executed with sustained political will over a sufficiently long period of time, growth centre strategies could be effective in regional development. Indeed, Mabogunje, for instance holds the view "that the creation of a rational spatial system of cities can be crucial for development" (Mabogunje, 1974, p. 88).

In an attempt to account for the widespread acceptance and adoption of the growth centre strategy of regional development, Darwent (1969) ascribed it to the intuitive appeal of the notion of spread efforts. He rightly observed that despite the flimsy theoretical background and the lack of empirical verification, there is nonetheless a great deal of intuitive appeal in the notion of a growth centre in which economic and social development is transmitted to an area around it" (Darwent,

1969, p. 13). To this intuitive appeal can be added a paucity of other suitable strategies for spatial allocation of investments. Ajaegbu (1976) enumerated some of these other strategies adopted in Nigeria, such as farm estates, plantation programmes, farm settlements, rural industries etc. - and states that the spread effects of many of these major government programmes "have been non-existent or very minimal inspite of the high financial cost involved in setting them up" (p. 73). Thus while there is some dissatisfaction with the body of theory and concepts of growth centres as a tool for alleviating rural poverty, there is as yet little of comparable theoretical strength to put in its place.

The thesis that economic change usually 'trickles down' from urban centres to rural regions, has led to a salutary neglect of the rural areas by planners. Despite the growing literature on growth centres in Nigeria, there has been very little specific research undertaken on growth centre impact, with a view to establishing in quantitative terms the dimensions of the spread" and "backwash" effects. As Hoover would put it, "we do not yet know much particularly in quantitative terms, of the way in which a favourable economic effect is propergated from an urban growth centre to the surrounding territory or the range and speed of the various impacts" (Hoover, 1969, p. 352).

It is this particular problem that has motivated this investigation. This study will examine to some depth, the contention that the benefits of growth centre expansion usually spread beyond the

latter's immediate confines. Various processes by means of which such spread effects might take place will be considered with a view to determining their nature, scale and spatial extent. Since the processes will be analysed at one point in time, it will not be possible to consider their speed. However, it is hoped that with the scope of the project it may be possible to contribute effectively to the debate on the suitability of the growth centre model to the Nigerian rural situation.

The Growth Centre Model

There has not emerged as yet a comprehensive theory of growth centres, but in the numerous texts on regional economics and economic geography, there is a body of ideas that can be grouped to constitute the growth centre model. The first group of such ideas focusses on the fast growing centre and the analysis of the internal mechanism of growth. This group of ideas is clearly associated with the work of Perroux (1955 and 1961) and other French writers. In essence the idea of growth centres is that development does not occur at the same rate everywhere. Rather it tends to concentrate in certain parts which thereby develop as "growth poles" expanding much more rapidly than the surrounding areas.

Perhaps it is appropriate here to distinguish between 'growth poles' and 'growth centres', as semantics can lead to basic conceptual problems with growth centre theory of regional development. It has been argued that the 'growth pole' concept has to do with economic

space rather than geographic space. According to Perroux (1950) growth poles are "..... centres (poles or focii) from which centrifugal forces emanate and to which centripetal forces are attracted. Each centre being a centre of attraction and repulsion has its proper field which is set in the field of all other centres" (p. 27). Such 'poles' are likely to be firms or industries which are generating new growth. But economic space has locational implications. Darwent (1969) distinguishes "between economic space in which poles are defined and geographic space in which they happen to have a location" (p.7). Following Darwent (1969) the term "growth centre" refers to the geographical locus of growth while "growth pole" refers to propulsive industrial establishments.

Growth centres are almost invariably regarded as urban and industrial in character (Rostow, 1964, pp. 123-124) while some writers have implied that they are also usually to be found close to the centre of a particular region. Agglomeration economies and the theory of cumulative causation have been used to explain their internal mechanisms of growth. Further consideration will be given to this aspect of the model in chapter two.

A growth centre is supposed to have profound reciprocal effects on its surrounding region and the second group of ideas relate to the analysis of relationships between the growth centre and its surrounding territory. It is to this group of ideas and the empirical issues they raise that the main body of this research is devoted. The argument

is that growth will first of all begin in the centre and then diffuse to the surrounding areas. "The growth pole model depicts the transmission of economic prosperity as the resultant of two sets of forces. On the one hand, growth tends to concentrate in some centre and erodes the economic base of surrounding areas; on the other hand, development spreads over surrounding areas as the result of growth in the centres. All this is seen over the area in which the centre and surroundings interact, the growth space" (Robinson and Salih, 1971, p. 303). The spread effects and backwash processes therefore constitute the mechanisms of growth centre impact and may be defined as a complex set of processes including various flows of labour, capital, food and raw materials, government investment and the diffusion of innovation (Gaile, 1976, p. 2). If these processes result in a spatial impact of positive increase in the absolute level of development, a spread impact is recorded. If the resultant spatial impact of the processes is a decrease in the absolute level of development we have a backwash impact.

Spread effects

The spread effects of growth centres comprise those forces which promote a more even distribution of economic development. The spread mechanisms may take the following forms:

(a) The expansion of demand for industrial raw materials: The demand of manufacturing industry for agricultural products, actuates induced growth processes when it results in an increase

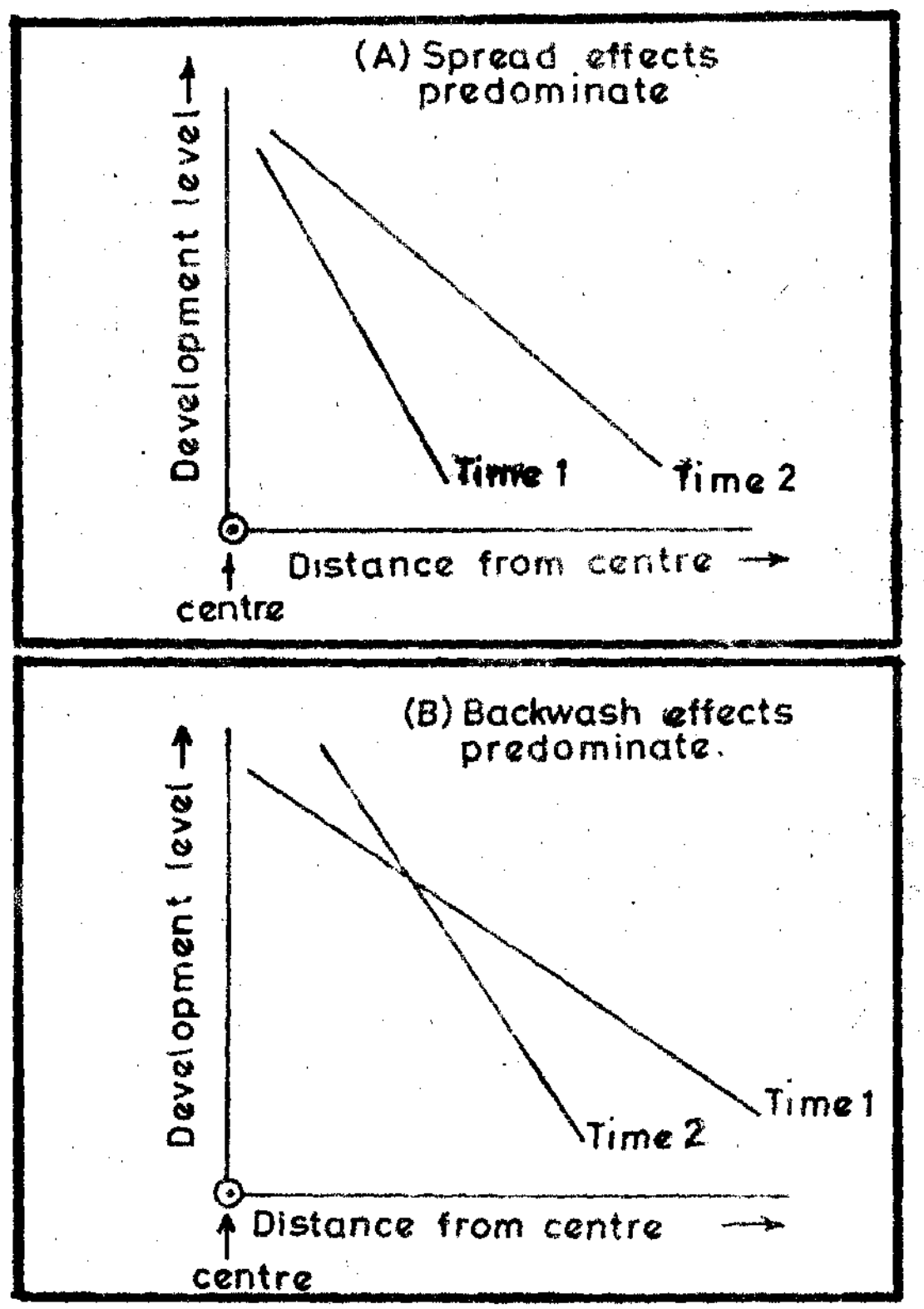


Fig 1: Spread and backwash effects over space & time
(After Mosely, 1974)

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(a) The expansion of demand for industrial raw materials: The demand of manufacturing industry for agricultural products, actuates induced growth processes when it results in an increase

in the production volume of domestic agriculture. But it can also be argued that even to maintain sufficient demand for raw materials is surely a favourable effect.

(b) The stimulation of increased food production in the growth spaces: The increasing urban population at the centre would require an increasing supply of foodstuff and this may stimulate increased food production in the growth space.

(c) The introduction of commercial farming techniques to the countryside: Resulting from the two points above commercial farming techniques may be introduced to the countryside.

(d) The employment of surplus rural population in growth centre industries:

It could be that the surrounding rural areas may be relieved of pressure over the land: The surplus rural population may be absorbed in the industries of the growth centres. This can also mean that agriculture can be rationalized and mechanized in the rural areas. It is also conceivable that some of the rural migrants employed by urban industries may make remittances to their home villages.

(e) The diffusion of innovation:

There may be contact induced changes in the value systems of the rural community and the effect of such a change may be to make the rural population more productivity conscious. One important form of these contact induced changes referred to above is the spatial diffusion of innovations. From the growth

centre innovations may spread into the surrounding rural growth space.

(f) The decentralization of urban population and industries after a certain level of urban growth:

Another form of spread mechanism is the decentralization of urban population, industry and other institutions, after a certain level of urban growth has been reached. This may help to generate growth in the peripheral areas. This form of spread mechanism may not concern us in the present investigation as Gusau does not seem to have attained such level of growth as to necessitate decentralization. In places such as Lagos, Ibadan, Kano, Kaduna, Jos, Enugu and Port Harcourt, however, this form of influence may assume greater importance.

Backwash effects

The backwash effects refer to the processes which tend to accentuate the spatial disparity in economic development. They are caused mainly by highly selective rural-urban migration of virile labour force. Generally the people who move are the young and largely male - usually the most virile and enterprising group. The weak - mainly women and the aged are usually left behind. Rural labour force may be attracted by the employment opportunities generated at a growth centre and such migration tends to accentuate spatial inequalities in the distribution of employment opportunities between the growth centre and its growth space.

There is also the flow of financial capital from the growth space to the growth centre, largely because of the greater returns on capital investment in the latter. Moreover, rural migrants may carry with them whatever financial capital they might have accumulated. In the exchange of rural and urban goods and services there is likely to be an imbalance tilted in favour of the urban produced goods and services. This constitutes another form of capital flow from the rural to urban areas. Finally there is this contention that mass produced urban goods will tend to flood the rural market areas, ruining rural 'cottage' industries and initiative. It is argued therefore that "unless appropriate policies are designed to check such flows, (of labour force and financial capital) the areal distribution of essential resources would become even more lopsided and geographic imbalances all the more severe" (Gana, 1978, p. 13).

But of course the growth centre model assumes that within the growth space the spread effects from the centre would be greater than the other spatial elements, (Robinson and Salih, 1971, p. 304). The contention is that with the passage of time levels of development would become spatially more even (Fig. 1a) rather than more uneven (Fig. 1b)

Both the above contention and Berry's cliam that "the spatial incidence of economic growth is a function of distance from the central city ....." (1969, p. 268), remain to be empirically proved.

The concept of spread and backwash effects, a spin off from the vigorous academic debate on "balanced versus imbalanced" economic growth among development theorists, is clearly described in the "cumulative causation model elaborated by Myrdal during the mid-1950's. Myrdal's model is based on the contention that in a free economy, particular changes do not "call forth countervailing changes but, instead, supporting chnages, which move the system in the same direction as the first change but much further" (Myrdal, 1957, p. 13). Thus the play of free market forces works towards inequality between regions and such inequality is reinforced by the movements of capital goods and services, termed "backwash effects"by Myrdal. Also of significance are certain centrifugal 'spread effects' of expansionary momentum from the centres of economic expansion to other regions" (Myrdal, 1957, p. 31). Myrdals statements are reinforced by similar but independent statements of Hirschman (1958) and others. Hirschman attributes the key role in differential growth to interaction between growing and lagging regions in the form of "trickling down" and "polarization" effects. These are, as Hirschman himself agrees, the exact counterpart of Myrdal's "spread" and "backwash" effects, (Hirschman, 1958, p. 187). These formative statements have been enhanced by several others, most notably by Friedmann (1966 and 1969).

The core-periphery model provides the best conceptual framework for the consideration of relevant processes in the spread of development away from a growth centre. The model was set out by Friedmann and Alonso (1964) in the following terms:

> "Centres not only grow so rapidly as to create problems of entirely new order, but they also act as suction pumps pulling in the more static regions. The remainder of the country is thus relegated to a second class, peripheral position. It is placed in a quasi-colonial relationship to the centre, experiencing net out-flows of people, capital and resources most of which redound to the advantage of the centre where economic growth will tend to be rapid, sustained and cumulative" (Friedmann and Alonso, 1964, pp. 2 and 3).

Friedmann (1966) further developed this theoretical position in his book Regional development policy: a case study of Venezuela, claiming the core-peripery model to be widely applicable and independent of scale (pp. 10-13). He goes further to suggest the typical product of the interaction of forces of "spread" and "backwash" and presented a typology which describes a sequence of regions with common prospects and problems resulting from the various core periphery processes. Five types of regions were identified; namely:

(a) Core regions

(b) Upward transitional areas

(c) Downward transitional areas

(d) Resource frontier regions

(e) Special problem regions.

The first three regions, roughly arranged concentrically, form Friedmann's conception of the space-economy, and provides the framework with which to study the extent and nature of the various processes.

"Core regions," analogous to the concept of growth centres, are characterised by their high promise for economic growth (ibid, p. 41). Friedmann refers to a hierarchy of core regions each constituting the driving force of the region in which it is set. "There are the upward transitional areas" whose "natural endowments and location relative to core regions suggest the possibility of greatly intensified use of resources". They are also areas of net immigration and the economic development of these areas "will generally occur as a response to rising commercial demand at the core" (ibid, p. 41).

"Downward transitional areas" are old, established settlement regions whose essentially rural economies are stagnant or in decline and whose peculiar combination of resources suggests as optimal a less intensive development than in the past (ibid, pp. 42-43). Characteristically these are areas of net and selective out-migration, ageing and unfavourable industrial structure, low agricultural productivity and of generally low standard of living.

The growth space

The growth space can be defined as the zone of effective interaction between the growth centre and its surrounding regions. An idealized development surface resulting from growth centre impact can be presented diagramatically as shown in Fig. 2 below. If we assume a single growth centre with optimal internal growth processes; with peripheral areas which are homogeneous in terms of human and natural resources; terrain devoid of physical barriers; the possibility of

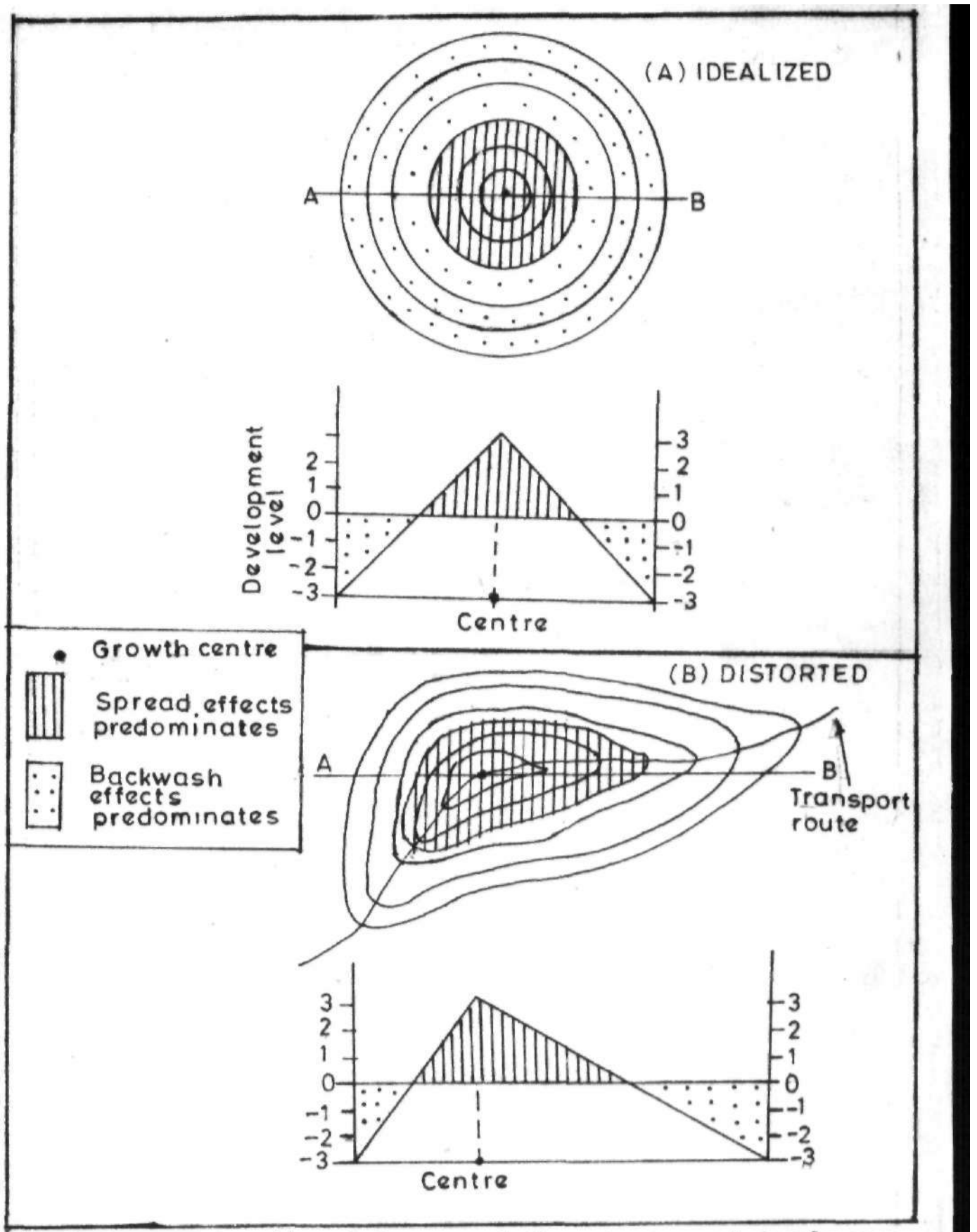


Fig.2: Conceptualized forms of Development surfaces around a growth centre.

movement in every direction and the rationality of human behaviour, then we shall have a concentric downward gradation of development levels, outwards from the growth centre (Fig. 2). But these assumptions rarely hold in reality, and so certain distortions of the above idealized form of the development surface (Fig. 2b), should be expected. Distortions may be caused by such factors as transportation routes, physiographic features, differential resource endowment and the effects of secondary centres within or outside the growth space. Other causes of distortion include population distribution, educational levels and response rates to innovations. In fact it is more reasonable to assume multiple growth centres of varying sizes and importance within a growth space.

Hypotheses being considered

From the above theoretical review there emerges the hypothesis that around any given growth centre a broadly concentric series of development surfaces might be expected, the major feature being an "upward transitional zone" close to the centre where spread effects predominate, with a "downward transitional zone" beyond. Such zones would be arranged concentrically around the growth centre except where interrupted by localized resources or barriers, channels of communications, other urban centres etc. (Moseley, 1974, p. 121). A number of more specific questions relating to the nature, scale and extent of impact which this generalized model raises provide the focus for this research. The issues raised include:

(1) What is the relative importance of the various channels of impact such as labour market, backward and forward linkages income distribution and innovation diffusion?

(2) How much impact is normal within the growth space or put differently, how much leakage is there to other regions?

(3) How far away from the growth centre is the external boundary of the zone in which spread effects predominate i.e. "the upward transitional zone"?

These could further be broken down into even more specific questions, including:

(a) To what extent does the development of a growth centre generate in-migration?

(b) To what extent does such migration originate beyond the commuting hinterland?

(c) Whether such migrants are attracted to the growth centre by directly created employment of the manufacturing firms or by the demands of an expanded service sector?

(d) To what extent do firms moving to a growth centre make use of raw materials and industrial services within the region?

(e) What sort of places within the region benefit most from such expenditure?

(f) Whether satellite firms have been attracted to the centre by the parent firm's expansion?

(g) Whether the markets of the growth centre firms have become more regionally oriented?

Underlying the hypotheses set out above are the assumptions that propulsive manufacturing activities or 'lead firms' will always generate sizeable employment/income growth impact in close proximity to the location of their operation as a consequence of the creation of backward and forward linkages and employee income expenditures. Secondly, that economic innovations are supposedly adopted in the first instance by the largest metropolitan centres at the apex of a regional system of cities and then diffused subsequently to lower centres within the region.

Methodology

Data sources and sampling methods.

Six questionnaires A to F were constructed to provide information on a wide range of variables considered relevant to the study. Questionnaire A aimed at collecting information on the sampled villages. Some of the items of this information include name, estimated population, distance from Gusau, schools, health services, shops etc. (Appendix A1). The village head, some members of the village council, the school headmaster, shop owners and a number of other village elders helped to provide most of the information about the village required here. For the purpose of selecting my sample villages, a map of the Gusau region was divided into four sectors by lines which intersect at a point inside Gusau town - precisely at the Zaria-Sokoto-Gusau-Kaura roads junction. Then concentric zones, about five kilometers apart were drawn on the map. These zones were numbered one to six from inside outwards.

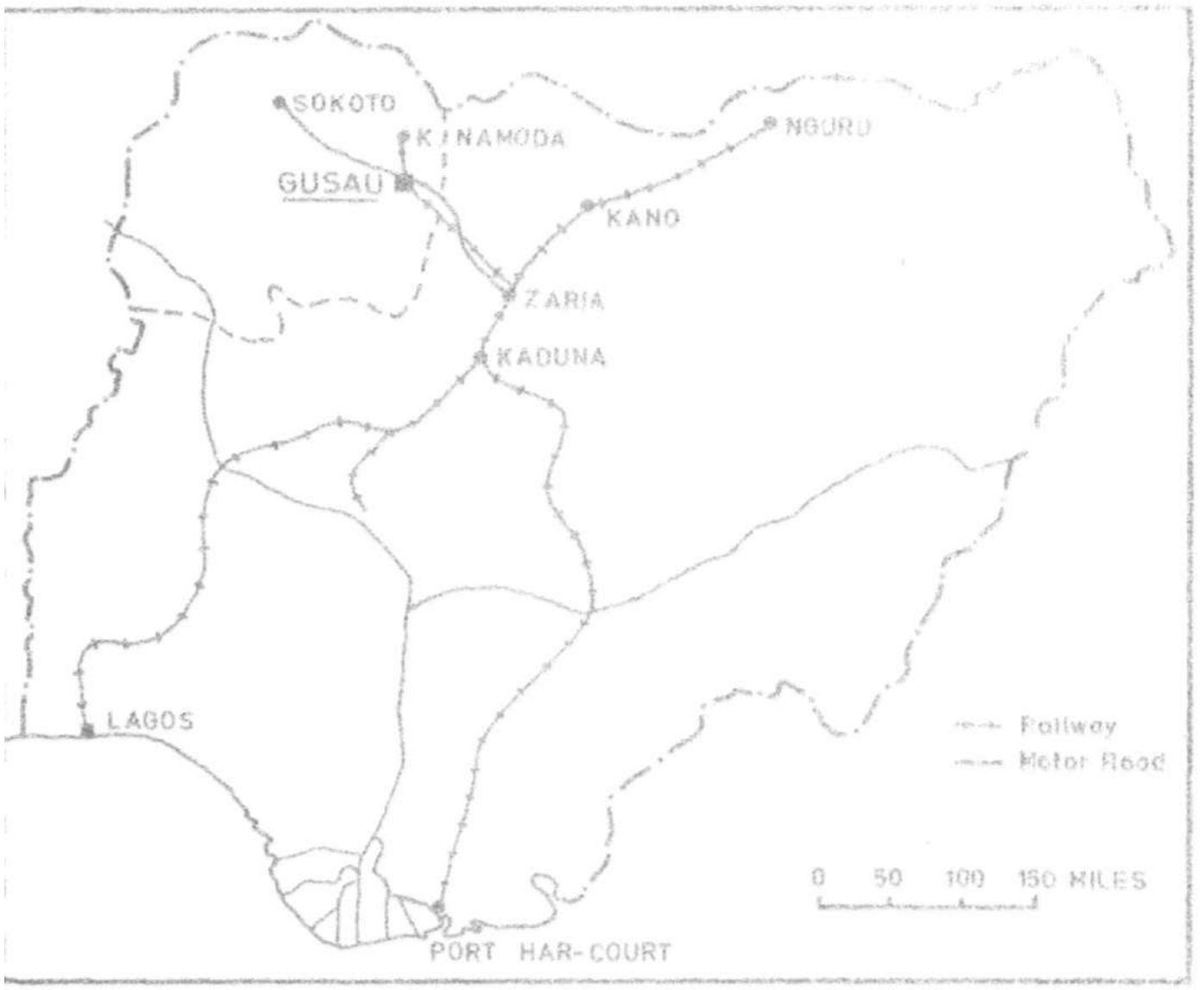


FIG.3 MAP OF NIGERIA SHOWING THE LOCATION OF GUSAU IN SOKOTO STATE

All the six villages in zone one were chosen. Eight villages, two from each sector, were chosen from zone two. Twelve villages, three from each sector were chosen fron zones three to six. This gives a total of 62 villages randomly chosen. The main objective of this sampling method was to ensure that samples were obtained which are at progressively regulated distances away from the growth centre. Data was collected from about 42 of the original 62 villages chosen. Certain areas south of the river Sokoto proved difficult to penetrate within the period available for data collection. Poor accessibility and other related difficulties therefore prevented the coverage of the 20 villages (Fig. 4).

Questionnaire B provides a format for interviewing respondents in the sample villages. 20 household heads were randomly selected in each village and interviewed.

Questionnaire C facilitates the industrial survey of Gusau. It was used for interviews with the management of all the major manufacturing establishments in Gusau. This contains questions on general information relating to the status and age of the establishment. Other questions relate to the product; number, skills and recruitment of personnel; existence and spatial pattern of links with other establishments; and markets, materials, expenditure on labour and turnover. Seven factories were covered.

Questionnaire D was designed for industrial workers survey and supplements the industrial survey. Five per cent of all the workers

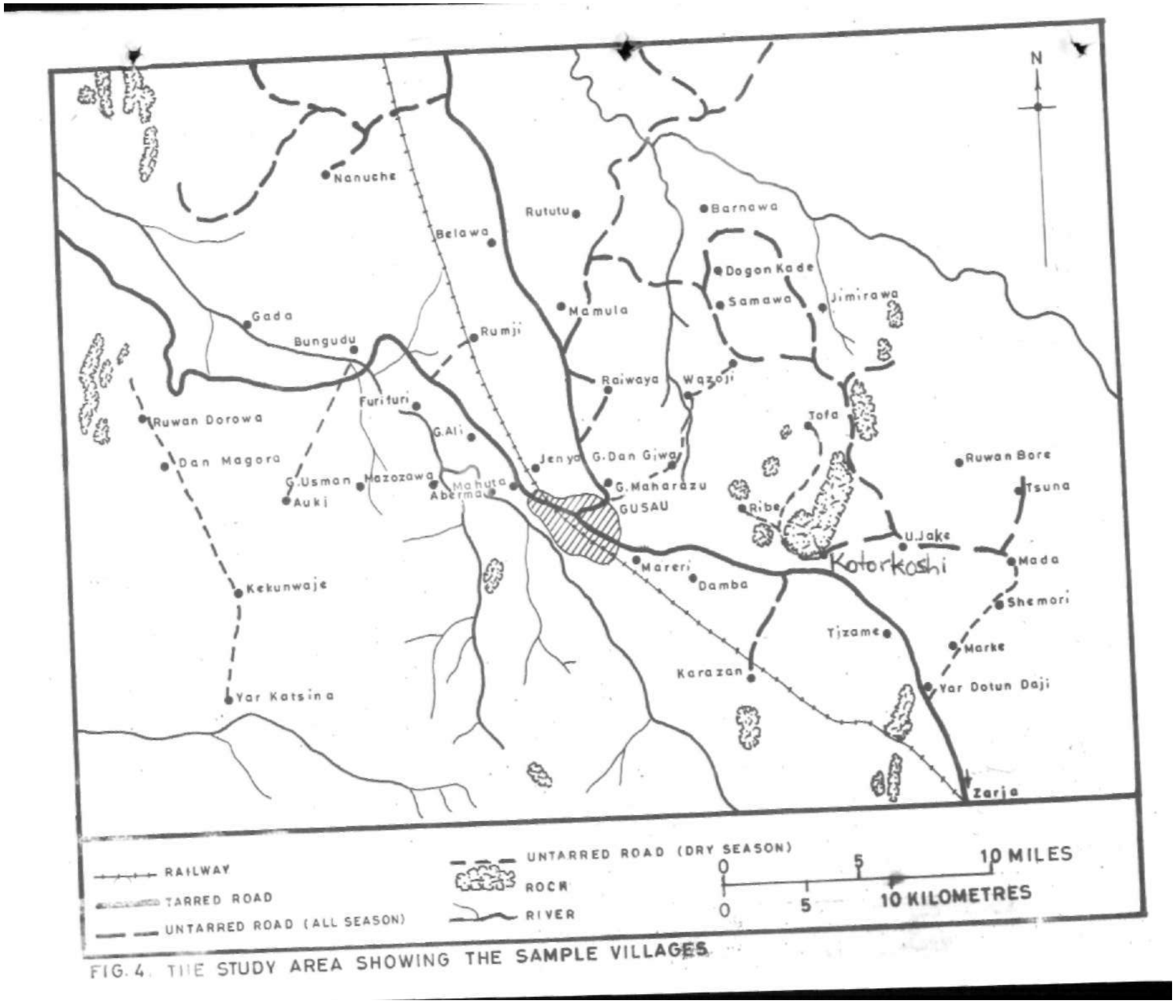


FIG. 4. THE STUDY AREA SHOWING THE SAMPLE VILLAGES

in the seven factories - a total of about 104 people were randomly chosen and interviewed.

Questionnaire E was so constructed as to facilitate the survey of Gusau residents. Topics investigated include place of origin, present and previous occupations and shopping habits - very much like those investigated with questionnaire D. A random five per cent sample of Gusau residents covering all the various wards of the town was taken. This yielded a total of about 626 household heads who were interviewed.

Questionnaire F provides information on the flows of foodstuffs, firewood and other materials into and from Gusau. Nine counting points covering all the major routes from the surrounding villages into Gusau market were selected. Two days - one, a market day and the other a non-market day were chosen for the count. Later on a third day - a market day, was chosen to count commodity flows on two of the routes (1 and 2) (Fig. 5). The areas covered by these routes could not be penetrated for inclusion in my sample villages due to very poor accessibility. By the time of this later count the rains had come and the river Sokoto was posing greater communication problems (Plates 1 and 2). The idea was to measure the reduction in commodity flow resulting from this increased difficulty of access. In all the counts, types of commodity, origin, destination quantity, unit of measure and price per unit of measure were recorded.

Besides the information collected through these questionnaires

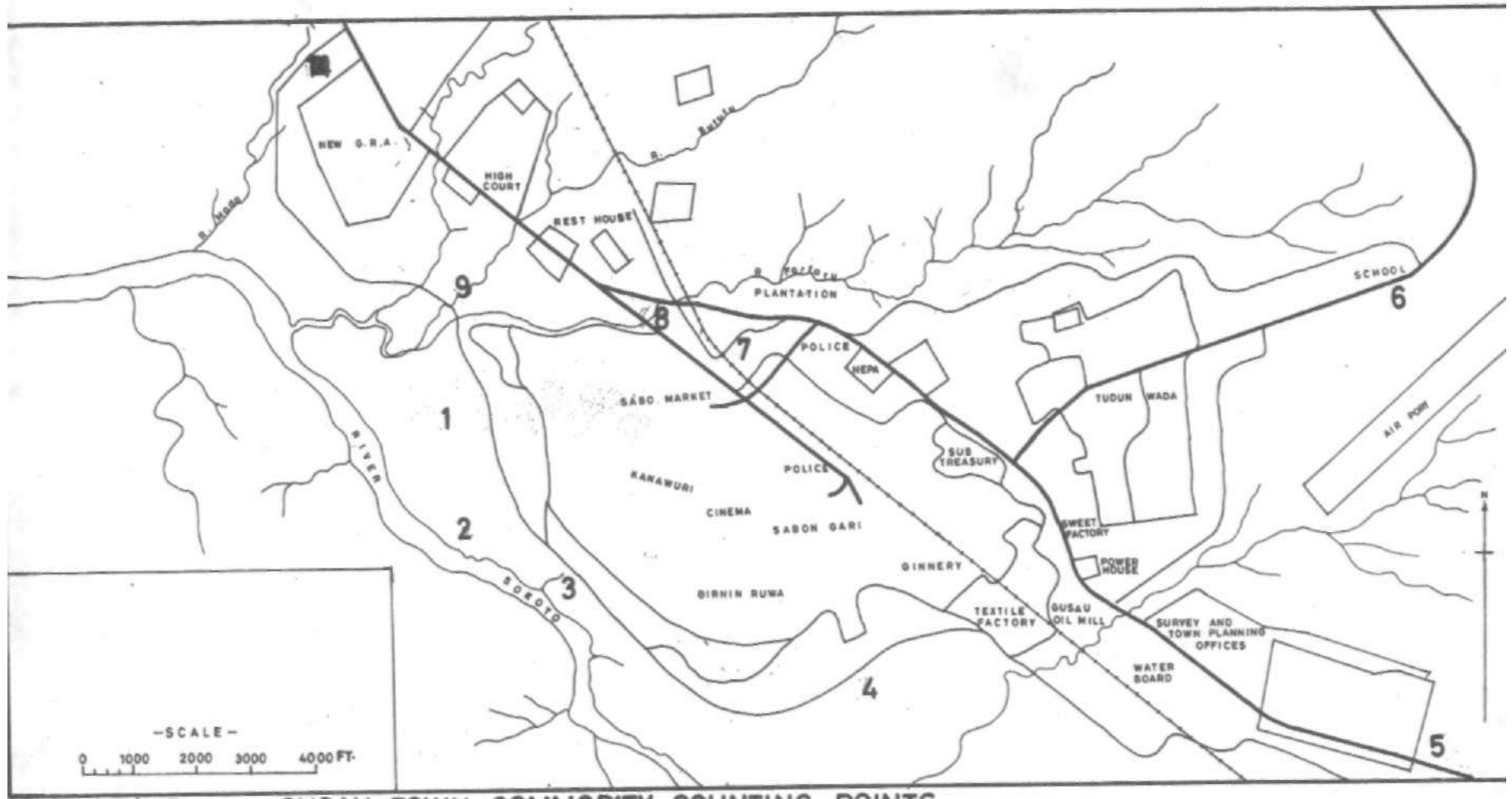
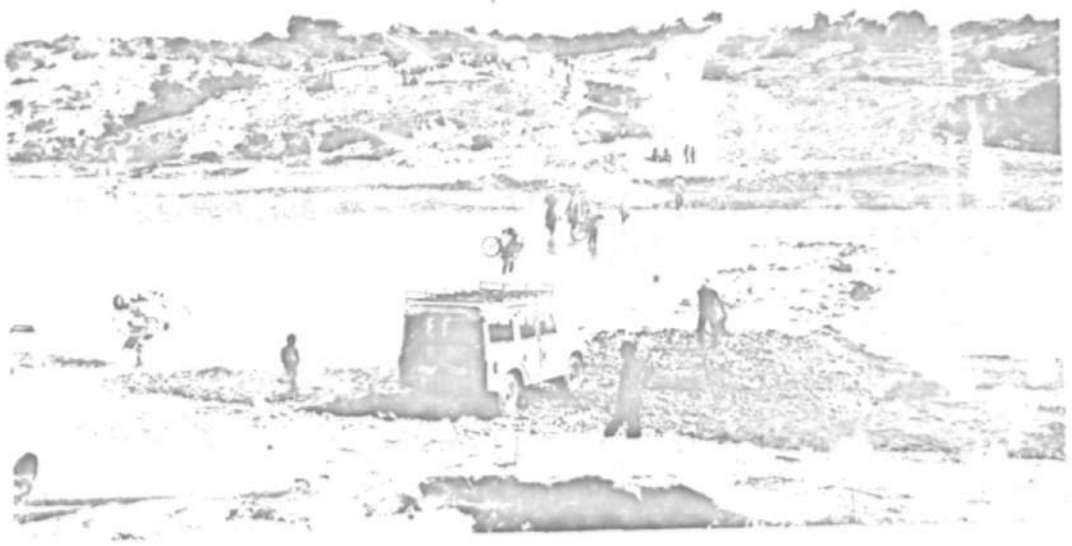


Fig.5 GUSAU TOWN COMMODITY COUNTING POINTS

RIVER SOKOTO: Now posing greater communication problems.

1



Motor vehicles link is now cut off and even bicycles have to be carried on the head by people wading knee deep across.

2



other sources of information include the Banks, the National Electric Power Authority (NEPA), Gusau Water Board, Gusau Agricultural Development Project, the Cotton and Groundnut Boards and the Produce Office in Gusau as well as the Gusau Local Authority.

Techniques of analysis

Two analytical techniques will be employed mainly in chapters three and four. The first involves empirical consideration of the various spatial flows considered relevant. The second involves the generation of a set of development levels for the 42 villages selected in the study area and the mapping of the development surface.

The application of both the "flow" analysis and the response pattern analysis to the Gusau region owes much to the suggestion of Robinson and Salih (1971) that it would be preferable to apply both techniques to a single study area in an attempt to build an integrated process - response model in which our understanding of both processes and form are enhanced by their successive consideration.

In drawing up an operational framework for the examination of the hypotheses and the questions raised attempt was therefore made to bring together the usual division in the relevant literature on urban impact between, on the one hand, studies of processes focussing on the various flows and channels of impact and on the other hand, studies of form which attempt to relate the surface of development to growth centre proximity.

The key chapters in the dissertation are, therefore, chapters

three and four. In chapter three as mentioned above, diffusion of prosperity will be examined by a strictly empirical consideration of the relevant spatial flows. In chapter four, relationship between proximity to the growth centre and the level of rural prosperity will be inferred by the application of statistical tests of significance to hypothesized spatial patterns. But an evaluation of a centre's ability to generate growth stimuli above the threshold for response would necessitate the examination of the internal growth components of the assumed "pole" (Robinson and Salih, 1971, p. 312) and so chapter two will try to identify Gusau as a growth centre.

Footnotes

1. Agriculture livestock, forestry, fishery mining and quarrying.

2. To define the Gusau region, two concepts of regionalism were employed:- the planning region and the functional region. Starting with the former, the northern part of Gusau Local Government area, comprising parts of Bungudu, Gusau and Kotorkoshi districts were demarcated. But it was realized that the region of effective interaction cuts across the administrative or planning region, and so parts of Kaura Namoda and Anka Local Government areas were included. In fact a circle of about 35 km radius with Gusau at the centre defines the area called the Gusau region or the growth space.

CHAPTER TWO

GUSAU AS AN INDUSTRIAL GROWTH CENTRE

A precise and generally accepted definition of a growth centre does not exist as yet and as Gana (1977) rightly pointed out "much of the problem with the use of a growth centre strategy derives from the conceptual confusion regarding the definition of a growth centre" (p. 207). The several general definitions that exist, though containing certain recurrent themes remain mostly inconsistent one with another. Consider for example the following two definitions:

> "A main centre at the regional level which, in addition to its function as a regional centre, also provides a prosperous and reasonably diversified industrial structure. The centre should either be growing, or show potential for growth of economic activity, employment, population and income. Such a centre will, ceteris paribus, need to be above a certain population level, or if it is to enjoy self-sustaining growth, be planned for such a level (Allen and Hermansen, 1968, p. 64)

and

> "..... an urban centre of economic activity which can achieve self-sustaining growth, to the point that growth is diffused outward into the pole region and eventually beyond into the less developed region of the nation"(Nichols, 1969, p.193).

It would be noted that emphasis vary and the relative importance of the fundamental characteristics are not explained. Besides, such "general definitions are rather unhelpful in the sense that what may represent a growth centre in a developing region, may be viewed quite differently if located in a developed region" (Gana, 1977 , p. 17).

Arising from the above difficulties with their definition, attempts at identification of growth centres have remained few and

unique. Methods of identification have varied from "purely intuitive to the use of multivariate techniques on huge data matrices but containing data of different types" (Brookfield, 1975, p. 107). This fact has led Moseley to suggest that perhaps growth centres exist as such "only in the eye of the beholder" (Moseley, 1974, p. 18).

Moseley's working definition therefore becomes attractive to us in our attempt to identify Gusau as a growth centre. A growth centre is here defined as "a town which recently experienced, or is presently experiencing, or is planned to experience rapid growth" (Moseley, 1974 p. 19). Since the proponents of the growth centre model attribute the growth of a centre to the expansion of propulsive industries located within it, Gusau will be shown in this chapter, to be experiencing rapid growth in propulsive industries and hence population. It will also be shown that internal population concentration is being expressed in rapid spatial expansion. The cumulative causation process will be traced in all this rapid growth.

Growth of Gusau: the expansion of propulsive industries and population

Growth industries are defined as industries actually generating growth impulses, attracting labour and producing articles. Despite some differences of emphasis three basic characteristics of a pro pulsive firm emerge from the relevant literature.

(a) It must be large in order to assume that it will generate sufficient direct and potentially indirect effects to have a significant impact on the regional economy. It is thus

argued that the multiplicity of small firms of small dimension working in dispersed fashion, without relying on a few large firms, do not set in motion a truly dynamic regional economy (Hansen, 1967).

(b) It must be relatively fast growing. It is reasonable to expect a propulsive firm to be rapidly growing.

(c) The quantity and intensity of its interactions with other sectors should be important so that a large number of induced effects will in fact be transmitted.

About eight manufacturing firms in Gusau qualify therefore to be called propulsive firms and our consideration of Gusau industrial growth will be limited to seven of these about which information is available. The first of these factories, a cotton ginnery owned by the British Cotton Growing Association (now known as Cotton and Agricultural Proccessors Ltd.) was established in 1926. Between 1926 and 1965 when the second factory was established a number of other developments associated with the establishment of the ginnery took place. These include the extension of a railway line from Zaria to Kaura Namoda in the north east of Gusau, in 1929; the operation of road motor services from Gusau to Sokoto by the Railway; the establishment of certain commercial firms which also served as produce buying agents for the Marketing Board, the only supplier of seed cotton to the ginnery. The remaining six factories came between 1965 and 1976. Table one shows the age and size of each of the establish-

ments being considered and Fig. 6 shows graphically the growth in the number of propulsive industries from 1926 to 1976.

Table 1: Age and size of the propulsive industries in Gusau

Name of Establishment	Date established	Present capital (₦000)	Labour force in 1977
1. Cotton and Agricultural Processors Ltd. (Ginnery)	1926	3,000	307
2. Zamfara Textile Industries Ltd.	1965	4,500	1079
3. Gusau Tanning Co. Ltd.	1967	264	88
4. Gusau Metal Construction Factory	1972	40	62
5. Gusau Sweet Factory Ltd.	1972	400	100
6. Gusau Oil Mill Ltd.	1974	8,500	197
7. Muhammadiya Metal Factory Gusau	1976	2,250	100

Source: Field survey 1977

In terms of growth in capital investments, table 2 shows the growth rate for each of the establishments under consideration except for cases where complete information is not available. The formula[3] used for the computation of the growth rate is the generally applicable one of:

$$r = \left(\frac{\log C_1 - \log C_0}{t} - 1\right) \times 100$$

where r = annual growth rate of investment capital

C_1 = present capital

C_0 = initial "

C_0 = previous capital

t = time period between the above two figures

(i.e. date of establishment to 1977).

Table 2: Growth rate of investments in the seven industrial establishment to 1977).

Name of Establishment	Date established	Initial capital ₦000	Present capital ₦000	Annual growth rate
1. Gusau Agricultural Processors Ltd.	1926	x	3,000	x
2. Zamfara Textile Industiry Ltd	1965	1,950	4,500	7.3%
3. Gusau Tanning Co. Ltd.	1967	80	264	12.7%
4. Gusau Metal Construction Factory	1972	26	40	9.0%
5. Gusau Sweet Factory Ltd.	1972	200	400	14.9%
6. Gusau Oil Mill Ltd.	1974	5,500	8,500	15.6%
7. Muhammadiya Metal Factory Gusau	1976	2,250	x	x

Source: Field survey 1977

The average annual growth rate of industrial investments in Gusau is therefore computed to be about 11 per cent in 1977. This computation excludes the 15.6 per cent recorded for Gusau Oil Mill Ltd since it will be misleading to include it (see footnote 4).

While data is not available from my field survey to assess the growth in industrial employment in Gusau, Ludwig Schatzl's analysis of industrialization in Nigeria offers some useful information on this

subject. In 1969 Gusau had a high proportion of industrial workers - about two per cent of the total population. "Of the 66 towns with inhabitants totalling 20,000-100,000 contained in the population census of 1963, only six achieved a share of industrial workers of more than one per cent" (Schatzl 1973, p. 133). This share of two per cent for Gusau is comparatively high, especially when it is realized that on the national average in 1969, less than 0.2 per cent of the population was employed in the modern industrial sector (p. 132). Nigeria's industrial employment increased by about 33,500 between 1965 and 1969 (Table 3), excluding the eastern states.

Table 3: Increase in Nigeria's industrial employment figure between 1965 and 1969 (excluding eastern states)

Town	Absolute increase	%
Lagos	16,000	47.8
Kaduna	7,500	22.4
Kano	4,000	11.9
Ibadan	1,300	3.9
Jos	1,300	3.9
Gusau	1,300	3.9
Others	2,100	6.2
Total	33,500	100

Source: (Schatzl 1973, p.71)

The greatest absolute gain in industrial employment was observed in six industrial locations - Lagos, Kaduna, Kano, Ibadan, Jos and

Gusua - which together accounted for 94 per cent of the total absolute employment gains in Nigeria. The above information, though skeletal, constitutes adequate evidence that Gusau has had rapid growth in industrial employment.

Other surrogate measures which can be used to demonstrate this rapid growth include, population size, bank deposits, power consumption and consumption of treated pipe-borne water.

Table 4: Gusau Town - population figures and rates of growth

Census Year	Population	Increase	Annual growth rate %
1914	9,228	x	x
1921	10,412	1,193	1.7
1931	14,878	4,226	3.6
1952/3	40,202	25,324	4.6
1963	69,321	29,028	5.5

Source: National Archives Sokprof S2513, National Population Census 1952/3, 1963.

Table 4 and the graphical presentation of population growth in Fig. 7 show that the population of Gusau is not only growing in absolute figures, but it is also growing at an increasing rate. When compared with the national annual growth rate of 2.5 per cent in 1963 (Federal Office of Statistics), Gusau's growth rate of 5.5 per cent can be described as phenomenal.

Bank deposits in Gusau have also been growing quite rapidly also. Using data from one of the commercial banks in Gusau, this rapid

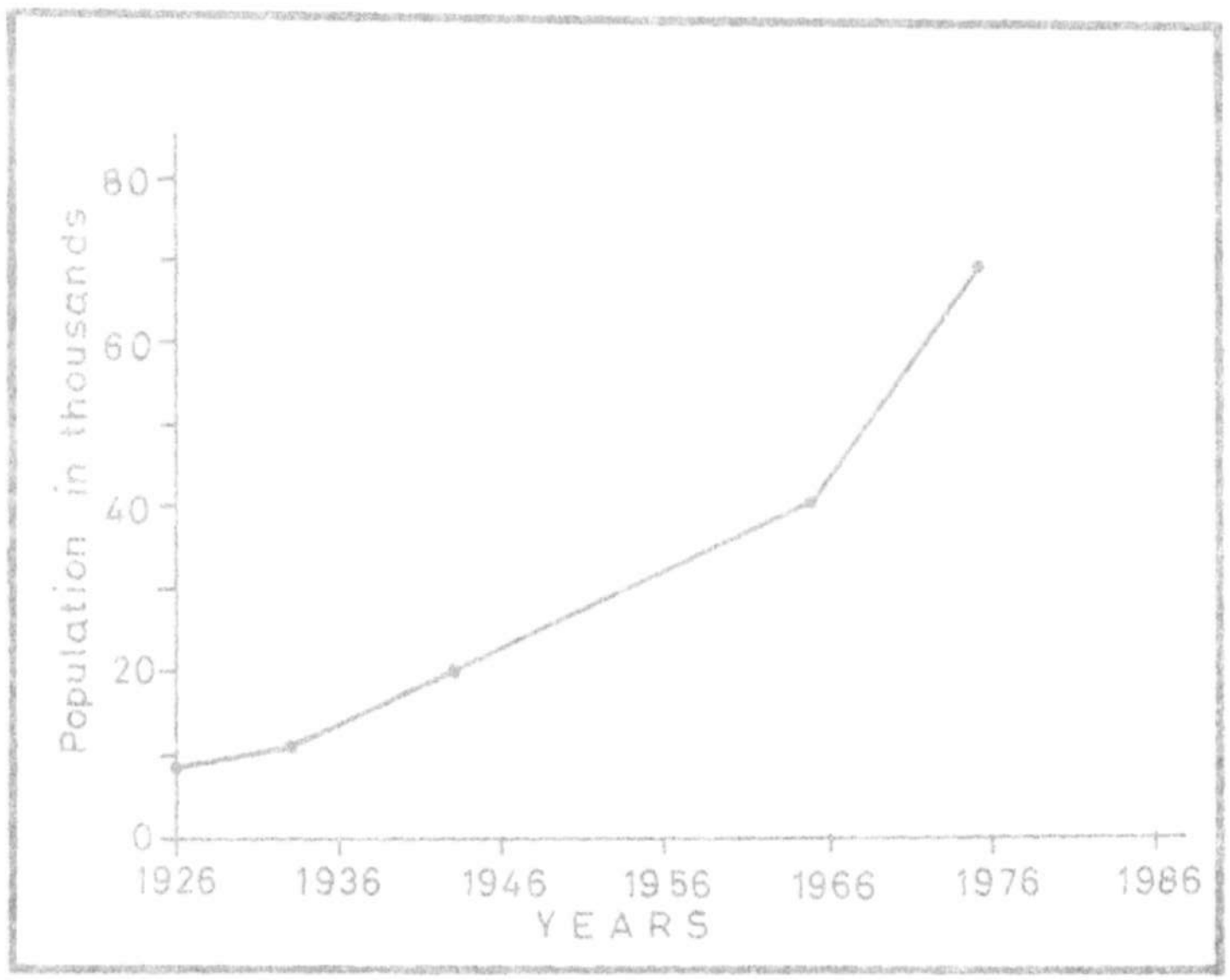


Fig 7; Gusau Graph of Population Growth 1914 -1963

growth in bank deposits can be illustrated. Between 1971 and 1976 total bank deposits have grown from ₦686,621.00 to ₦3,475,100.00, or a growth rate of 34 per cent. For the other two banks the picture is very much the same.

Table 5: Growth in bank deposits in one of Gusau's commercial banks - 1971-1976

Year	Demand Deposits	Time Deposits (₦)	Total Deposits (₦)	Annual growth rate
1971	586,300	100,321	686,621	23%
1972	701,436	142,379	843,815	23%
1973	808,833	197,276	1,006,108	18%
1974	711,287	399,974	1,111,261	12%
1975	1,225,006	683,808	1,908,818	70%
1976	2,689,697	785,403	3,475,100	82%

Source: Field survey, 1977.

Table 6: Power consumption in Gusau 1974-76

Year	Total units consumed	Average monthly units consumed	Annual growth rate
1974	6,546,696	545,558	
1975	8,829,203	735,767	20.7
1976	11,512,718	959,393	

Source: Filed survey, 1977.

Both power consumption and treated water consumption in Gusau also show the same rapid growth. Tables 6 and 7 show the figures for 1974 to 1976 for power and water consumption respectively.

Table 7: Growth of treated water consumption in Gusau, 1974-1976

Year	Annual consumption in gals	Average monthly consumption	Annual growth rate
1974	279,933,000	23,327,750	11.7%
1975	330,235,500	27,519,625	
1976	389,856,000	32,488,000	

Source: Field survey, 1977

Growth of Gusau: the spatial dimension

The spatial expansion of Gusau urban centre is best illustrated with a map. Fig. 10 shows the built-up areas of Gusau in 1950, 1961 and 1977.

In 1950 the built-up areas comprised, the oldest settled areas of Kanawuri, Birninruwa, Sabongari and Sabonpegi; the catering rest house area; parts of the zoned commercial areas across the railway line to the north, and that part of Tudun Wada south of the Gusau-Kaura Namoda main raod.

In 1961 Tudun Wada had grown northwards across the Gusau-Kaura Namoda road and eastwards along this main road. A mission hospital had been built some two kilometers along this road almost opposite the airport. Another area that saw some expansion during the period between 1950 and 1961 was the zoned commercial area across the railway line. Patches of built-up area could then be seen to the northern part of this commercial area. The industrial layout also had a new textile factory quite close to the ginnery. Along the Zaria road two important built-up

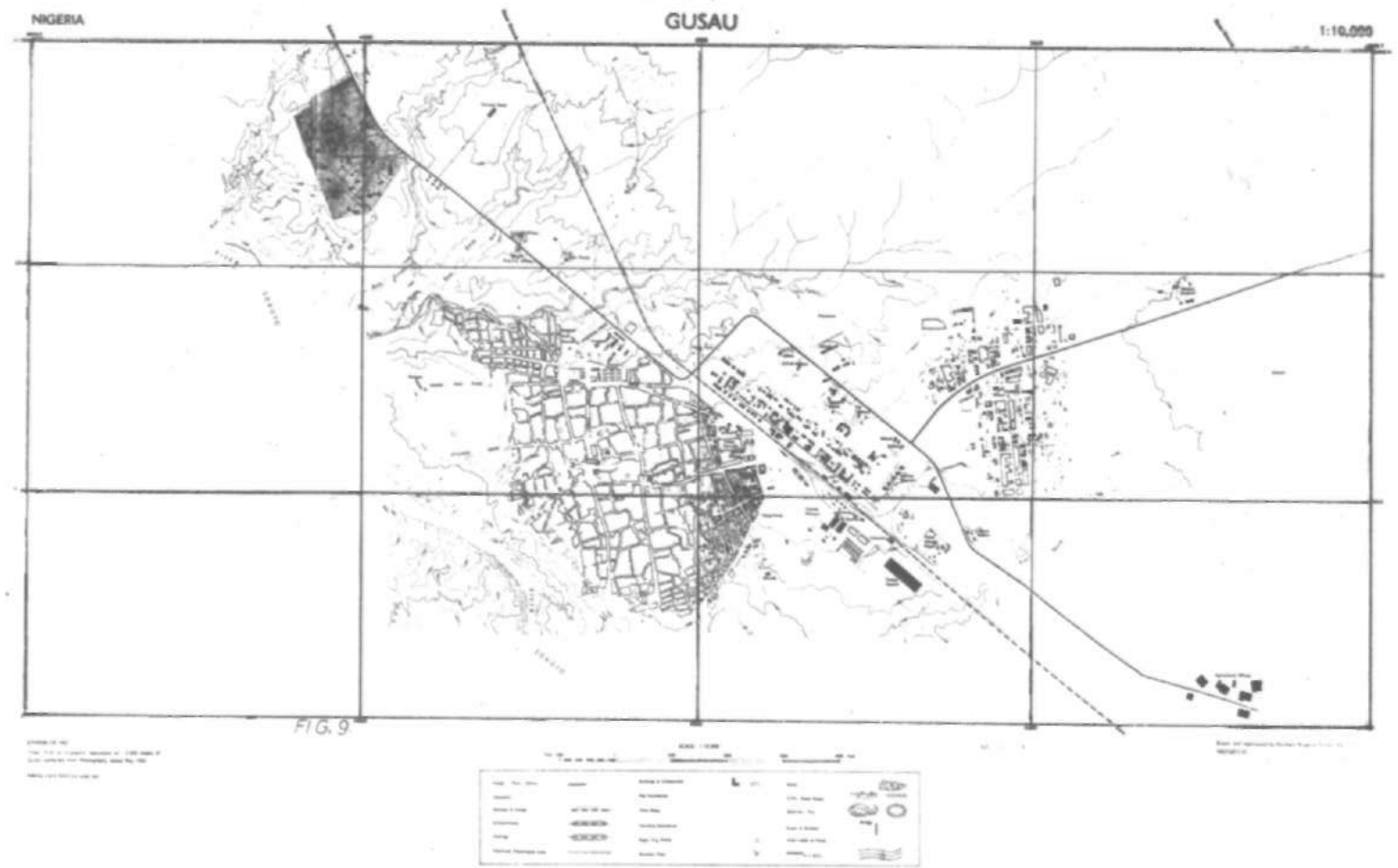


FIG. 9

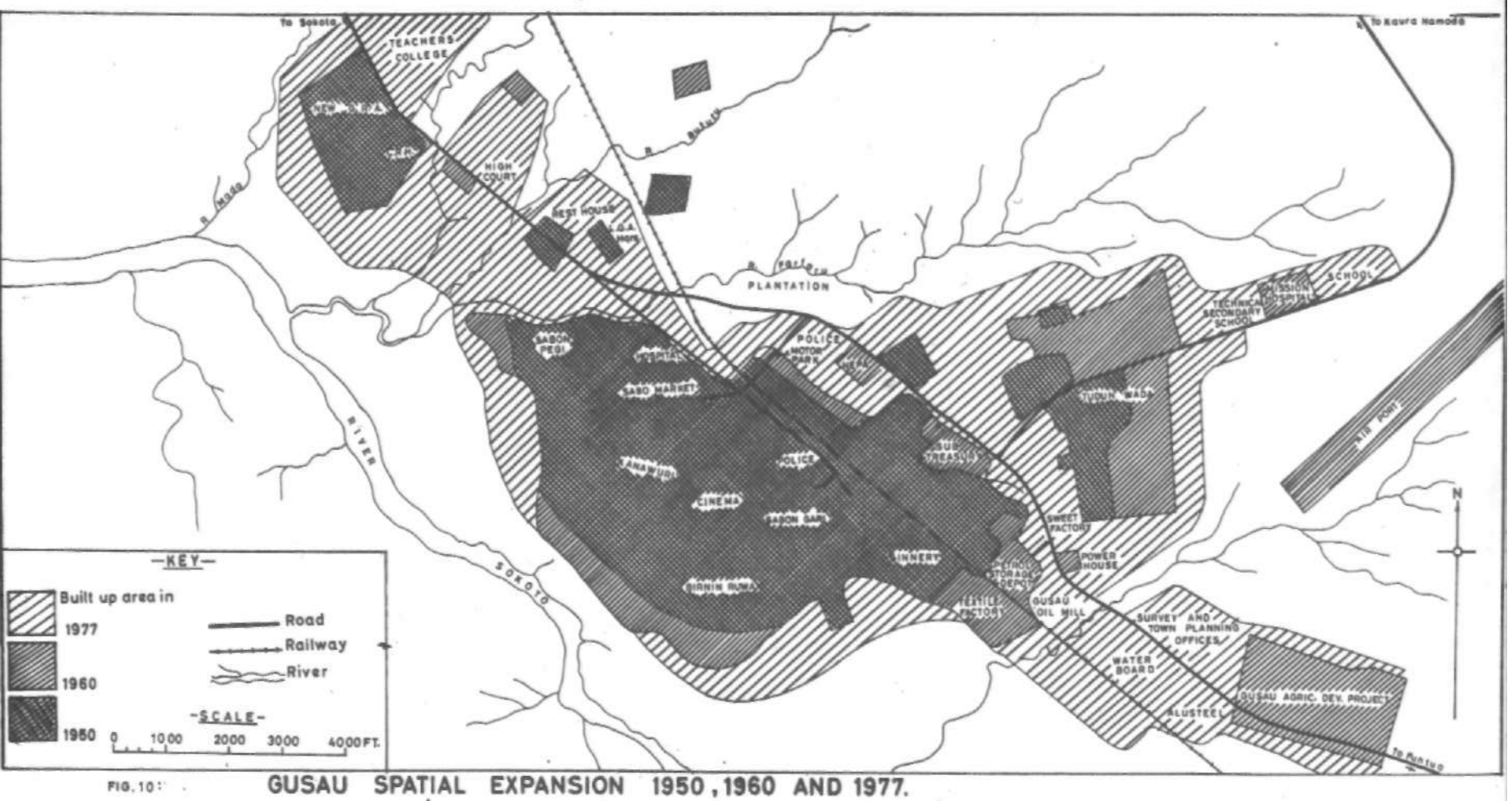


FIG. 10: GUSAU SPATIAL EXPANSION 1950, 1960 AND 1977.

areas could be noticed, namely Gusau power station and the Ministry of Agriculture premises at Samaru.

By 1977 most of the empty spaces between the various sectors of the town had been built up. The catering rest house area had expanded northwards and southwestwards to become the new Government residential area (GRA). Opposite the new G.R.A. on Sokoto road are two post primary schools. The empty space between the Rest House and Sabohpeggi has been completely built-up. Both sides of the Kaura Namoda road, from its junction with the Zaria-Sokoto road, up to some two kilometers outwards has now been completely built up. The industrial areas had also grown to include the present sites of Gusau sweet factory, Gusau oil mill and Alusteel factory. Both sides of Zaria road up to Samaru had now also been built up.

This spatial expansion reflects the internal population concentration in Gusau.

Growth of Gusau: the cumulative process

One important reason for the justification of growth centre policies is the notion that spatial agglomeration of production factors is a potent factor in stimulating rapid economic growth. Thus based on this notion Hirschman (1958) asserts that a regional economy "must and will first develop within itself one or several regional centres of economic strength" (p. 183). It is further argued that this spatial concentration of investment gives rise to a number of urbanization and transfer economies which tend to reinforce initial growth.

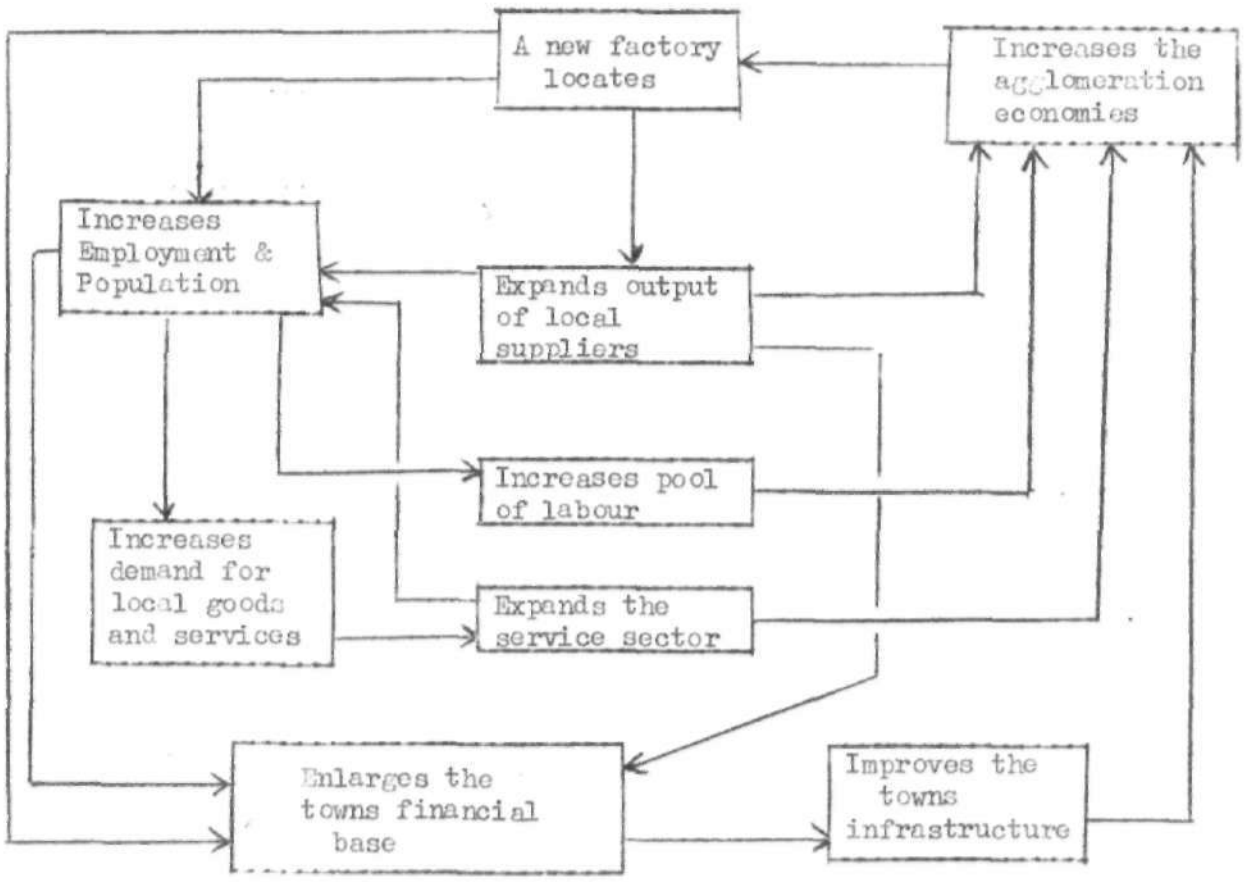
Urbanization economies relate to those economies arising from ease of access to municipal services such as water and electricity; technical education facilities, business services such as advertising, insurance and banking, and proximity to a large and varied labour force. Urban growth theorists now consider good access to these services and facilities as a driving force of rapid urban growth (Moseley 1974, p. 93).

Transfer economies "include all those savings which derive from proximity between firms buying and selling to one another, economies which relate to the cost both of transporting goods and materials and of communicating information" (Moseley, 1974, p. 96). Nearness to markets created through the spatial concentration of demand is thus considered to be an important advantage.

Besides these economies there are the localization economies, which arise from and to some extent stimulate, the establishment of similar firms. These individual agglomeration forces interact and reinforce one another in a cumulative causation process, (Myrdal, 1957, Pred 1966). The spatial concentration of economic growth in Gusau, sketched in the preceeding sections of this chapter, may thus be analysed and explained using this concept of cumulative causation.

A lot has been written on the cumulative nature of urban growth in the literature and only a summary account need be given. Fig. 11 is a diagramatic presentation of the cumulative and self-reinforcing nature of growth centre expansion. The basic argument is that, if a new propulsive firm is located in a town, an expansion of local

Fig. 11: The cumulative process of urban growth (after Keeble 1967 and Moseley 1974)



employment and population would follow. The job opportunities would attract in-migrants, both skilled and unskilled, to supplement the existing supply of labour. This concentration of population would increase demand for housing and for locally produced goods and services, thereby attracting service firms. Such firms would also create further employment opportunities and so greater population concentration. With the existence of this expanded and varied labour pool, labour-intensive production firms may be attracted to locate.

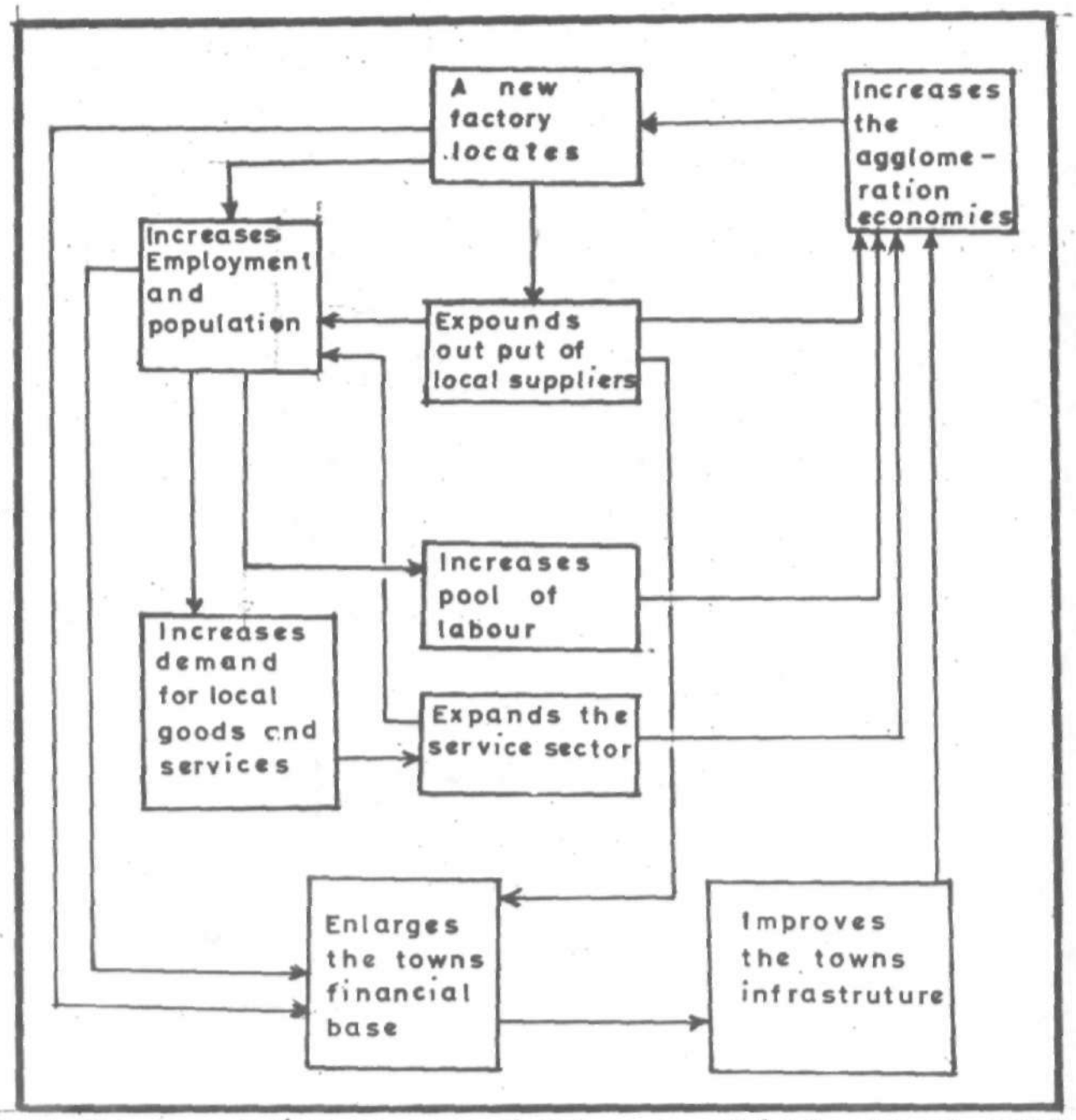


Fig.11 : The cumulative process of urban growth [After Keeble, 1967 and Moseley, 1974.]

Associated firms may also be attracted and vertical agglomeration follows as the urban area is chosen as a location by firms supplying equipment to the first industry or using its byproducts. This additional location of production firms would create further urban population growth, thereby enlarging the market.

"The multiplier effect associated with this influx of people and the appearance of linked firms enhances the likelihood of innovations and the technological advancement which follows promotes further the array of scale economies available in the centre" (Goodall, 1972, p. 270).

The addition of extra firms augments local income as the salaries and wages paid to industrial workers would create effective demand. Capital and enterprise are attracted to meet the expanding internal demand and the production of goods and services for immediate local consumption is expanded. The construction industry would also be attracted to provide urban housing.

The tax base of the community would be raised as urban income increases. This enlarged tax base would facilitate the improvement of municipal services and infrastructure. Thus urban growth feeds upon itself and may therefore be viewed as an interrelated process in which each stage in the development is a function of the previous stage (Pred, 1966). "This cumulative process would continue until diseconomies of scale set in after a certain threshold level" (Gama, 1977, p. 8).

The application of this concept of cumulative growth to the

expansion of Gusau is obvious. One major direct effect of the establishment of a new factory indicated by the diagram is the expansion of employment and hence of the town's population. The establishment of the British Cotton Growing Association's ginnery at Gusau in 1926 brought in "ginnery workers" to the town. While the population growth rate before 1926 was 1.7 per cent per annum, the rate after 1926 had increased to 3.6 per cent per annum. This increase in the rate of population growth can surely be attributed to the influx of people occasioned by the establishment of the ginnery and other economic activities created by it. When in 1965 Zamfara Textile Industries Ltd. established its factory in Gusau, many more workers were brought in. The high share of industrial workers and the positive absolute gain of industrial workers recorded for the town in 1969 was attributed to the establishment of this textile factory (Schatzl, 1972, p. 133).

Other indirect effects of the location of the ginnery at Gusau follow as a matter of course. Since the products of the ginnery in the colonial era was meant for export, Gusau had to be connected to other national centres and export outlets. Inter-regional routes were therefore developed. The railway was extended from Zaria to Kaura Namoda through Gusau in 1929. Zaria-Sokoto and Gusau-Kaura Namoda roads were further developed. These routes not only provided outlet for the products of the ginnery they also facilitated the collection of raw materials for the factory, since they pass through the main production areas of seed cotton in the region.

It has not been possible to illustrate the expansion of the tertiary sector with the field data available but we know that the ginnery brought in also certain commercial firms who acted as produce buying agents. The G.B. Olivant, John Holts, Gottschalk among others came in to help buy the seed cotton for the ginnery. The establishment of these firms meant more people whose salaries and wages go to expand the demand for local goods and services, and they bring Gusau to the threshold level where the provision of certain public utilities by government became feasible. Banks, Insurance Companies, urban power and water supply came in with the growth of Gusau.

Another direct effect of the establishment of the ginnery was the stimulation and/or the attraction of linked firms. The link between the ginnery and the textile factory in Gusau is very obvious. There is no doubt that the ginnery provided one attraction for the location of Zamfara Textile factory at Gusau since the ginnery's main product, cotton lint, is the raw material used in the textile factory. Gusau oil mill uses as one of its main raw materials a byproduct of the ginnery - cotton seed. About 10,000 tons of this byproduct (cotton seed) was used by the oil mill in 1977. Compared with this figure is the 775 tons of groundnuts which was used in 1977 by the mill. Cotton seed therefore appear to be the more important raw material used by the oil mill. The three factories - the ginnery, the textile factory and Gusau oil mill are in fact very closely located in space, a clear indication of their functional linkages.

The other newer factories while not having any direct economic linkages with the ginnery were located in Gusau as a result of the agglomeration economies which had accumulated in Gusau as a result of its growth. One such attraction is the existence of a large pool of skilled and semi-skilled labour. The Metal Construction Factory and the Muhammadiya Metal Factory could not have been established in Gusau if skilled welders and carpenters were not easily available in the town. All these new factories attracted more people. Each expansion stage meant an increase in the attractiveness of Gusau for further expansion.

The analysis above has shown Gusau to be growing rapidly. This rapid growth has also been shown to be self-reinforcing. Recalling therefore the definition of a growth centre adopted at the introduction to this chapter it is obvious that Gusau can be described as a growth centre.

Footnotes

3 This formula is adapted from Onyemelukwe (1977, p. 14). The same formula is used for all computations of annual growth rates used in this chapter.

4. 15.6% annual growth rate here is somehow misleading. The ₦3 million pumped in by the government of Sokoto State in 1976 was a prop, to save the firm from total colapse allegedly caused by mismanagement.

5. The formula now is

$$r = \left(\frac{\log P_1 - \log P_0}{t} - 1\right) \times 100$$

where r = annual rate of growth of Gusau population

P_1 = Urban population in the census year under consideration.

P_0 = Urban population in the previous census year

t = the inter-censal period.

CHAPTER THREE

SPATIAL DYNAMICS OF GROWTH CENTRE - GROWTH SPACE INTERACTIONS

A profoundly important aspect of growth centre model is its analysis of relationships between the growth centre and the surrounding region - "an analysis which, together with that of agglomeration economies, largely explains the wide acceptance of the model, by governments (and planners in both developed and developing countries) as a key concept in regional economic planning" (Harris, 1966, p. 577). This acceptance of the growth centre model clearly reflects the hope that economic prosperity generated in the growth centre will diffuse into the growth space. "Yet although the notion of extensive spatial impact lies at the heart of growth centre policy, and indeed figures frequently in definitions of growth centre concept, comparatively little empirical work has been undertaken on this subject" (Moseley, 1972, pp. 57 and 58). Thus very little is known especially in quantitative terms of the way in which a favourable economic impact is propergated from an urban growth centre to the surrounding territory.

The growth centre model depicts the transmission of economic prosperity as a resultant of the interaction of two sets of opposing forces - "Backwash" and "Spread" effects. "Backwash" forces "relate to the tendency of factors of production to be drawn from periphery to centre..... The more enterprising elements of the peripheral community are attracted by the supposed superior opportunities for labour or enterpreneurship in the centre..... Similarly, capital and raw materials are drawn to the centre to fuel latter's expanding

economy (Moseley, 1974, p. 16). In contrast, the forces of "spread" comprise those which promote a more even distribution of economic development. The relevant processes may be predominantly economic, social or political in nature. It is postulated that the economic processes of spread effects include (a) the creation of employment opportunities and hence the generation of income (b) the expansion of demand for industrial raw materials (c) the stimulation of food production in the growth space for the urban industrial workers and (d) the spread of productive innovations. In a model developed by Hansen and Tiebout (1963) the total effects through these economic processes have been categorized into 'direct, indirect and induced' impacts. According to the model

$$M_i = E_i + \sum_{j=i}^{n} E_{ij} + \sum_{k=i}^{m} E_{ik}$$

where M_i = Total employment generated by industry i

E_i = Employment "directly" created by industry i

E_{ij} = Employment "indirectly" created by the demands of sector i on sector j

E_{ik} = "Induced" employment created by the demands of the workers in sector i on the final demand sector k.

To transform this into a spatial model and make it applicable to our analysis of growth centre impact via employment we may consider i to comprise the various industrial establishments in the growth centre. We can then try to find out where the direct employees come

from; where the indirect employment in sector j is located; in other words, what is the source of materials and services purchased by the growth centre firms; and where the induced employment is. Some of these categories, namely "indirect" and "induced", may defy quantification given the paucity of data. As such other surrogate measure will be employed where relevant. It is important to mention here that this analysis is essentially a partial impact study focussing mainly on the impact of an industrial growth centre on the surrounding villages. Also in the examination of the indirect and induced effects only the first round of effects are considered.

In addition to these economic processes of spread effects this chapter will also examine the spatial diffusion of innovations from the growth centre to the growth space since development is essentially "an innovative process leading to the structural transformation of social systems" (Friedmann, 1973, p. 43).

All these processes will be examined with a view to determining their nature, scale and extent.

Impact via the labour market

As Table 8 illustrates about 40 per cent of the total labour employment comes from Gusau and its 'growth space'. Most of these - in fact about 96 per cent, however belong to the lowest category of workers, the labourer/causal workers type.[6]

Other areas which have benefited greatly from this direct employment in the growth centre include other regions of Sokoto State

Table 8: Origins of industrial employees in Gusau

Origin	Total staff		Comprising					
			Senior staff		Intermediate and Junior		Labourer/Casual workers	
	Absolute	%	Absolute	%	Absolute	%	Absolute	%
Gusau Region	775	39.1	10	12.1	23	6.9	722	47.6
Other parts of Sokoto State	497	25.7	2	2.4	85	25.4	410	27.0
Benue State	172	8.9	3	3.6	24	7.2	145	9.6
Kwara State	84	4.4	7	8.4	21	8.1	50	3.0
Kaduna State	69	3.6	3	3.6	10	3.0	56	3.7
Non-Nigerians	49	2.5	41	49.5	0	0	8	0.5
Imo State	47	2.4	4	4.8	26	7.8	17	1.1
Plateau State	37	1.9	3	3.6	16	4.8	18	1.2
Oyo State	37	1.9	1	1.2	21	6.3	15	1.0
Bendel State	32	1.7	2	2.4	12	3.6	18	1.2
Anambra State	31	1.6	0	0	29	8.6	2	0.1
Kano State	24	1.2	1	1.2	12	3.6	11	0.7
Ogun State	23	1.2	0	0	17	5.1	6	0.4
Niger State	22	1.1	3	3.6	6	1.8	13	0.9
Gongola State	19	1.0	2	2.4	7	2.1	10	0.7
Bauchi State	10	0.5	1	1.2	8	2.4	1	0.1
C/River State	8	0.4	0	0	5	1.5	3	0.2
Borno State	8	0.4	0	0	1	0.3	7	0.5
Ondo State	6	0.3	0	0	3	0.9	3	0.2
Rivers State	3	0.2	0	0	2	0.6	1	0.1
Total	1933	100	83	100	334	100	1516	100

Source: Field survey, 1977.

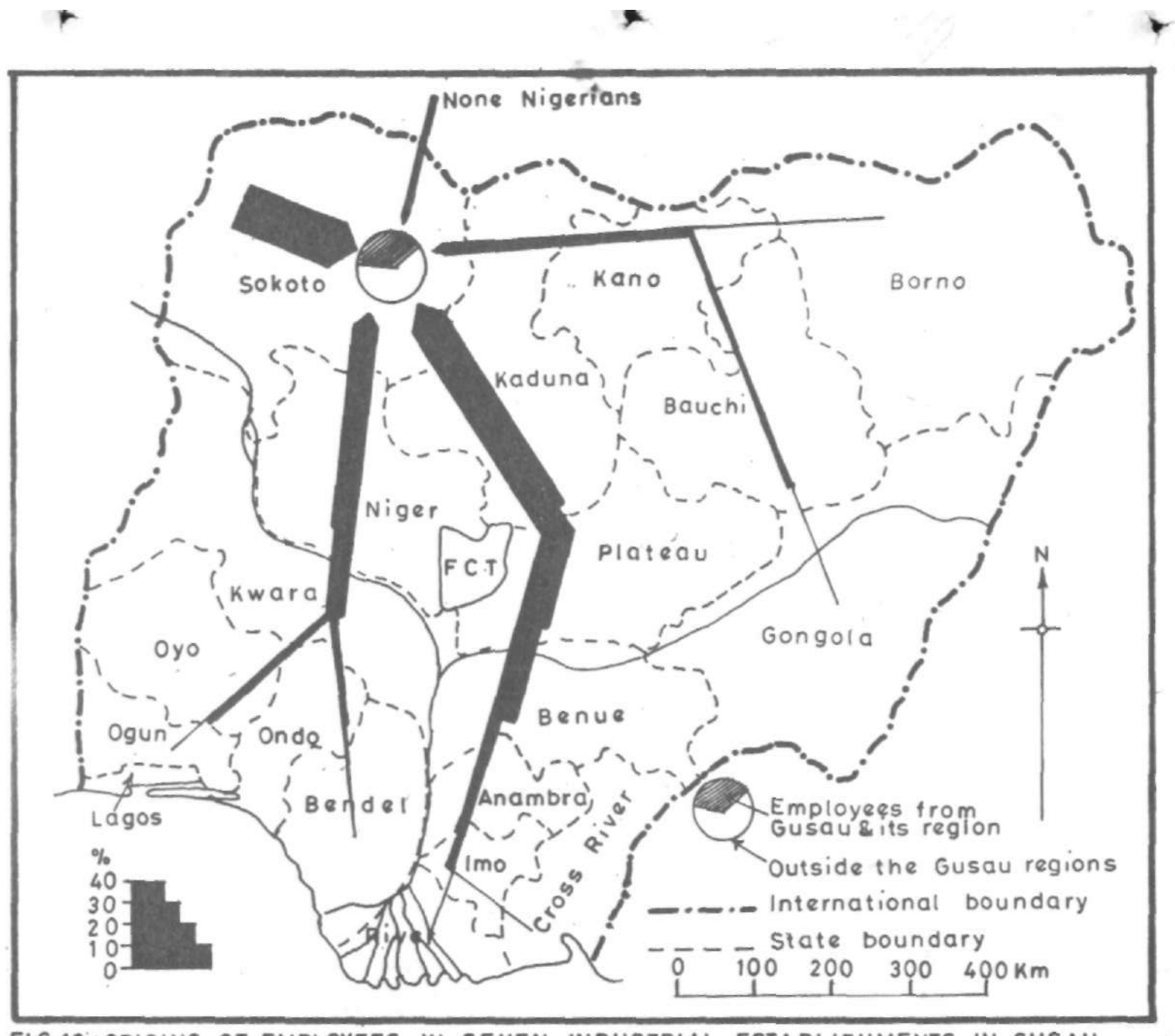


FIG.12 : ORIGINS OF EMPLOYEES IN SEVEN INDUSTRIAL ESTABLISHMENTS IN GUSAU 1977 BY STATE

(25.7 per cent), Benue State (8.9 per cent), Kwara State (4.4 per cent) and Kaduna State (3.6 per cent). The group called non-Nigerians comprise 41 nationals of China, India and Britain who form the top management cadre in Zamfara Textiles Industries Ltd., Gusau Oil Mills Ltd. and the Ginnery as well as the 3 security guards from Niger Republic in some of the establishments.

The spatial flow of labour directly employed in Gusau industrial establishments is shown in Fig. 12. It will be observed that the flows are thickest for Sokoto, Benue, Kwara and Kaduna States.

A survey of the origins of Gusau residents indicates that migrants from the surroudning villages of Gusau constitute only 5.4 per cent of the total sample population of 626, while those from the other regions of Sokoto State make up 34.2 per cent. 20.8 per cent of the sample population come from the other states of the country and beyond (Table 9).

Table 9: Gusau population by origin

Areas of origin	Absolute No.	% of total
Gusau town	248	39.6
Gusau region	34	5.4
Other regions of Sokoto State	214	34.2
Others	130	20.8
Total	626	100

Source: Field survey, 1977.

If we consider Gusau migrants alone (Table 10), again only 9 per cent come from Gusau region. Other regions of Sokoto State

have the lion's share of 56.6 per cent while 34.4 per cent come from other areas of the country and beyond.

Table 10: Origins of Gusau migrants

Origin	Absolute No.	% of total
Gusau Region	34	9.0
Other regions of Sokoto State	214	56.6
Others	130	34.4
All migrants	378	100

Source: Field survey, 1977

Table 11: Occupational distribution of Gusau residents

Occupation	Absolute No.	% of total
Commercial	197	31.4
Public Services (Govt.)	151	24.1
Farming and Fishing	106	17.0
Other services	74	11.8
Manufacturing	57	9.1
Transportation	27	4.3
Construction	14	2.3
Total	626	100

Source: Field survey, 1977

The occupational distribution of Gusau residents is given in Table 11 and illustrated with Fig. 13(a). 31.4 per cent of Gusau

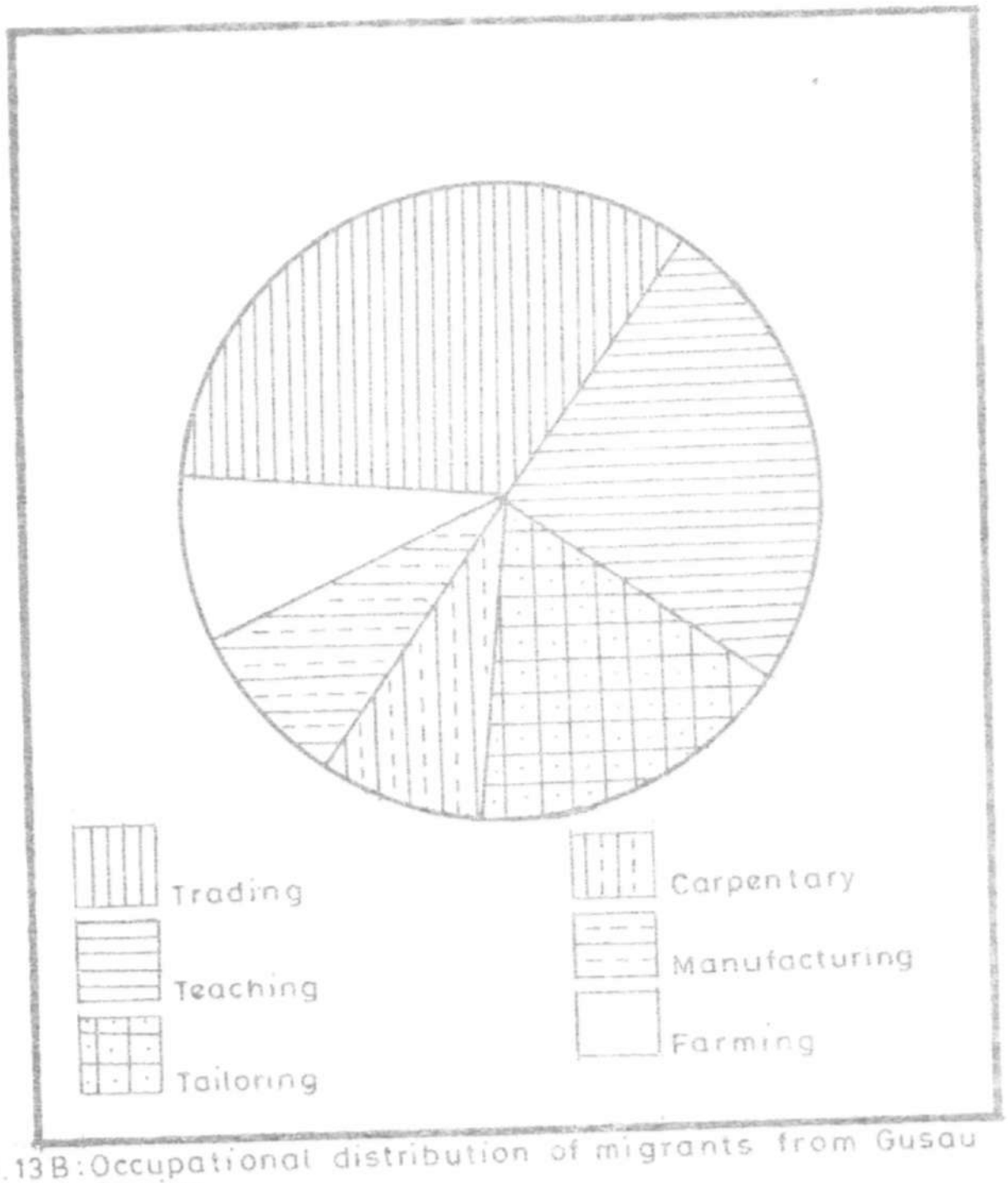


Fig. 13B: Occupational distribution of migrants from Gusau Region

residents are engaged in commercial activities, some 24 per cent work for the government, the primary production of farming and fishing occupy 17 per cent. The share of manufacturing of the working population in Gusau is 9 per cent and transport and construction take 4.3 and 2.3 per cent respectively.

Table 12: Occupational distribution of Gusau region migrants.

Occupation	Absolute No.	% of total
Trading	11	32.4
Teaching	8	23.5
Tailoring	5	14.5
Carpentry	4	12.0
Manufacturing	3	8.8
Farming	3	8.8
Total	34	100

Source: Field survey, 1977

The occupational distribution of migrants from Gusau region (Fig. 13b) reveals that the tertiary sector is the main attraction with trading more than 32 per cent of migrants, services such as tailoring and carpentry absorbs 26 per cent; teaching takes another 23 per cent while manufacturing and farming each take some 9 per cent.

Commuting is very negligible - amounting to only 0.9 per cent of the total industrial work force. The places of residence of commuters are limited to about six villages around Gusau, Jenyau,

Gidan Maharazu, Mareri, Aberma, Damba and Mahuta. Except for Damba all the villages lie within walking distance from Gusau. From the analysis above it can be seen that the Gusau region does not really benefit much from the generation of employment opportunities by the growth centre.

Impact through the purchase of raw materials

Of the seven industrial firms under consideration three can be said to greatly influence the demand for locally produced raw materials. The ginnery uses seed cotton and so directly influences the demand for locally produced seed cotton. The Oil Mill uses groundnuts and cotton seed. The Zamfara Textiles uses cotton lint, a product of the ginnery, and so it does influence the demand for locally produced cotton seed indirectly, Gusau Tannery uses sheep and goats skins as its main raw material but only five per cent of these come from the region. A breakdown of the sources of raw skins used by Gusau Tanning Company Limited (Table 13) shows Shinkafe area as the chief supplier providing about 50 per cent of the total raw skins used. Birnin Kebbi and Kaura Namoda areas follow with 35 and 10 per cent respectively.

The five per cent of this raw material coming from the Gusau region is a negligible figure. But even if it is not, it will be difficult to estimate from the quantities the labour force involved in the production of such quantities. The other firms, Gusau sweet factory and the two metal construction factories have about 100

Table 13: Sources of raw skins (sheep and goats) used by Gusau Tanning Company Limited in 1976

Source	% of total supplied
Shinkafe area	50
Birnin Kebbi area	35
Kaura Namoda area	10
Gusau Region (especially Nahuche)	5
Total	100

Source: Field survey, 1977

per cent of their raw materials imported from other regions so that any indirect employment generated by them through the purchase of materials constitute a leakage from the Gusau region.

Cotton and groundnut therefore are the two main industrial raw materials purchased by Gusau industrial firms, through the agency of the Marketing Boards.[7] A number of markets for the seasonal purchase of these materials are set up at various centres in the Gusau region.[8] For the season 1976/77 a total of 23,191 tonnes of seed cotton and 3,135 tonnes of groundnuts were bought from the various markets, (Tables 14 and 15, Figs. 14 and 15). The total number of tax payers for the study area is given as 14,500[9] and almost all of them are cotton and groundnut farmers. Using quantities produced as a surrogate measure of the labour employed in the production of such quantities, Table 16 shows the breakdown of the employment generated or maintained in the Gusau region through the purchase of materials by Gusau industrial firms.

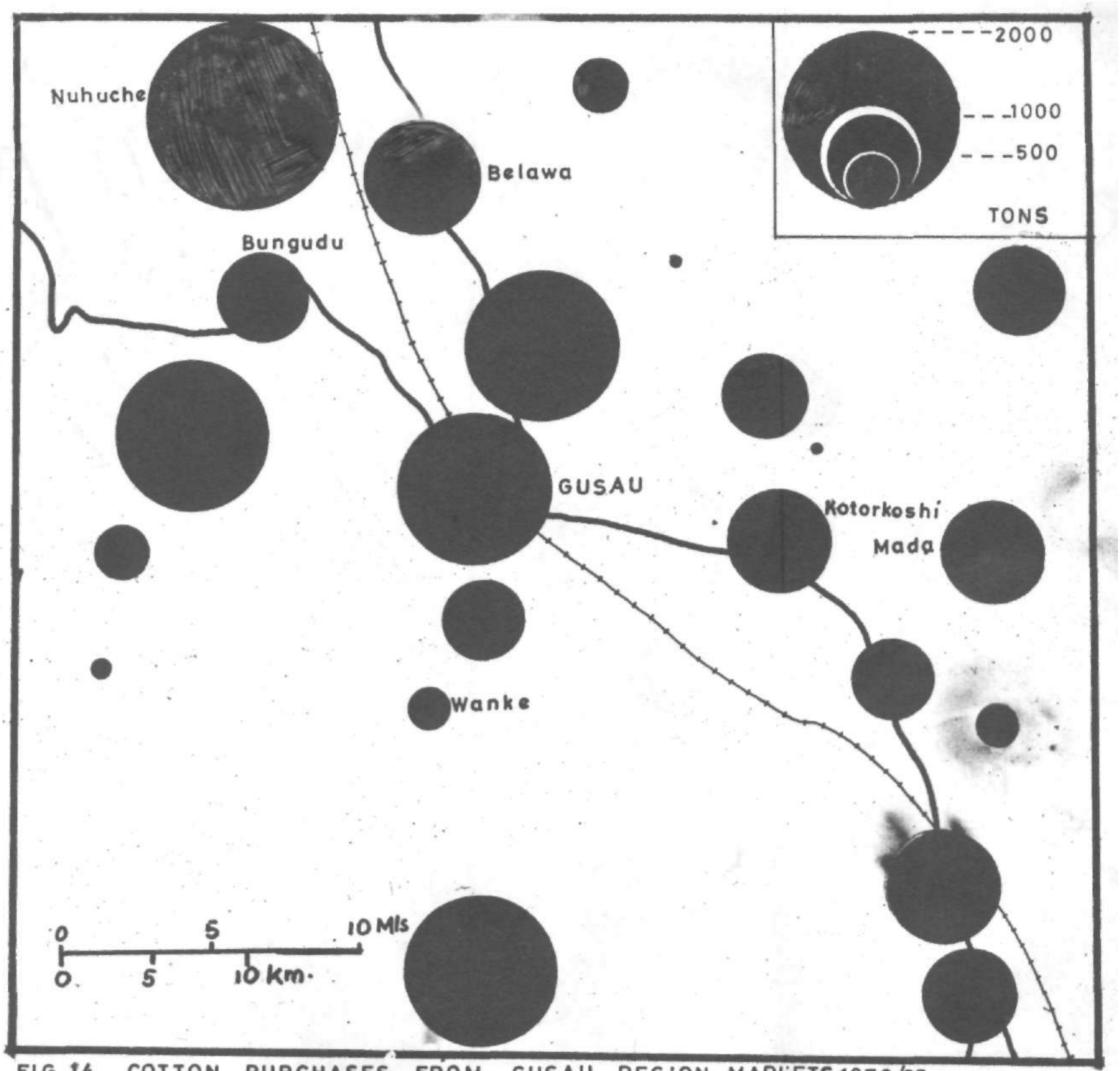


FIG 14 COTTON PURCHASES FROM GUSAU REGION MARKETS 1976/77

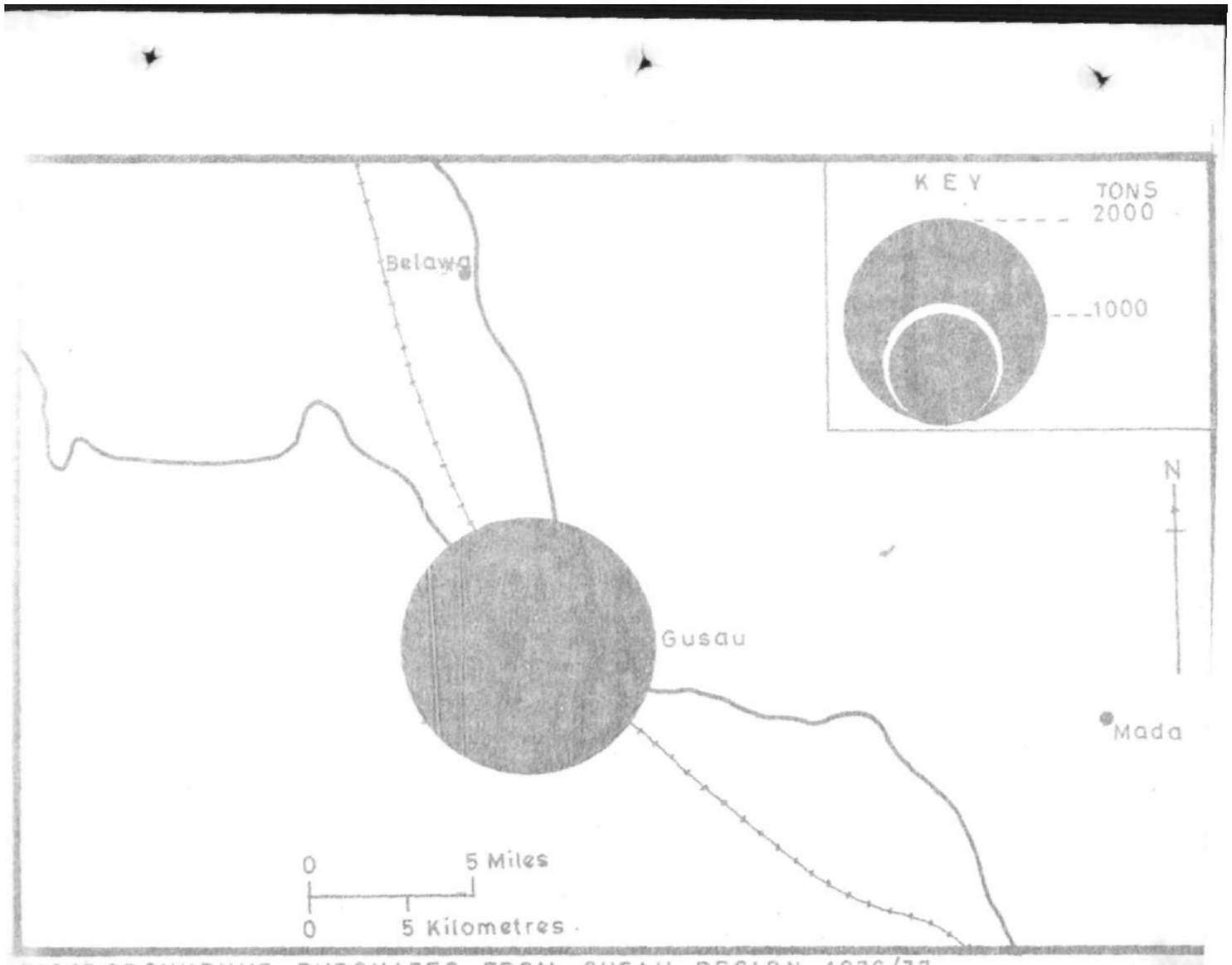


FIG.15:GROUNDNUT PURCHASES FROM GUSAU REGION 1976/77

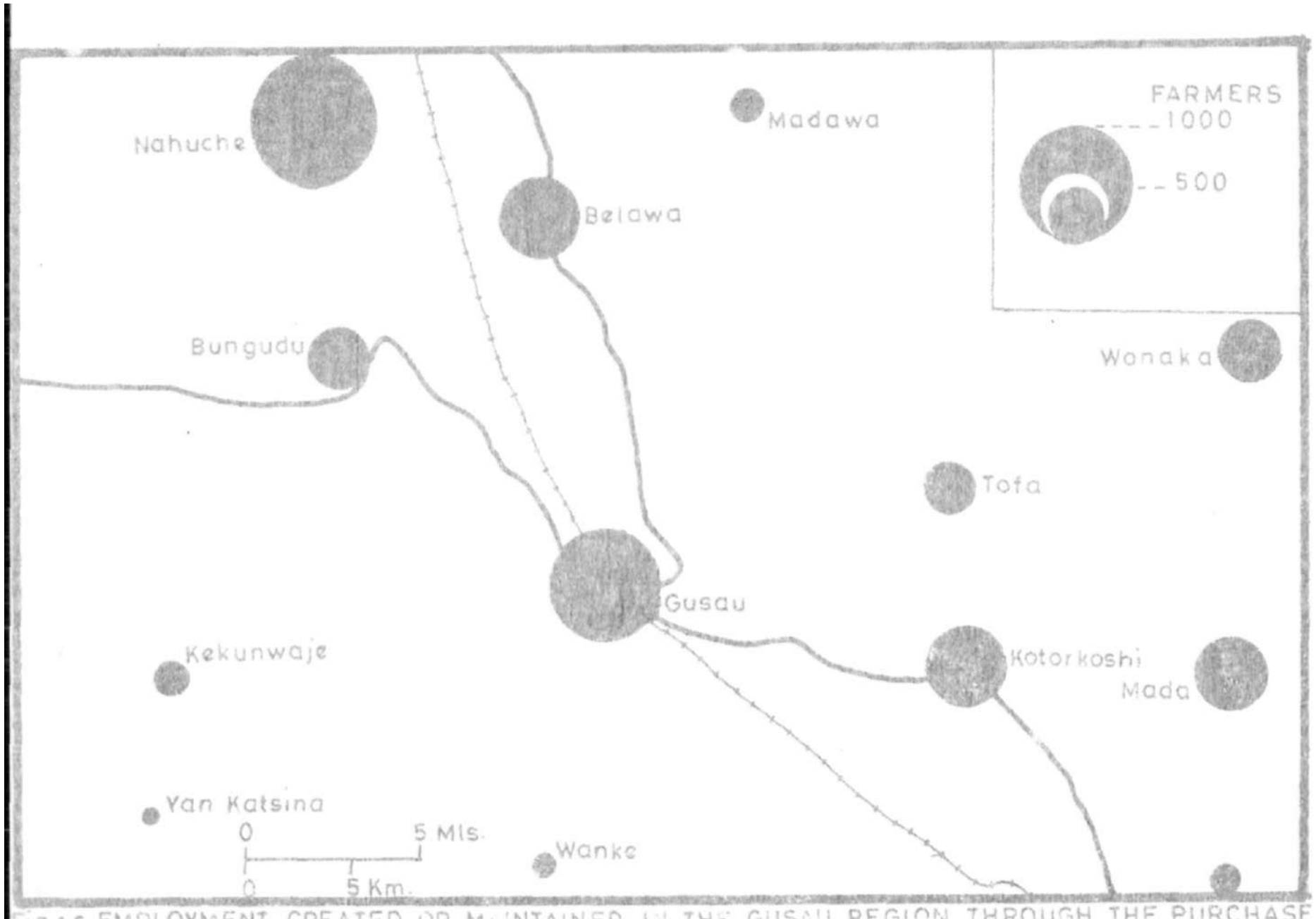


Fig-16 EMPLOYMENT CREATED OR MAINTAINED IN THE GUSAU REGION THROUGH THE PURCHASE OF COTTON BY GUSAU INDUSTRIAL GROUP

As Fig. 16 shows, proxinity to Gusau and the influence of accessibility are easily detected as the main factors which influence the spatial pattern of employment generated or maintained through the

Table 14: Gusau region: cotton markets and tonnages (1976/77 season)

Market	Tonnage	% of total
Mahuche	2096	9.0
Kuchin Kalgo	1779	7.7
Gusau	1752	7.6
Magami	1722	7.4
Kofa	1659	7.2
Chafe	1350	5.8
Belawa	1301	5.6
Kotokoshi	1273	5.5
Mada	1164	5.0
Bilbis	1058	4.6
Wonaka	1026	4.4
Bungudu	968	4.2
Yan Kuzo	878	3.8
Tofa	855	3.7
Yar Murin Daji	789	3.4
Kuran Kotar	681	2.9
Kekunwaje	534	2.3
Madaba	504	2.2
Chediya	445	1.9
R.T. Dawa	404	1.7
Manke	404	1.7
Yar Katsina	266	1.2
U. Gurki	139	0.6
Bawo	114	0.5
U. Mangane	30	0.1
Total	23.191	100

Source: Field survey, 1977

purchase of cotton by the firms. Other factors which help to explain the pattern shown in Fig. 16 are the population sizes of places and the activities of the Gusau Agricultural Development Project.

The ginnery purchased about 100,000 tonnes of seed cotton in the season 1976/77 and Gusau oil mill bought and used about 775 tonnes of groundnuts and 10,000 tonnes of cotton seed in the same season. This means that only 23.2 per cent of the seed cotton required by the factory is produced in the region. Some 76.8 per cent of this material had to come from other regions.

Table 15: Gusau region: groundnut markets and tonnages (1976/77 season)

Market	Tonnage	% of total
Gusau	2920	93.2
Mada	95	3.0
Beluwa	47	1.5
Kotorkoshi	35	1.1
Chafe	25	0.8
Magami	13	0.4
Total	3135	100

Source: Field survey, 1977

The employment generated through the purchase of raw materials by firms would include not just the producers but also the buying agents and transporters of such materials from the various markets

Table 16: Employment maintained in Gusau region through the purchase of materials by Gusau firms (1976/77 season)

Market	Cotton farmers
Nahuche	1186
Kunchin Kalgo	1106
Gusau	991
Magami	974
Kofa	938
Chafe	764
Belawa	736
Kotorkoshi	720
Mada	658
Bilbis	599
Wonaka	580
Bungudu	548
Yan Kuzo	497
Tofa	484
Yar Murin Daji	446
Kuran Motar	385
Kekunwaje	302
Madaba	285
Chediya	252
R.T. Dawa	229
Wanke	229
Yar Katsina	150
U. Sarki	79
Bawo	65
U. Wanzamo	17
Total	13,118

Market	Groundnut farmers
Gusau	1239
Mada	40
Belawa	20
Kotorkoshi	15
Chafe	11
Magami	6
Total	1331

Source: Field survey, 1977.

down to the factory. The magnitude of this category is difficult to quantify but it is important to realize that the marketing and transportation of these materials provide employment to hundreds of people every marketing season.

Another way by which the firms generate indirect employment is through the distribution of their finished products. Table 17 reveals that none of the firms has any distribution agent located in the Gusau region. Employment created or maintained through this channel accrue to the growth centre itself and other centres outside the Gusau region.

Induced employment emanates from income generated in the growth centre. A survey of the expenditure pattern of Gusau residents (Table 18 and Fig. 17) shows that 56.8 per cent of their monthly incomes is spent on growth centre goods and services. This would certainly produce induced employment in the growth centres. Induced employment is generated or maintained in the rural regions of Gusau through the expenditure of Gusau residents on local foodstuffs and firewood. This amounts to some 38.6 per cent of their monthly income.

A survey of places from where Gusau residents buy their local foodstuffs and firewood shows that about 98.9 per cent buy from Gusau market and only 1.1 per cent do go to the village markets to buy. The first round of induced employment emanating from this income expenditure includes therefore not only all the village

Table 17: Distribution Agents of Gusau industrial firms

Establishment	% product taken by agents in Gusau	% product taken by agents in the Gusau Region	% product taken by agents elsewhere
1. Cotton and Agricultural Processors Ltd. (Ginnery)	100	0	0
2. Zamfara Textile Industries Ltd.	0	0	100
3. Gusau Tanning Company Ltd.	0	0	100
4. Gusau Metal Construction Factory	100	0	0
5. Gusau Sweet Factory Ltd.	50	0	50
6. Gusau oil mill Ltd.	x	x	x
7. Muhammadiya Metal Factory Gusau	46.2	0	53.8

Source: Field survey, 1977.

Table 18: Expenditure pattern of monthly income by Gusau residents (1977)

Item	Non-migrants		Migrants		Total	
	Absolute (₦)	% of total	Absolute (₦)	% of total	Absolute (₦)	% of total
Total monthly income	24,296	100	41,363	100	65,659	100
1. Monthly income s spent on growth centre goods and services and/or saved	14,458	59.5	22,814	55.2	37,273	56.8
2. Monthly income spent on local foodstuffs	9,040	37.2	14,494	35.0	23,534	35.8
3. Monthly income spent on firewood	798	3.3	1,060	2.6	1,885	2.8
4. Monthly income sent home (remittances)	0	0	2,994	7.2	2,994	4.6

Source: Field survey, 1977

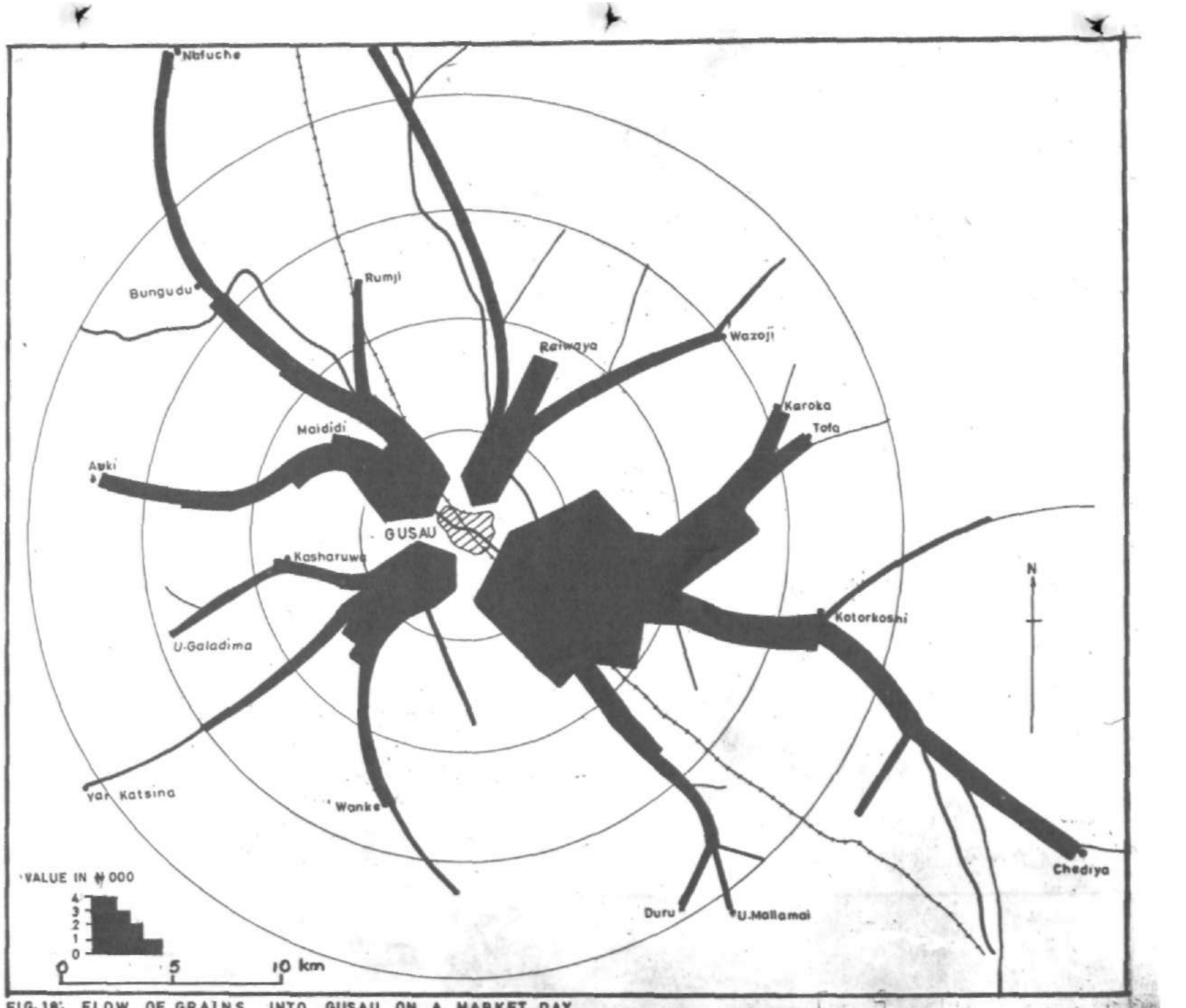


FIG-18: FLOW OF GRAINS INTO GUSAU ON A MARKET DAY

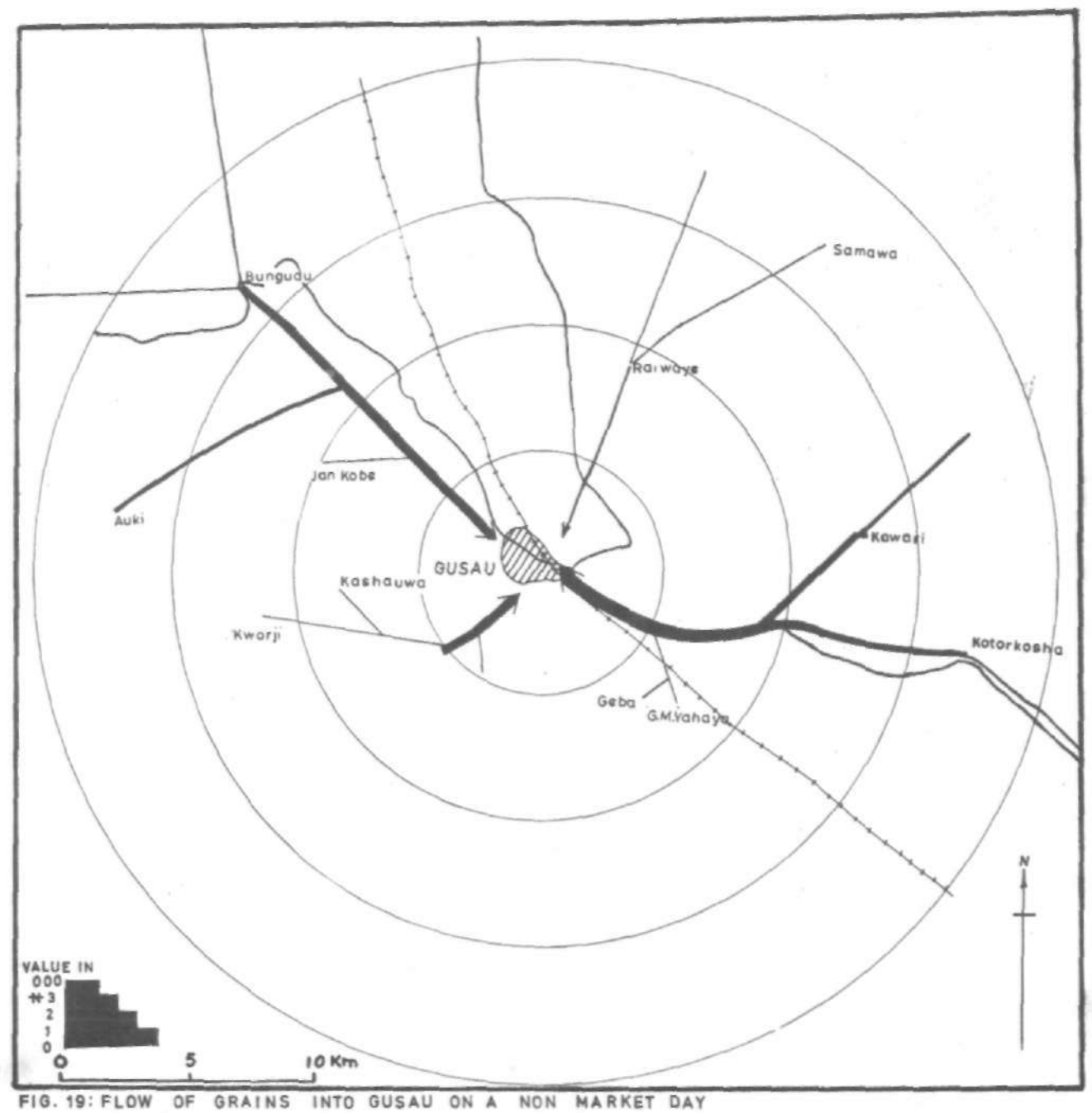


FIG. 19: FLOW OF GRAINS INTO GUSAU ON A NON MARKET DAY

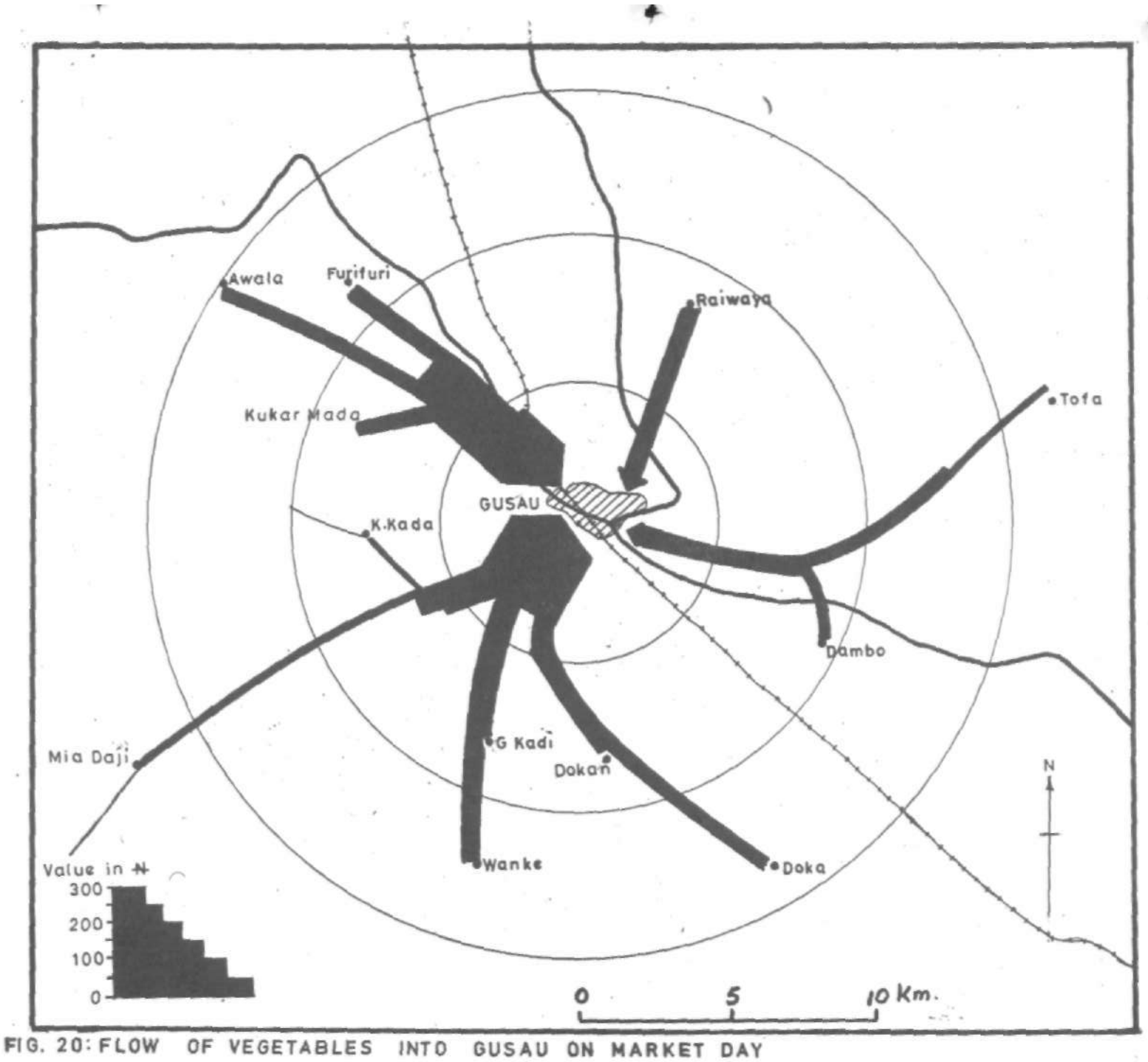


FIG. 20: FLOW OF VEGETABLES INTO GUSAU ON MARKET DAY

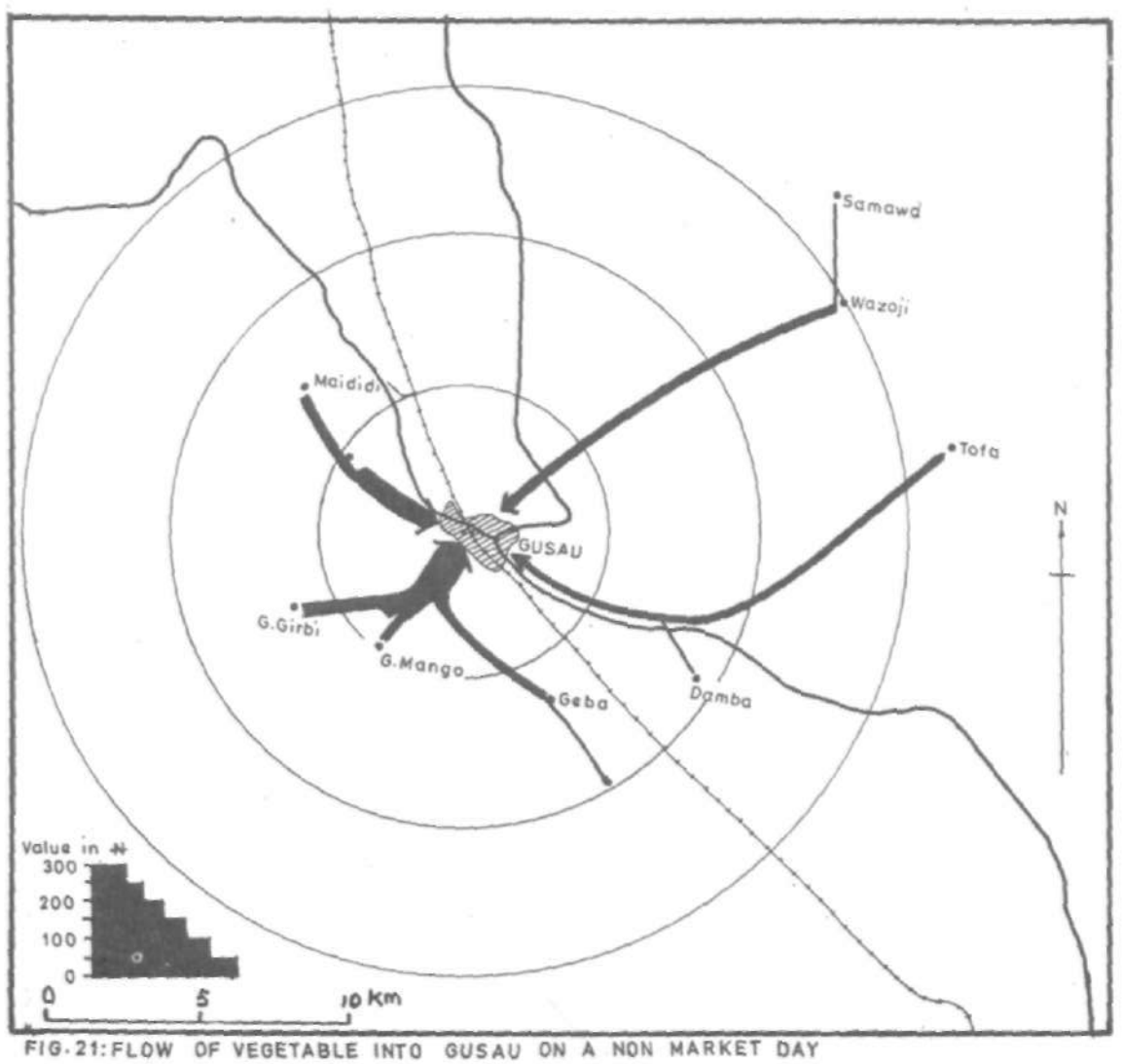


FIG. 21: FLOW OF VEGETABLE INTO GUSAU ON A NON MARKET DAY

farmers engaged in the production of such foodstuffs and firewood but also all the middlemen and transporters involved in the collection of such commodities to Gusau market. The spatial flows illustrated in Figs. 18, 19, 20 and 21 give some indication of places within the Gusau region which benefit most from such induced employment. Most of the grains that come into Gusau are produced within 30 kilometers of Gusau. The flow pattern indicates a distance decay, i.e. the greater the distance away from the growth centre the less the intensity of flow. The flow of vegetables into Gusau covers a radius of only 5 kilometers. Thus most of the induced employments are created within this radius.

The flow of income

The proponents of growth centre policy stress the fact that "the composition of urban industrial activities have income redistributive effects that go beyond the confines of a particular city" (Mabogunje, 1977, p. 10). Some of the mechanisms by which income is spread from the growth centre to the surrounding rural areas include (a) stimulation of food production in the growth space for the urban purchaser; (b) the expansion of demand for industrial raw materials, hence higher incomes for the producers of such materials; (c) the creation of employment opportunities and hence the generation of income some of which is remitted by the industrial workers to their home areas.[10]

"Direct" and "indirect" categorization can also be applied

in the examination of the processes outlined above for the spread of income from the growth centre to the surrounding villages. Direct income effects come through the salaries and wages paid to workers by the industrial establishments. Some of this income get remitted to the home villages. Other sources of direct income to the growth space come (a) through the purchase of industrial raw materials by the firms; and (b) through any other direct investments of the firms in the growth space. Indirect income effects emanates from the expenditure of income generated in the growth centre on locally produced foodstuffs and firewood.

The salaries, wages and other personal emoluments paid out to industrial workers in Gusau in 1976 by the seven factories under consideration amounted to some ₦2.2 million. This gives an average monthly figure of ₦181,337.00 (Table 19).

Table 19: Salaries, Wages and other personal enoluments of Gusau industrial workers (1976)

Industrial Establishments	Payment to workers in 1976 (₦)
1. Cotton and Agricultural Processors Ltd.	124,900
2. Zamfara Textile Industries Ltd.	1,417,900
3. Gusau Tanning Company Ltd.	56,820
4. Gusau Metal Construction Factory	27,252
5. Gusau Sweet Factory Ltd.	84,800
6. Gusau Oil Mills Ltd.	372,000
7. Muhammadiya Metal Factory Gusau	92,376
Total	2,176,048
Average monthly payments by all establishments	181,337

Source: Field survey, 1977.

Table 20: Structure of wages and salaries in the industrial sector of Gusau (1977)

Employment Category		Income relationship in factories														Average for the 7 factories	
		1*		3*		2*		4"		5.*		6*		7*			
		Av.per capita income ₦	R	Av.per capita income ₦	R	Av.per capita income ₦	R	Av.per capita income ₦	R	Av.per capita income ₦	R	Av.per capita income ₦	R	Av.per capita income ₦	R	Av.per capita income ₦	R
Senior Staff	Expa-triate	3700	11.2	8950	10.0	x	x	x	x	6000	12.0	12000	33.0	x	x	7665	15.5
	Nige-rians	3500	10.6	5400	6.0	6500	19.4	3600	7.9	2000	4.0	4000	11.1	3200	5.5	4029	8.1
Intermediate and Junior staff		1800	5.5	1980	2.2	1800	5.4	1800	4.0	720	1.4	1800	5.0	1800	3.1	1671	3.4
Labourer/Casual Workers (unskilled)		330	1	900	1	336	1	456	1	500	1	360	1	580	1	495	1

Source: Field survey, 1977.

* Numbers refer to factors.
R = Relationship

1. The ginnery
2. Zanfara Textiles
3. Gusau Tannery
4. Gusau Metal Construction Factory
5. Gusau Sweet Factory
6. Gusau Oil Mills
7. Muhammadiya Metal Factory Gusau

Table 20: Structure of wages and salaries in the industrial sector of Gusau (1977)

Employment Category		Income relationship in factories																Average for the 7 factories	
		1*		2*		3*		4*		5*		6*		7*					
		Av. per capita income ₦	R	Av. per capita income ₦	R	Av. per capita income ₦	R	Av. per capita income ₦	R	Av. per capita income ₦	R	Av. per capita income ₦	R	Av. per capita income ₦	R			Av. per capita income ₦	R
Senior Staff	Expatriate	3700	1.2	8950	10.0	x	x	x	x	6000	12.0	12000	33.0	x	x			7665	15.5
	Nigerians	3500	10.6	5400	6.0	6500	19.4	3600	7.9	2000	4.0	4000	11.1	3200	5.5			4029	8.1
Intermediate and Junior Staff		1800	5.5	1980	2.2	1800	5.4	1800	4.0	720	1.4	1800	5.0	1800	3.1			1671	3.4
Labourer/Casual workers (unskilled)		330	1	900	1	336	1	456	1	500	1	360	1	580	1			495	1

Source: Field survey, 1977.

* Numbers refer to factors. R = Relationship

1. The ginnery
2. Zanfara Textiles
3. Gusau Tannery
4. Gusau Metal Construction Factory
5. Gusau Sweet Factory
6. Gusau Oil Mills
7. Muhammadiya Metal Factory Gusau

Of the total monthly earnings of the workers in the seven factories given in Table 19, ₦108,007.00 go to migrant workers while the remaining ₦75,260.00 are paid to non-migrant workers. Based on an empirically derived propensity to remit money home of 7.2 per cent[11] for industrial workers in Gusau, an estimated amount of ₦7,782.00 is sent home by all migrant workers every month to their regions. But migrants from the growth space i.e. Gusau region, constitute only 9 per cent of all migrant workers (Table 10) and so only ₦700.00 is remitted every month to the various villages surrounding Gusau, while the remaining estimated figure of ₦7,082.00 is sent out every month to other regions. This figure of ₦700.00 is of course an optimistic estimation. Gusau region migrants belong to the lowest employment category - the labourer/causal workers type. The income relationships (Table 20) show very wide gaps between the categories. Therefore the propensity to remit money home of these Gusau region migrants is likely to be low - in fact lower than the 7.2 per cent used.

Purchase of raw materials, especially cotton and groundnuts by two of the firms injected some ₦8 million[12] into the Gusau region in 1977. Of this amount about ₦7.2 million came from the sale of seed cotton. The ginnery processed some 100,000 tons of seed cotton in 1977. If all had come from the Gusau region a revenue of about ₦30.8 million would have been realized from the sale of seed cotton alone. This means that the income of ₦7.2 million actually

realized from the sale of cotton represents only 23.2 per cent of the potential income of ₦30.8 million, had all the cotton processed in the ginnery come from the Gusau region. A great income opportunity therefore exists for the Gusau region if the production of cotton can be increased. Table 21 shows the distribution of this income to the various produce markets in the Gusau region. Areas that benefit most include Nahucho, Kunchin Kalgo, and Magami areas. The main factors influencing this spatial distribution of income from cotton sales are accessibility in terms of nearness to Gusau and the availability of roads and other transport facilities and the activities of Gusau Agricultural Development Project.

Virtually all the income derived from groundnuts sales accrues to those areas very close to Gusau - in fact not outside 10 kilometers radius of Gusau town. After the three successive years of drought (1972-74) and the additional two following years of bad harvest occasioned by crop disease the farmers are abandoning the crop in favour of cotton and other more reliable crops. Only areas with great proximity advantage to Gusau still continue to grow it.

From my field investigations there is no indication that the firms have any investments in the Gusau region. Even the purchase of raw materials from the region is done through the agency of marketing boards.

Table 21: Income created in Gusau region through the purchase of materials by Gusau firms (1976/77 season

Market	Cotton income (₦)
Nahuche	645,568
Kunchin Kalgo	547,932
Gusau	539,616
Magami	530,376
Kefa	510,972
Chafe	415,800
Belawa	403,480
Kotorkoshi	392,084
Mada	358,512
Bilbis	325,864
Monaka	316,008
Bungudu	298,144
Yan Kuso	270,424
Tofa	263,340
Yar Murin Daji	243,012
Kuran Kotar	209,748
Kokunwajo	164,472
Kadaba	155,232
Chediya	137,060
R.T. Dawa	124,432
Wanko	124,432
Yar Katsina	81,928
U. Sarki	42,812
Bawo	35,112
U. Wanzame	9,240
Total	7,145,610

Market	Groundnut income (₦)
Gusau	730,00
Mada	23,750
Belawa	11,750
Kotorkoshi	8,750
Chafe	6,258
Magami	3,250
Total	783,750

Source: Field survey, 1977

Income effect through the purchase of local foodstuffs and firewood

Income from expenditure on local foodstuffs and firewood - some 38.6 per cent of total monthly earnings of workers in the growth centre - mainly accrue to the rural regions of the growth centre even though hundreds of middlemen and transporters, mostly urban dwellers do share from this income. Tables 22-25 reveal that this source of income can be very substantial and so constitutes an effective mechanism for the spread of development to the surrounding villages. The computed value of commodity flows into Gusau on a market day amounted to about ₦92,058,00,[13] On a non-market day the figure is about ₦13,535,00,[14] The value of commodities flowing out of Gusau on these days amounted to ₦6,645,00[15] and ₦1,431,00[16] respectively. Averages for the two days for the in-flow and out-flow of commodities are ₦52,797,00 and ₦4,038,00 respectively. A comparison of the above figures indicates that there is definitely a favourable balance of income which could be used for the development of the rural regions around Gusau. But this surplus may not be ploughed back into productive investment as hoarding and wasteful spending could well be the case. Moreover, Tables 22-25 may not have presented the whole picture as most of the purchases of growth centre goods are made in the villages themselves - the goods being taken to the village markets by itinerant traders. The purchase of agricultural inputs by the farmers could not be adequately covered by the two days count as most of the villagers

Table 22: Value (in ₦) of commodity flows into Gusau on a market day

Counting Point	Grains		Livestock		Vegetables		Firewood		Total	
	Absolute	% of total	Absolute	% of total	Absolute	% of total	Absolute	% of total	Absolute	% of total
1	1271	3.8	990	1.7	56	10.7	44	5.1	2361	2.6
2	2725	8.2	3347	5.9	88	16.8	147	17.0	6305	6.8
3	1742	5.8	362	0.6	124	23.6	109	12.6	2337	2.5
4	11,780	35.2	15,629	27.3	33	6.3	445	51.3	27887	30.3
5	2341	7.0	4463	7.8	0	0	28	3.2	6832	7.4
6	4023	12.0	2843	5.0	46	8.8	0	0	6912	7.5
7	5219	15.6	13324	23.3	16	3.0	94	10.8	18653	20.3
8.	2149	6.4	12012	21.0	162	30.8	0	0	14323	15.6
9	2198	6.6	4250	7.4	0	0	0	0	6448	7.0
Total	33446	100.0	57,220	100.0	525	100.0	867	100.0	92,058	100.0

Source: Field survey, 1977

Table 23: Value (in ₦) of commodity flows into Gusau on a non-market day

Counting Point	Grains		Livestock		Vegetables		Firewood		Total	
	Absolute	% of total	Absolute	% of total	Absolute	% of total	Absolute	% of total	Absolute	% of total
1	21	1.0	0	0	0	0	16	5.1	37	0.3
2	948	46.0	172	1.6	62	40.5	108	34.5	1290	9.5
3	350	17.0	141	1.3	0	0	134	42.8	625	4.6
4	171	8.3	473	4.3	25	16.3	46	14.7	715	5.3
5	0	0	67	0.6	2	1.3	9	2.9	78	0.6
6	224	10.9	432	3.9	22	14.4	0	0	670	5.0
7	280	3.6	349	3.2	0	0	0	0	629	4.6
8	4	0.2	9375	85.1	42	27.5	0	0	9421	69.6
9	62	3.0	0	0	0	0	0	0	62	0.5
Total	2060	100.0	11009	100.0	153	100.0	313	100.0	13535	100.0

Source: Field survey, 1977.

Table 24: Value (in ₹) of commodity flow out of Gusau on a market day

Counting Point	Household goods		Foods, drinks & cigs		Farm tools and machinery		Building materials		Total	
	Absolute	% of total	Absolute	% of total	Absolute	% of total	Absolute	% of total	Absolute	% of total
1	29	1.0	40	2.1	30	1.9	0	0	99	1.5
2	193	6.7	7	0.4	0	0	0	0	200	3.0
3	271	9.5	612	32.2	145	9.1	31	11.0	1059	15.9
4	594	20.7	154	8.1	85	5.3	3	1.0	836	12.6
5	227	7.9	104	5.5	606	37.9	86	30.4	1023	15.4
6	76	2.7	385	20.2	111	6.9	128	45.2	700	10.5
7	649	22.7	251	13.2	599	37.5	0	0	1499	22.6
8	825	28.8	340	17.9	22	1.4	35	12.4	1222	18.4
9	0	0	7	0.4	0	0	0	0	7	0.1
	2864	100.0	1900	100.0	1598	100.0	283	100.0	6645	100.0

Source: Field survey, 1977

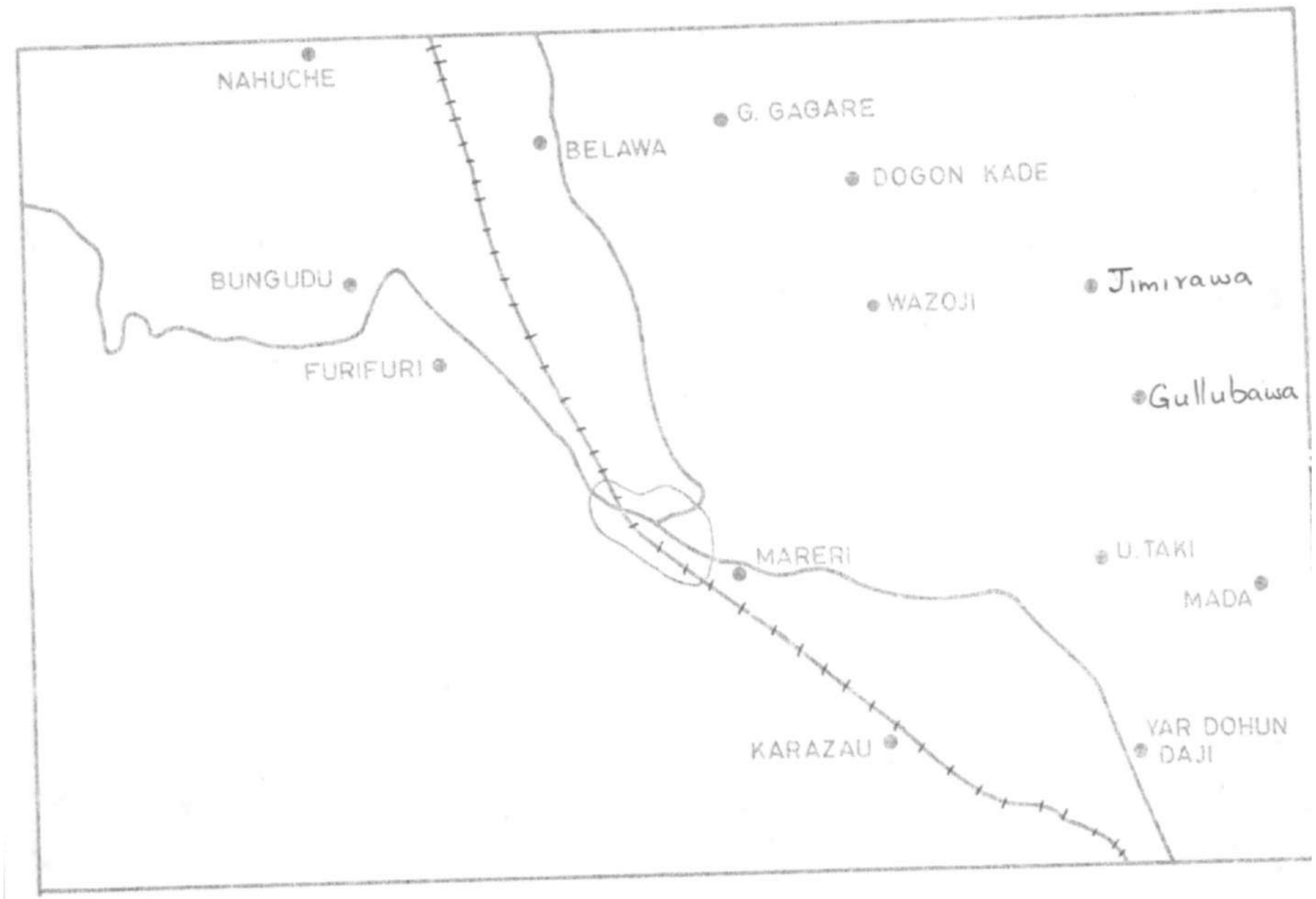


FIG. 22: GUSAU AGRICULTURAL DEVELOPMENT PROJECT SERVICE CENTRES IN GUSAU REGION

obtain these inputs from the various service centres set up in the region by the Gusau Agricultural Development Project (Fig. 22).

The spatial patterns of the flow of grains and vegetables on a market day and on a non-market day are shown in Figures 18 to 21. All the maps indicate a distance decay pattern but while the radius of effective flow of vegetables is small - about 5 kilometers that of grains is much wider - about 30 kilometers. Commodity flows have wider radius for both grains and vegetables on a market day than on a non-market day. The value of all the grains that come into Gusau on a market day amounts to ₦33,446.00. For the non-market day the figure is ₦2,060.00, more than 16 times smaller than that of a market day. This ratio is much smaller for vegetables, about 3.4 times smaller.

Diffusion of innovations

The concept of development relates not just to a process of quantitative expansion but also to one of qualitative change. Friedmann (1969) refers to development as "an innovative process leading to the structural transformation of social systems" (p. 4) and in the opinion of Hermansen (1972) "the process of development ..... can be conveniently described as the introduction and diffusion of successive waves of innovations in functional... and geographic space (p. 6). If therefore, as Berry argues, "the role played by growth centres in regional development is a particular case of the general process of innovation diffusion" (1972, p. 108),

it can be hoped that the theory of innovation diffusion will permit a better understanding of the likelihood and timing of a peripheral residents behavioural change in a way which may be construed as development. In our analysis of the diffusion of certain selected innovations, if proximity or access to the growth centre emerges as an important determinant of such change then the spatial impact of the latter is proven. In this analysis we are mainly concerned with diffusion over space, an area where geographers have made immense contribution. A distinction between two kinds of spatial diffusion - "neighbourhood" and "hierarchical" has been made. Cohen expresses this distinction as follows: "The neighbourhood effect means that ..... the closer a potential adoption unit to the source of innovation or to another unit that has already adopted..... the greater the probability that it will adopt.... The hierarchical effect implies that..... the higher the ranking of a potential adoption unit in a hierarchy, the greater the chance that it will adopt....." (Cohen, 1972, pp.14-15). Hagerstrand (1953) emphasized the neighbourhood effect. His basic idea is that innovation adoption spreads like a ripple on water. Thus waves of diffusion move from the growth centre outwards.

The adoption of zinc sheets and cement as building materials constitutes an important innovation spread from the growth centre to its surrounding rural regions because of the superiority of these building materials over their traditional counterpart. For each

sample village a count was made of the number of houses in which these modern building materials were used. This number was then expressed as a proportion per hundred persons and mapped. The pattern which emerges (Fig. 24) shows a strong indication of distance decay from the growth centre i.e. the further away you go from Gusau the smaller is this proportion. Both 'neighbourhood' and 'hierarchical' effects are indicated, though Nahucho and Belawa seem to exhibit greater cultural resistance to this innovation than most other villages. Hierarchical diffusion effects would suggest their having greater share of this innovation than they actually have.

From the number of retail shops per hundred persons (Fig. 25) a different pattern emerges. The proportions grow larger as one moves away from Gusau. This pattern seems to suggest the influence of competition from Gusau shops. Quite close to the growth centre there is hardly any retail shops established as the villagers can obtain all their needs directly from the shops in Gusau. But with greater distance away this competition grows less and the number of retail shops per hundred persons increases.

If we accept the role of migrants into rural areas as innovation bearers then the number of such migrants in the rural society can be used as an index of innovation adoption. Fig. 26 shows the percentage non-native population for the Gusau region. Again there is clear evidence of distance decay from the growth center. Fig. 32 also illustrates this. Another factor whose influence is clearly noticeable from the pattern is the transport route system. Belawa,

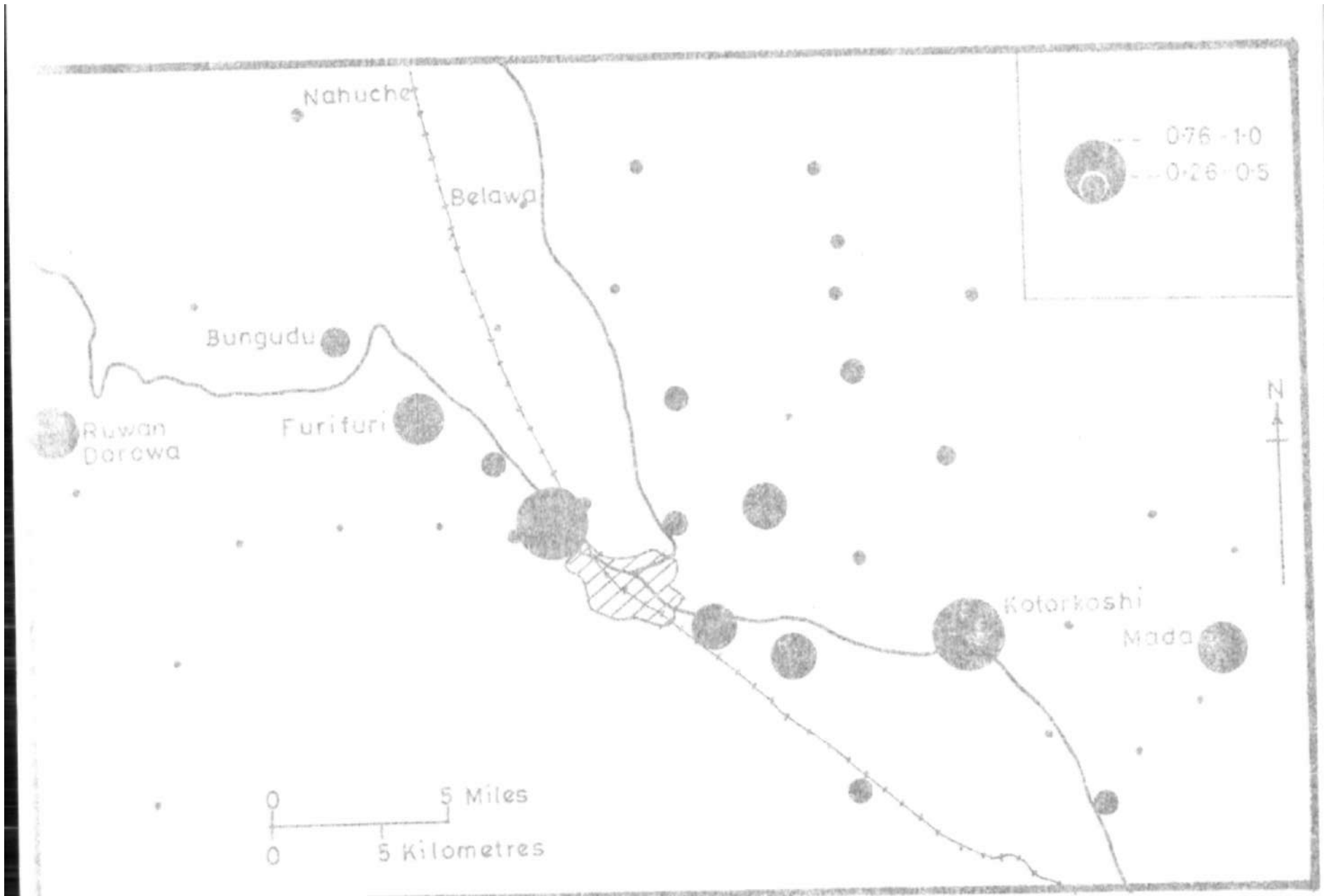


FIG 6.24 NUMBER OF ZINC/CEMENT HOUSE PER 100 PERSON IN GUSAU REGION

Yar Dotun Daji and Karazau are good examples of where the influence of accessibility is shown. Raiwaya, Dogon Kade and Mada have large shares of migrants because of their status in the hierarchy.

The diffusion of fertilizers and tractor hiring services are shown in Figs. 27 and 28. The use of fertilizer (takin zamani) is very widespread in the Gusau region and adoption seem almost to be complete. Neither the neighbourhood effect nor the hierarchical diffusion pattern is evident in this case. What is suggested is perhaps the activities of Gusau Agricultural Development Project in spreading this input. The pattern that emerged may have reflected the government's "Operation-Feed-the Nation" efforts which had the effect of spreading cheap and subsidized fertilizers to rural farmers all over the country. Tractor hiring services are limited to areas which are highly accessible. Thus places across the river Sokoto, south west of Gusau are excluded. So also are remoter areas to the north east of Gusau. All the areas where there are tractor-hiring services, are on either major roads or on newly constructed 'project' roads (Fig. 28). The main factors therefore influencing the availability of tractor hiring services are the existence of good roads and the activities of Gusau Agricultural Development Project.

The spatial pattern of motorcycle ownership in Gusau region, shown in Fig. 29, reflects rural wealth as well as the hierarchical status of settlements.[17] Areas very close to Gusau have smaller proportion of motorcycles. Perhaps the friction of



FIG. 27 GUSAU REGION DIFFUSION OF FERTILIZER

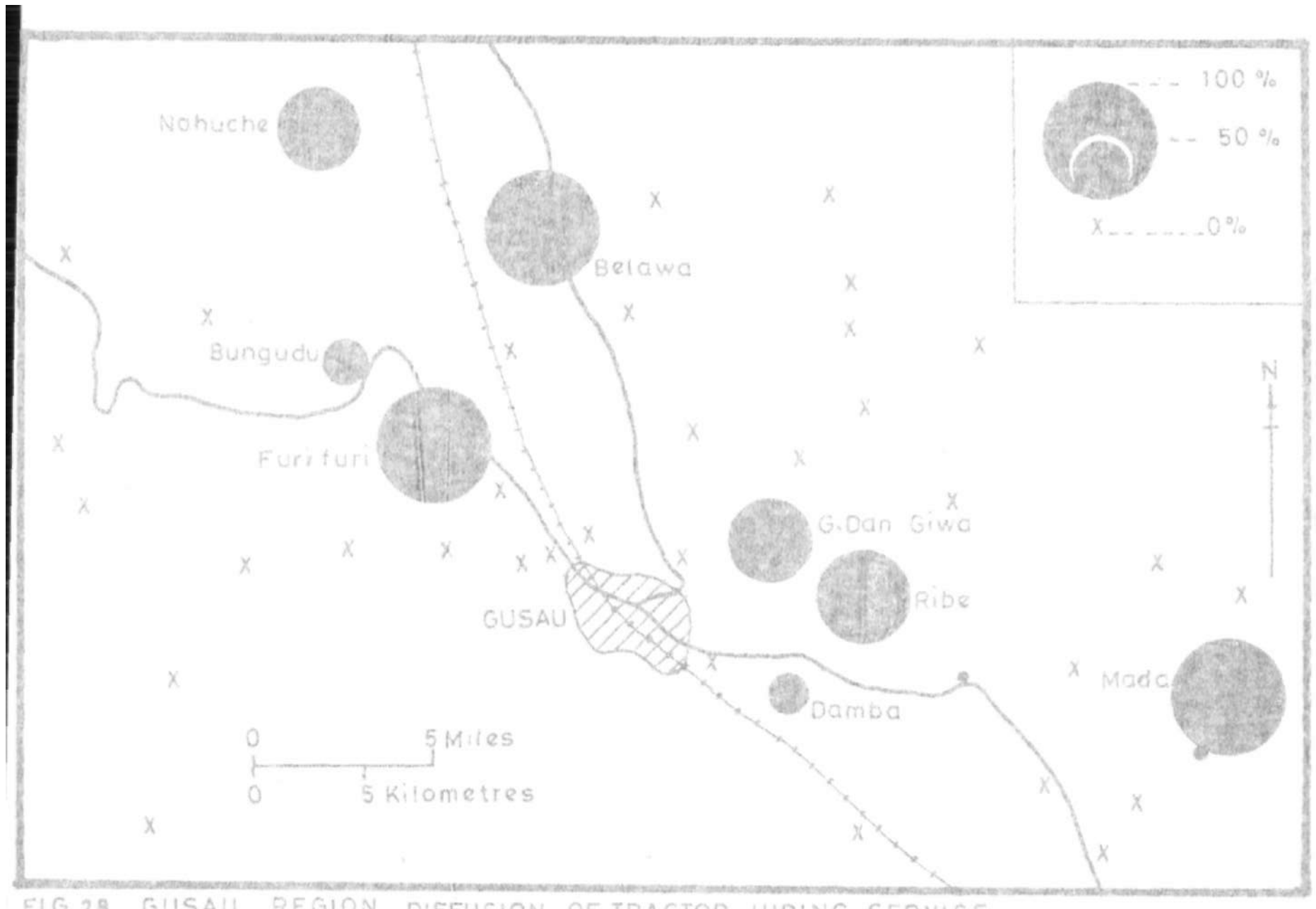


FIG. 28, GUSAU REGION DIFFUSION OF TRACTOR HIRING SERVICE

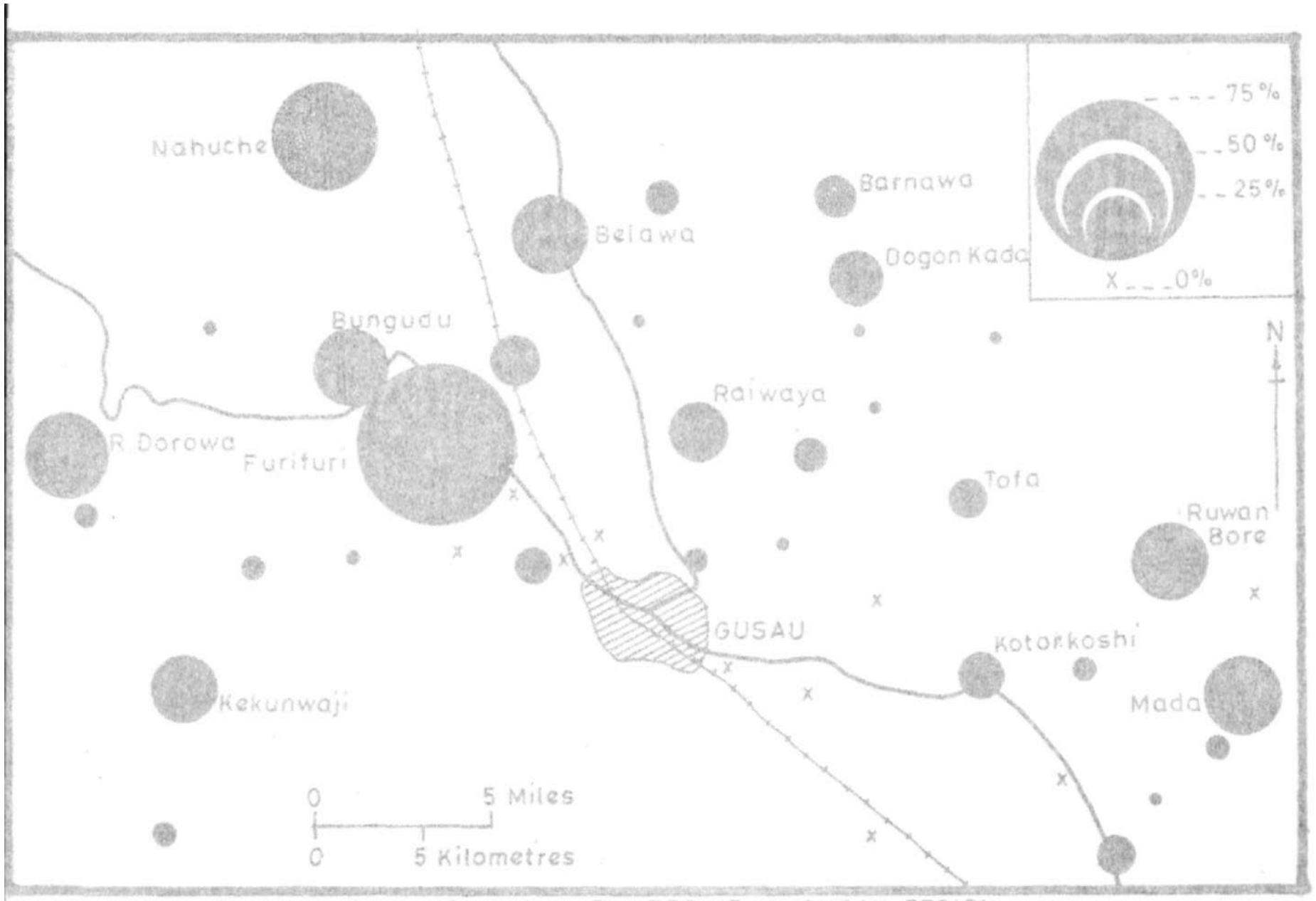


FIG.29, SPATIAL PATTERN OF MOTOR CYCLE OWNERSHIP IN GUSAU REGION

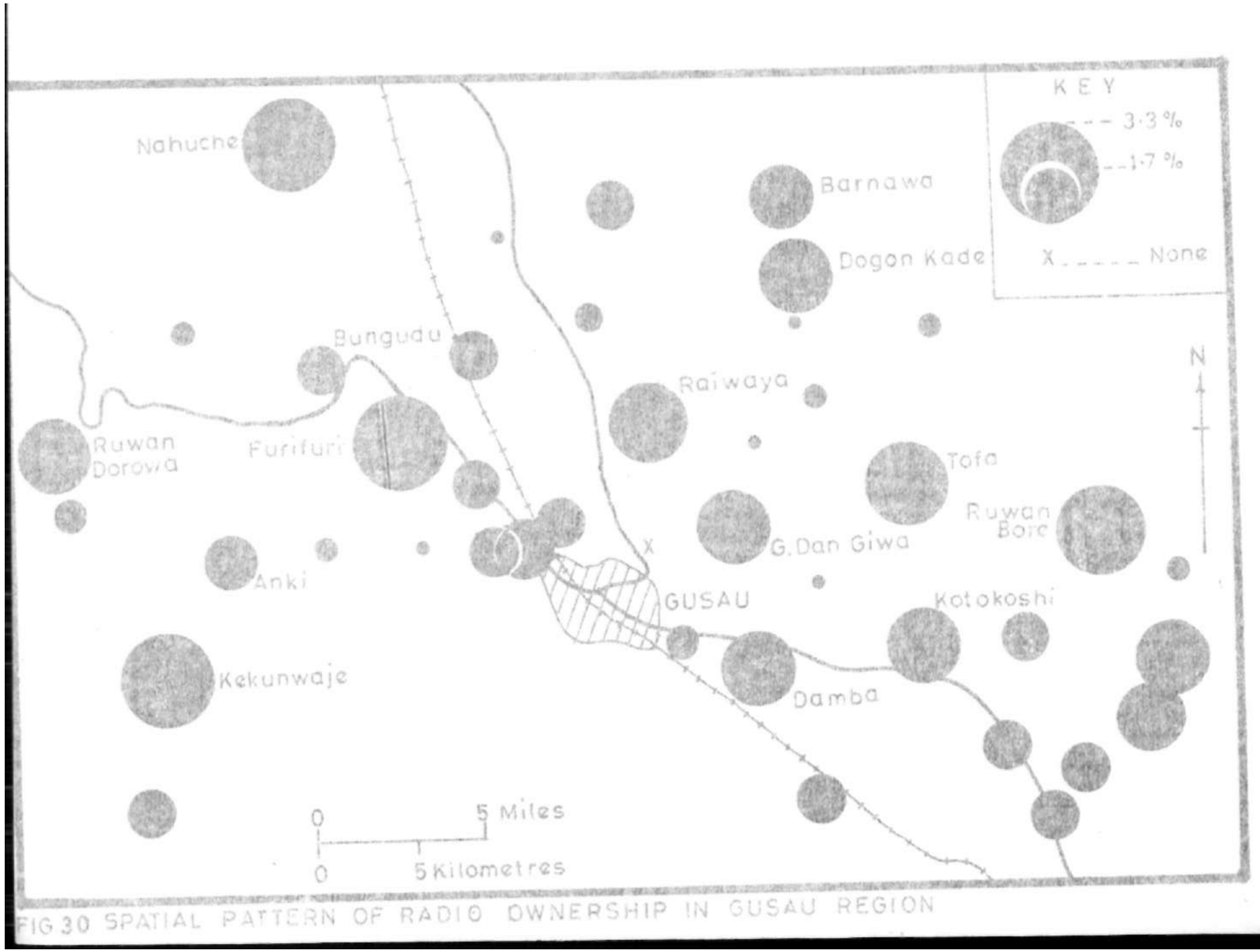


FIG 30 SPATIAL PATTERN OF RADIO OWNERSHIP IN GUSAU REGION

distance is not strong enough to warrant the expenditure on motorcycle.

Finally Fig. 30 shows the spatial pattern of radio ownership in the Gusau region. There is hardly any indication of conformity with theory. What is indicated is perhaps a reflection of rural wealth.

The overall impact of Gusau in the area of innovation diffusion can be said to be proven since in most of the selected innovations a distance decay pattern is indicated. Where this pattern is not indicated such as in the diffusion of fertilizer or tractor hiring services explanations are readily available. Even for the spatial diffusion of motorcycle and radio ownerships where the predictions of theory seem to be violated it is likely that a distance decay pattern should have emerged if we had considered the temporal aspect of diffusion.

The accessibility factor

"The range of the income effects of net investments stands in a positive correlation to the mobility of the population and quality of the transportation system" (Schatzl, 1973, p. 126). Thus the spread of development from Gusau correlates with the accessibility factor. It is in this regard that the activities of Gusau Agricultural Development Project (GADP) especially in the area of infrastructural development in the growth space, calls for a little more comment here.

The project is a ₦30.2 million government package of integrated investments which covers physical infrastructure, agricultural

supporting services and the supply and efficient distribution of farm inputs. As at the time of this study the GADP had invested some ₦2 million on the construction of about 500 kilometers of untarred but good all season roads in the study area. The importance of these new "project" roads becomes even greater when we realize that almost all the old untarred roads in the region have become mostly unusable by motor vehicles due to neglect and lack of maintenance. Fig. 4 shows the 'project' roads already in use. A more comprehensive road system is being planned for the project area and it seems that the project authorities have completely accepted the suggestion of Johnson that "a good road system can become unifying instrumentality that consolidates the productive power of an area and releases a latent social dynamism" (1970, p. 241).

Conclusion

From the analysis above two very important mechanisms of income transfer emerge. The first is the impact through purchases of raw materials, and the second is impact through flow of foodstuffs.

Even though only three of the growth centre factories do make use of raw materials produced from the region, purchases of these materials - mainly cotton and groundnuts, inject substantial financial resources into the Gusau region. Greater scope for further income and employment expansion exists through this mechanisim. As of now some 76.8 per cent of cotton needed and purchased by the factories comes from outside the region. This proportion is likely

to be even greater with the planned expansions in both the Zamfara Textile Industries and the ginnery.[18] While groundnuts production and hence income effect through its purchase is limited to areas with great proximity advantage to Gusau for reasons already discussed in the analysis, income effects through the purchases of cotton covers most parts of the study area, about a radius of 35 kilometers.

Expenditure on locally produced foodstuffs and firewood by growth centre workers constitutes another important source of income to the rural villages around Gusau. Again the analysis shows that this income is very substantial, (₦33,446 for grains, ₦57,220 for livestock, ₦525 for vegetables and ₦867 for firewood) totalling ₦92,058.00 on most market days. This income transfer affects a radius of some 5 kilometers for vegetables and about 30 kilometers for grains. With the present trend of ever increasing price level for locally produced foodstuffs and firewood it is reasonable to expect improvement in rural income.

Direct employment impact to the region is minimal and a great leakage to other regions of this vital impact mechanism is indicated. Likewise income transfer through financial remittances to the Gusau region is very small, even with a very optimistic estimate of the propensity to remit financial resources. 91 per cent of financial remittances leak out to other regions.

Finally growth centre impact through the diffusion of innovations appears to be proven since the pattern shown in most of the analyses indicate distance decay.

Footnotes

6. Income relationship between the various employment categories is very wide (see Table 20).

7. This refers to the Nigerian Cotton Board and the Nigerian Groundnut Board, the Northern States Marketing Board having been broken up and renamed. The commodity boards undertake the purchase of the commodities from the local farmers through some authorised buying agents at the various commodity markets set up for the purpose in certain collecting centres of the rural areas. The boards also supply the factories with all the cotton and groundnuts they need.

8. The practice is to lump production into these various markets and a breakdown into smaller production units is therefore impossible.

9. Source is field survey, 1977.

10. The proportion of the monthly income remitted to any region will depend on a number of factors, some of the more important of which include:

(a) the proportion of all migrants that come from that region

(b) the employment categories to which most of these migrants belong and the income relationship between these categories

and (c) the propensity of the migrants to remit money home.

The greater the proportion of migrants from a particular region the larger the proportion of total remittances which

will go to that region.

Employment categories of migrant workers will influence the amount of remittances made in the sense that the higher the class of workers the greater the probability that larger sums of money will be involved. This is so more especially if the income relationship between the categories is very wide (Table 20).

The propensity to remit money home will depend not only on the employment category the migrant worker belongs to, it will also depend on the degree of the migrants attachment to his home region. It is likely that migrants from distant regions who have little cultural ties with the region of employment will have greater attachment to their home regions and consequently may send greater proportion of their income home for some projects they may have back at home.

11. 7.2% propensity to remit money home is derived from the industrial workers survey and the survey of Gusau residents. From the questions on their total monthly income and the pattern of expenditure of this monthly income 7.2% is worked out as the proportion of total monthly earnings sent home as remittances by migrant workers.
12. The figure is actually ₦7,929,368.00 made up of ₦7,145,610.00 for cotton (23,191 tons at ₦308.00 a ton) and ₦783,758.00 for groundnuts (3135 tons at ₦250.00 a ton)

13, 14, 15, and 16: See Tables 22, 23, 24, and 25 respectively.

17. The situation in Furifuri is a special case and can be explained by the activities of Gusau Agricultural Development Project. This organization has a large service centre at Furifuri and a large number of extension workers are stationed here in a housing scheme. Furifuri people have been very much influenced by the G.A.D.P. activities and many of them have also become relatively wealthy as a result.

18. It is planned to move the headquarters of Zamfara Textile Industries Ltd. from Kaduna to Gusau and to more than double the size of the existing factory at Gusau. The construction of this bigger plant is nearing completion at the time of this investigation. This may mean that the ginnery which supplies the factory with cotton lint may be required to increase its output and seed cotton requirement. In fact, planned expansion to the ginnery which is on the verge of execution is said to be worth well over ₦1.25 million.

CHAPTER FOUR

THE SPATIAL PATTERN OF DEVELOPMENT AROUND GUSAU

Introduction

"The test for the expected interplay of spread and backwash effects is one of form rather than process" (Robinson and Salih, 1971, p. 310). But it has also been argued that the development surface is the morphological expression of a dynamic model and so the primary concern of this chapter is that the form obtained from an empirical study should relate to the processes which brought it about.

Recalling Friedmann's conception of the space-economy discussed in chapter one, theory suggests that the development level decreases with distance away from the growth centre. Examples of this situation have been identified and described in the growth space around Lagos (Ajaegbu, 1967) Kano (Mortimore, 1967, 1970, 1971) Zaria (Norman, 1967; Davies, 1970) and also have been reported in several other parts of the world (Schultz 1951; 1953). Furthermore, the concentric zonal pattern of economic activities, agricultural production, rural income and development around towns like Kano, Zaria, Onitsha and other markets (Logan 1970) reflect the distance decay characteristics.

The concentric downward gradation of development levels, outwards from the growth centre is an idealized response surface resulting from growth stimuli generated at and by the centre. Under the conditions of optimal internal growth processes at the centre, homogeneous growth space and other assumptions discussed in chapter one the decreasing elevation of the response surface, as measured by the development

level at particular points is determined, solely by distance from the centre.

The growth space: indices of development

Economic development is a multi-dimensional concept and so cannot be operationally defined by a single variable. This is why it "is often expressed in the form of several indices combining information on incomes, employment, productivity and other pertinent socio-economic characteristics" (El Kammesh 1963 in Robinson and Salih 1971 article p. 305). In an effort to portray as many aspects as possible of the level of prosperity and the state of development of the 42 sample villages of the growth space around Gusau, 8 variables which are assumed to provide some measure of economic development were selected and examined.

Variable 1 is an index of the average income of respondents in the growth space. From the responses to questions 30(a) and 30(b) questionnaire B (Appendix 1b) the average income of respondents in each of the sample villages was calculated. In a correlation analysis with the independent variable - distance from Gusau, a coefficient of - 0.51, significant at 99.9%, was obtained. The scatter diagram of this variable (Fig. 31) indicates the distance decay pattern suggested by theory.

Variable 2 is the degree of attractiveness to migrants as measured by the percentage non-native population. "There is increasing agreement and evidence that the predominant motive behind

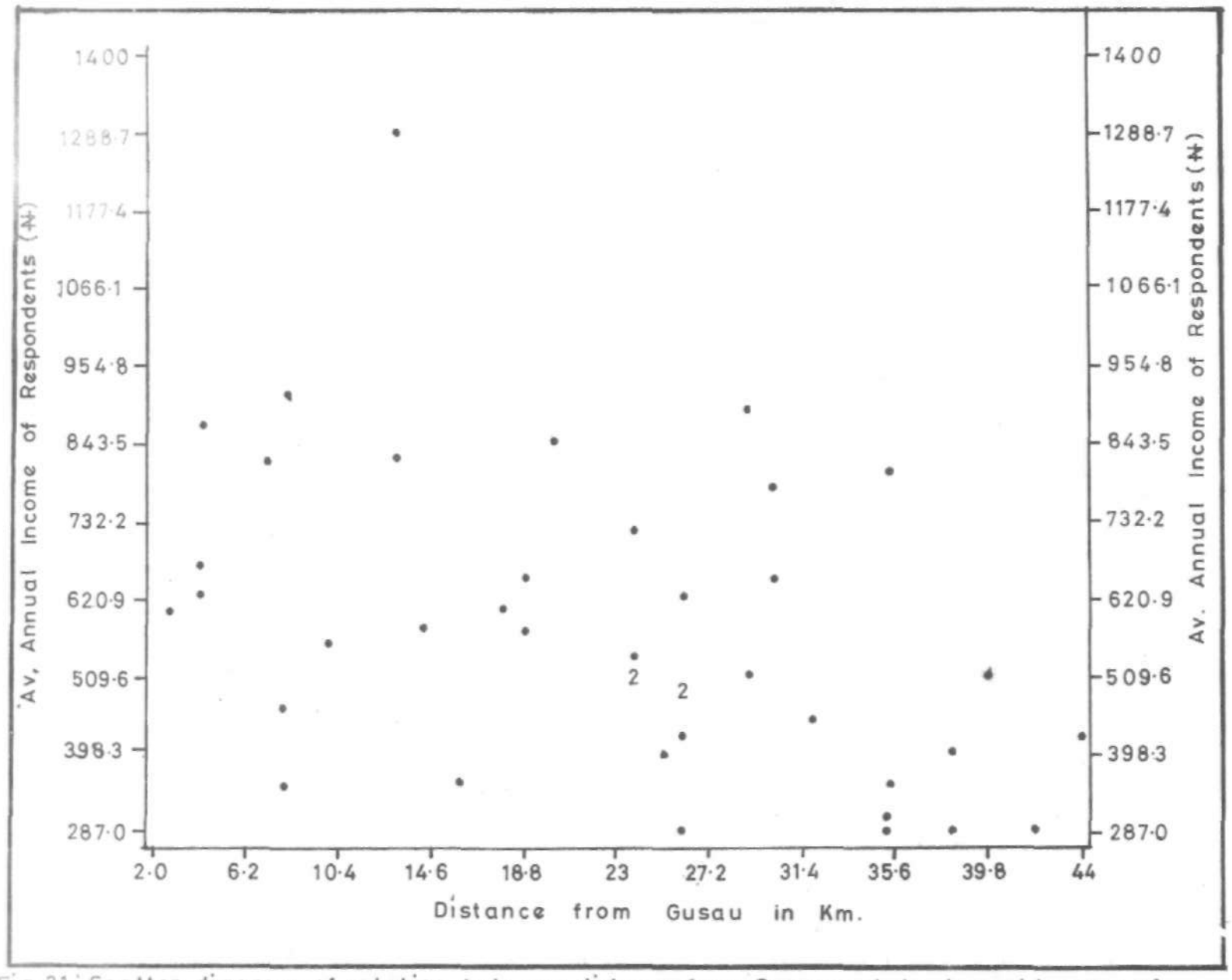


Fig.31 : Scatter diagram of relation between distance from Gusau and Av Annual income of respondents.

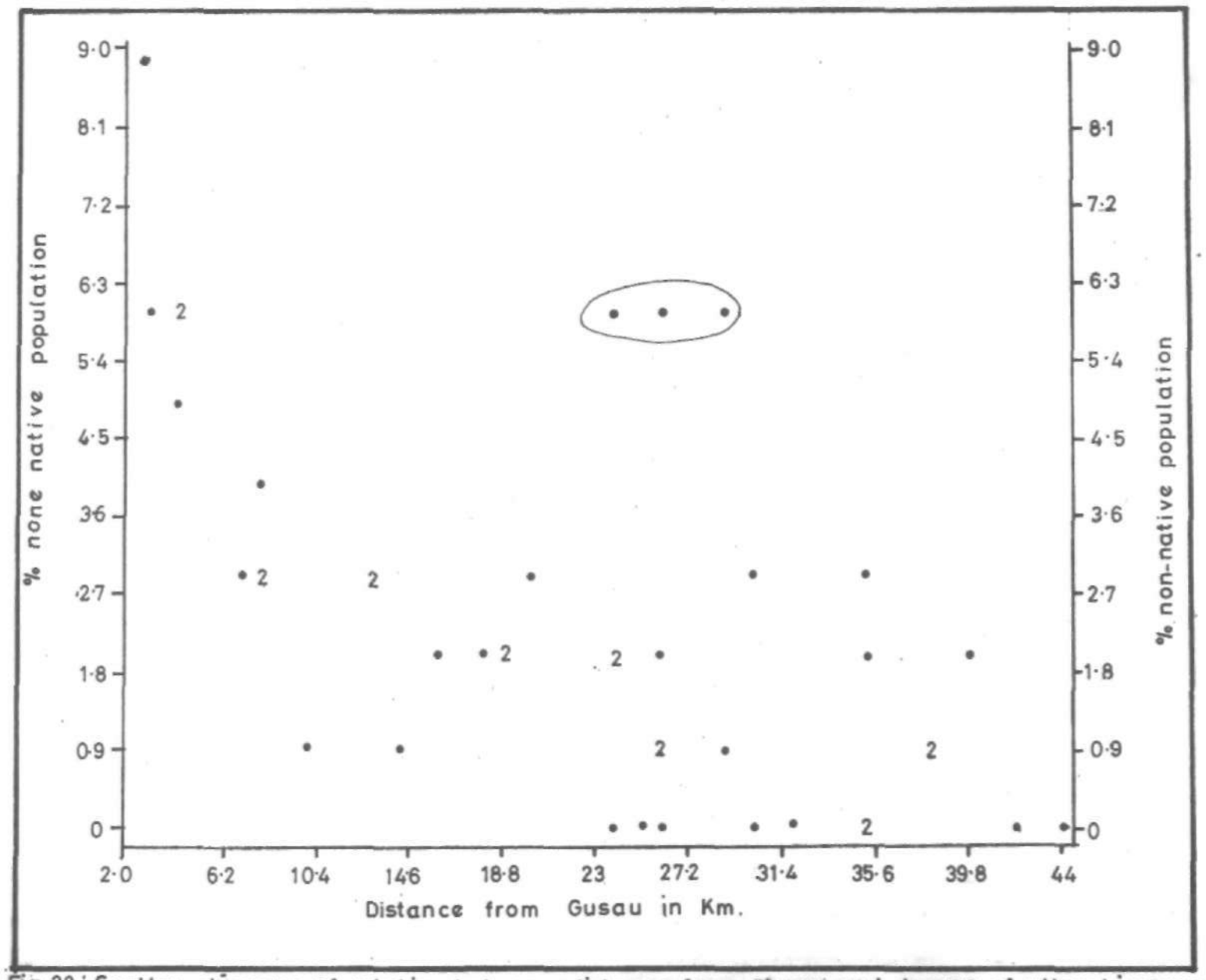


Fig 32: Scatter diagram of relation between distance from Gusau and degree of attractiveness to migrants.

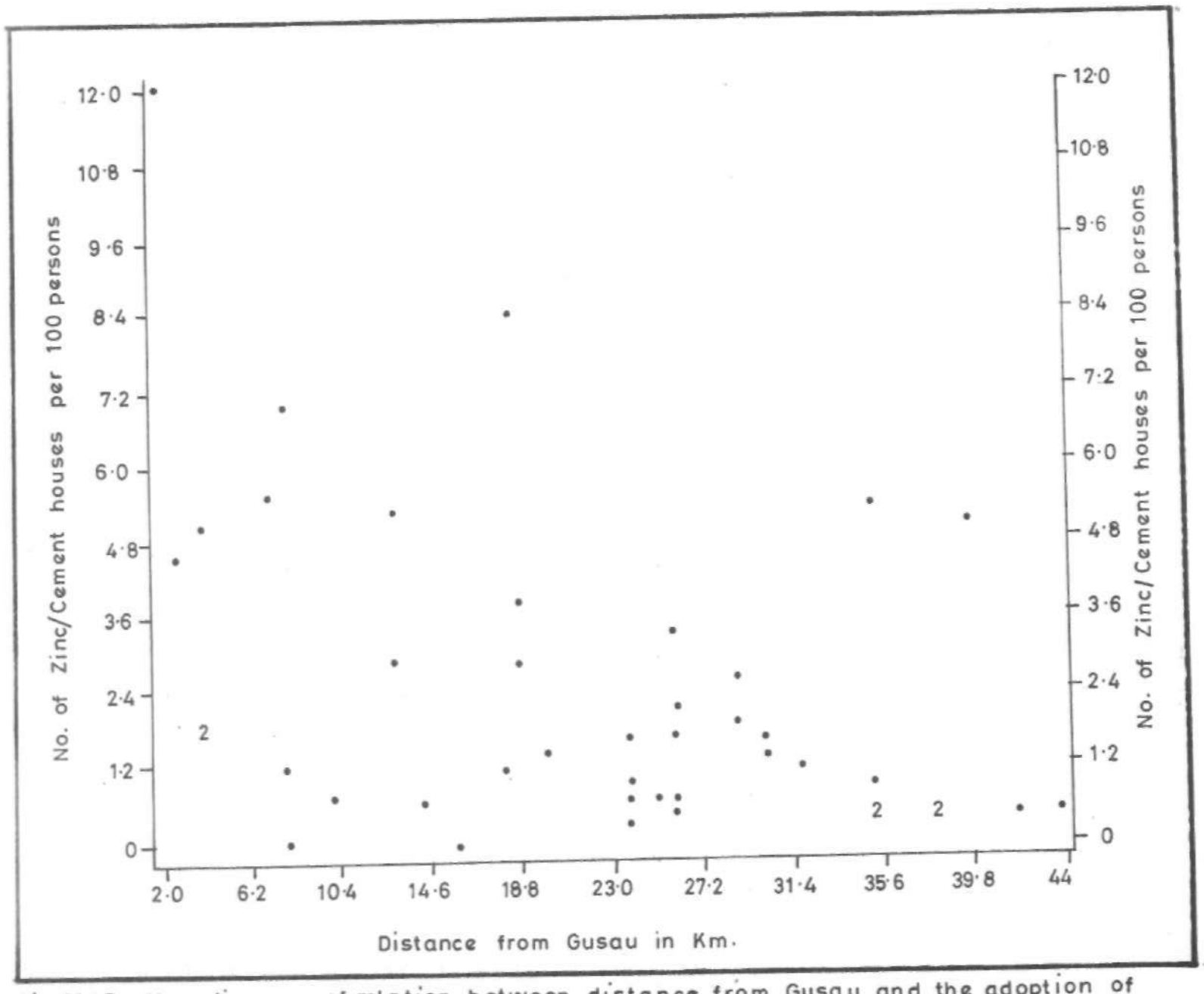


Fig. 33: Scatter diagram of relation between distance from Gusau and the adoption of Zinc/Cement as building materials

most decisions to migrate is economic need and desire" (Hance, 1970 p. 186). The choice of a destination by migrants therefore indicates the migrants perception of the ability of the destination to satisfy his economic need and desire. Thus, such choice of destination is likely to be greatest at the growth centre and theoretically, the attractiveness of other places should decrease with distance away from it. In a correlation analysis with the distance variable, variable 2 produced a coefficient of -0.61, significant at 99.9% level. This is shown in a scatter diagram which reveals the distance decay function (Fig. 32).

Variable 3 measures the diffusion of zinc and cement as building materials. The use of zinc and cement as building materials not only indicates the wealth of the community, since such materials are much more expensive than their traditional counterparts, but it also indicates the community's degree of sophistication or contact with urban life, (zinc and cement being obvious innovations introduced into the rural community through contact with urban life). The idea then is that the wealthier and more sophisticated a community is, the greater the likelihood that zinc and cement will be adopted as building materials. Again, according to the growth centre theory, this is supposed to vary inversely with distance from a growth centre. A correlation of this variable with distance from Gusau, gives a coefficient of -0.42 and a significance level of 99.7%.

Variables 4, 5 and 6, i.e. percentage respondents who increased

their farm holdings in 1976/77; percentage respondents who increased their cotton production in 1976/77 season; and percentage respondents who applied fertilizer to their farms in 1976/77 respectively, relate to improvements in agriculture. Correlated with the distance variable these variables produced positive correlation coefficients of .3188, .0043 and .2355 and significance levels of 98%, 51.1% and 94.3%. This for obvious reasons is to be expected. Increase in farm holding will depend among other things on the availability of land and the population density. It is to be expected that population density will be greater with proximity to the growth centre and the availability of land for the expansion of farm holdings would therefore be smaller. Agricultural landuse is usually on the intensive rather than the extensive margin the closer one moves to an urban centre. For the increase in cotton production, again the distance variable may not be important here as the areas of greatest cotton production in the growth space need not vary with distance from the growth centre. In fact cotton will have to compete with market gardening for land in areas immediately adjoining the growth centre. It is clear that these highly demanded perishable commodities will push cotton out of this zone since proximity to market is a most important consideration for their production. It is therefore expected that cotton production will become important at some distance away from the growth centre where land is more readily available. The application of fertilizer also need not correlate with distances from Gusau..

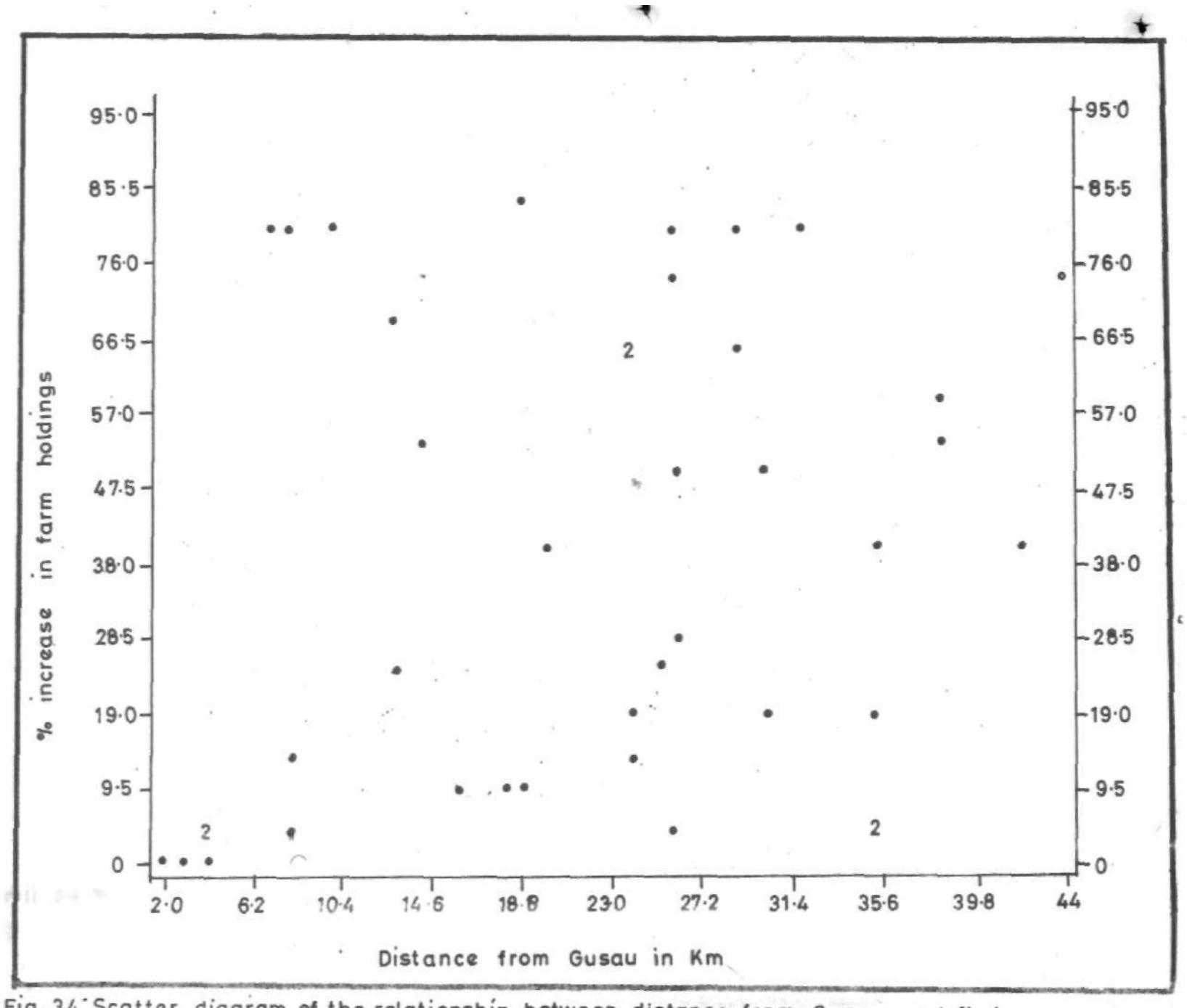


Fig. 34: Scatter diagram of the relationship between distance from Gusau and % increase in farm holding.

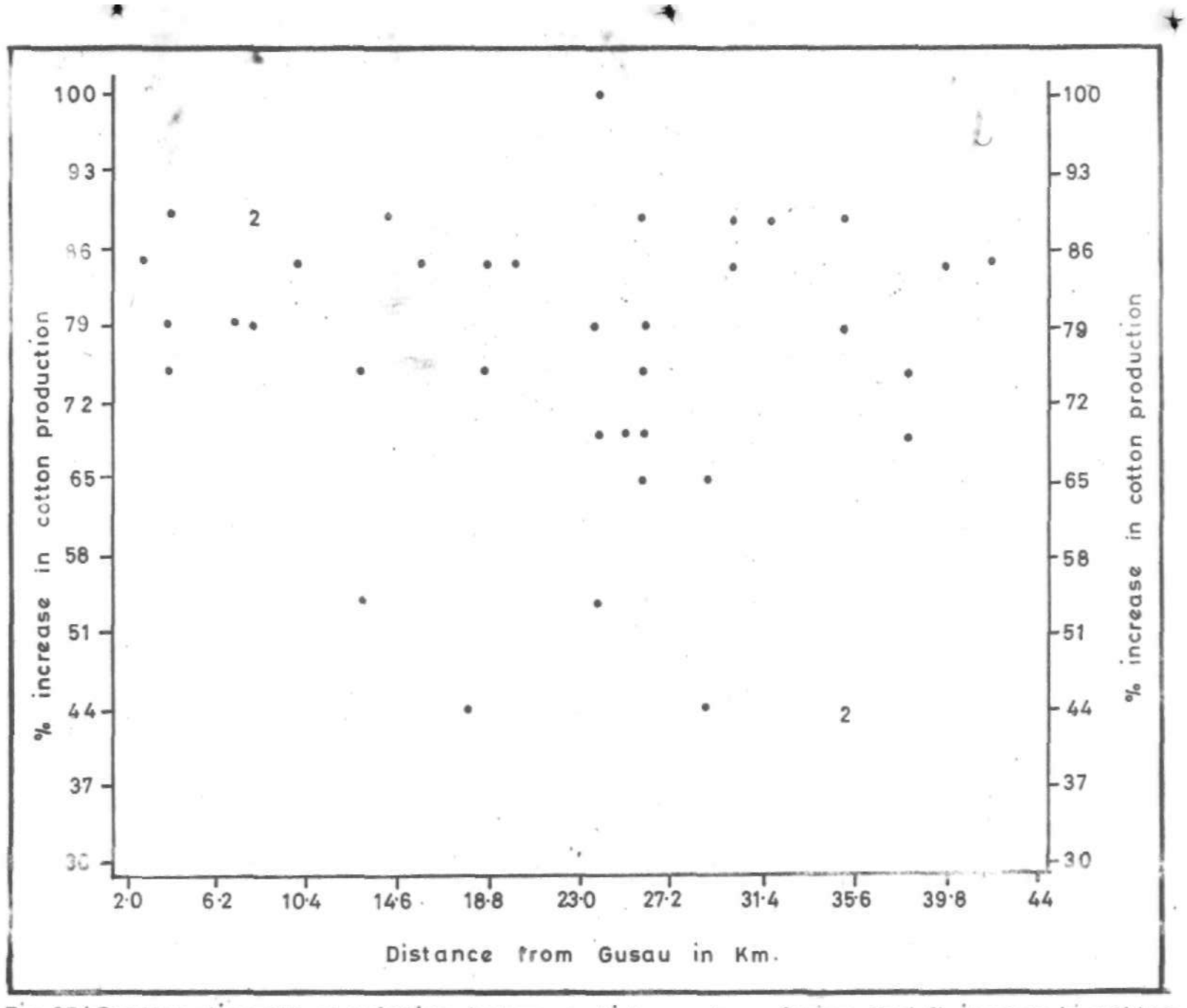


Fig.35: Scatter diagram of relation between distance from Gusau and % increas in cotton Production.

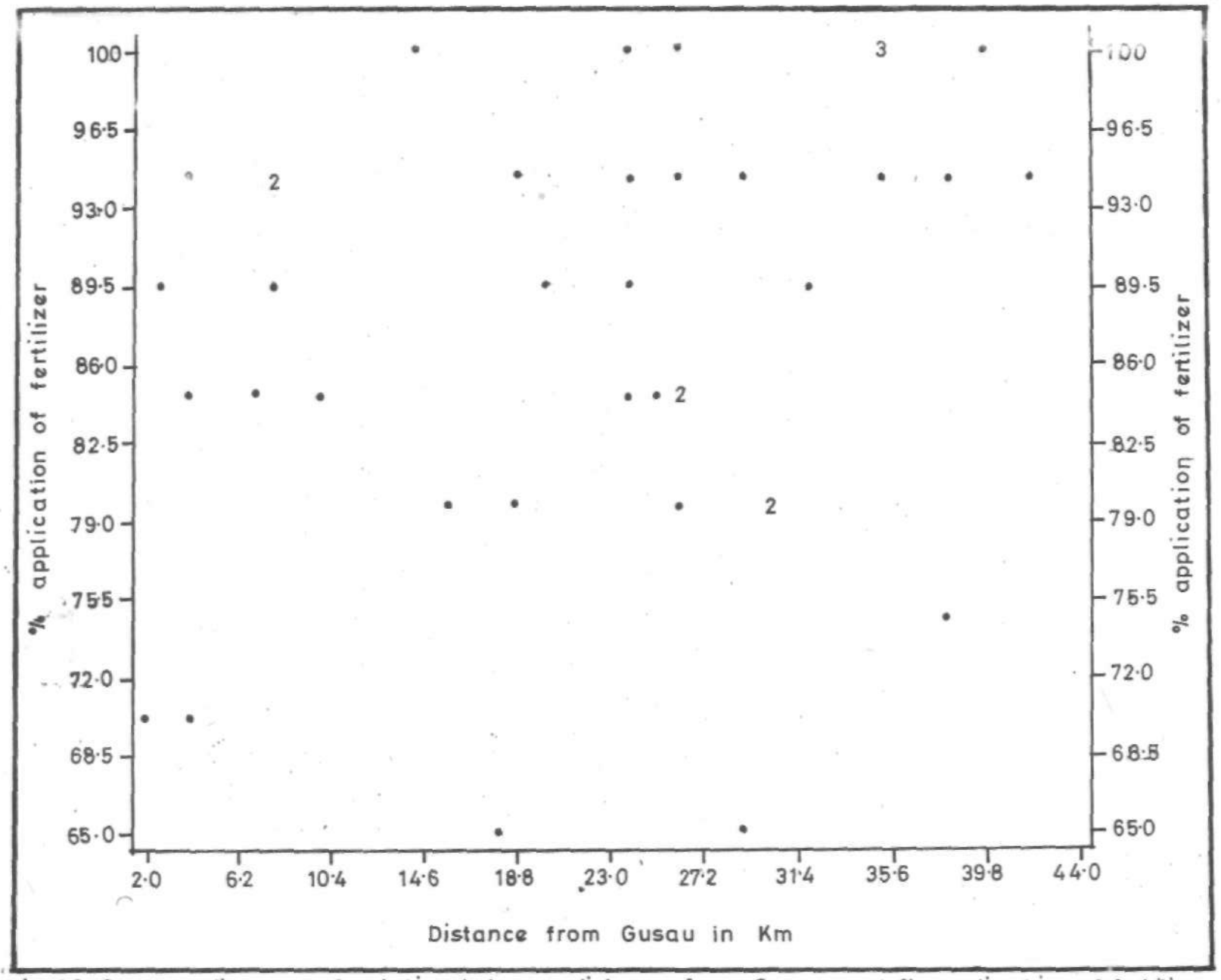


Fig 36: Scatter diagram of relation between distance from Gusau and % application of fertilizers

If the diffusion of the use of fertilizer is complete in the growth space, then there will be no indication of the distance decay pattern.

Table 26: Scores of villages on the variable measuring improvement in agriculture

	No. of villages scoring			
	0-25%	26-50%	51-75%	76-100%
On variable 4	19	6	9	8
" 5	0	5	8	29
" 6	0	0	5	37

Source: Figs. 34, 35 and 36

The high scores of the villages on the three variables as indicated by Table 26 show that there is a positive response to the increased demand for agricultural production generated in the growth centre.

Variables 7 and 8 relate to those 'priced possessions' that could be assumed to indicate the wealth of their owners in the rural areas, namely ownership of radio and sewing machines. These are correlated with the distance variable and the very low positive coefficients of 0.20 and 0.24 and significance levels of 89.2% and 93.9% respectively were produced.

Interesting patterns however emerge from the scatter diagrams. Percentage ownership of radio comes out with a peculiar pattern which seems to suggest waves of diffusion. Breaks in the scatter diagram

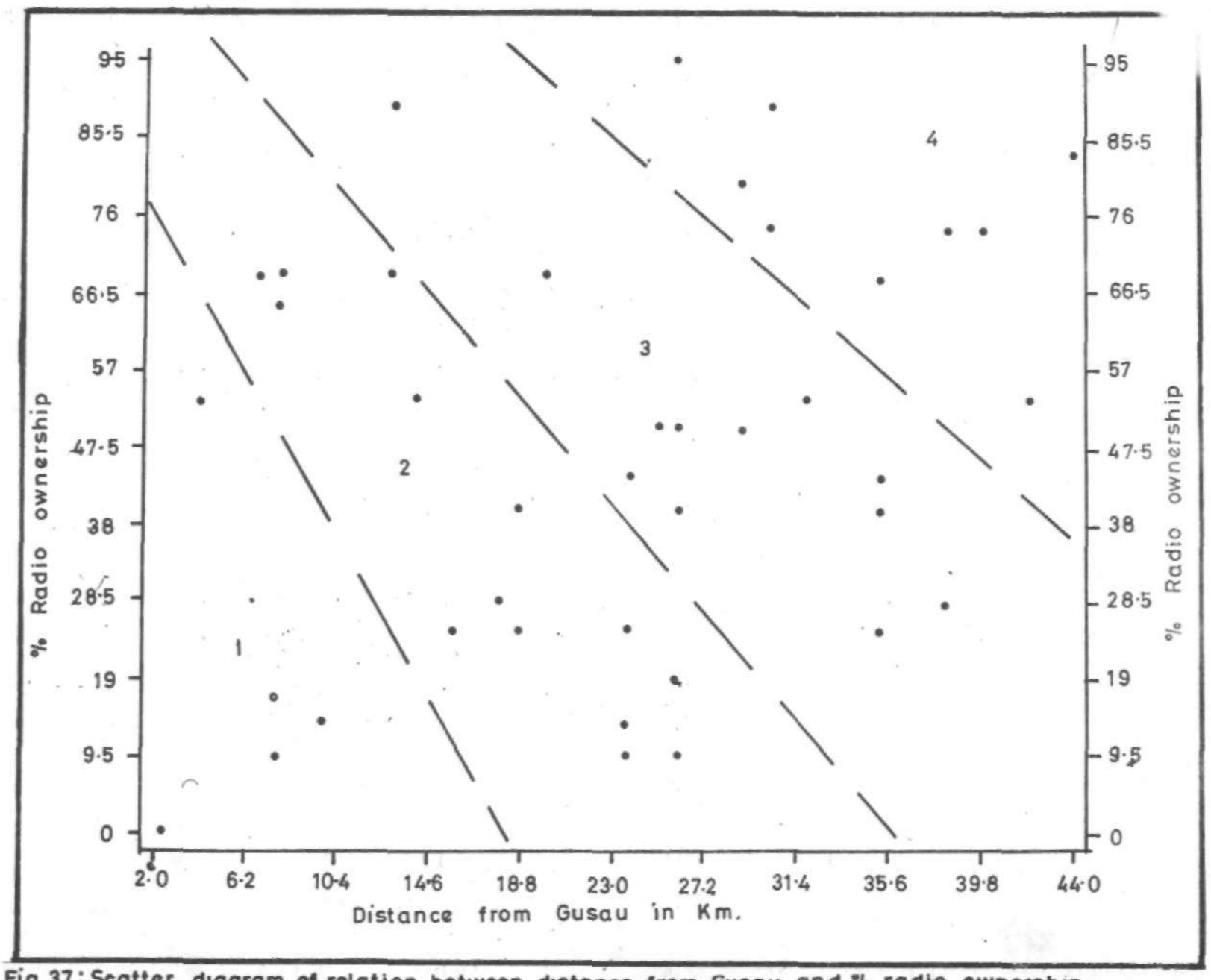


Fig 37: Scatter diagram of relation between distance from Gusau and % radio ownership

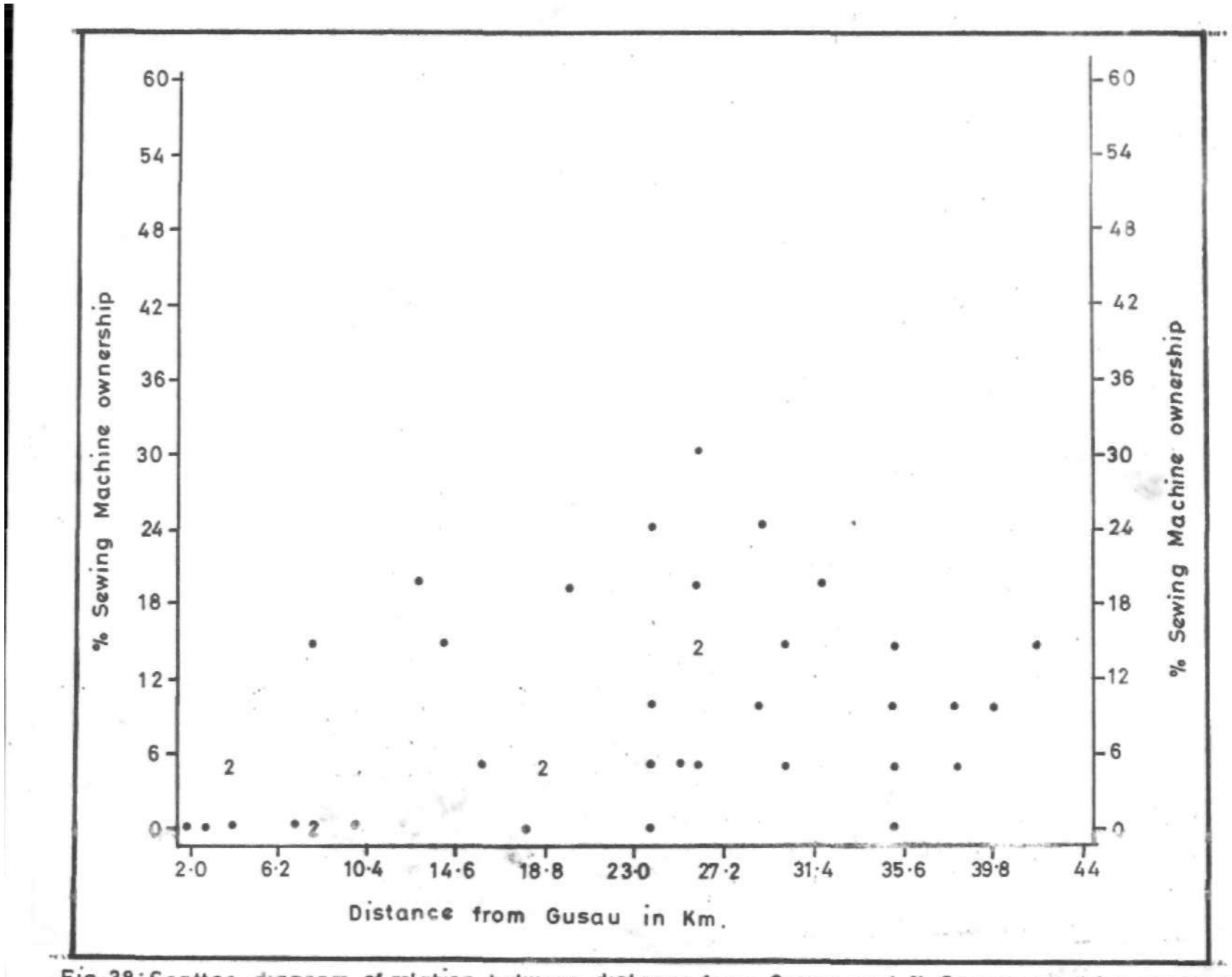


Fig. 38: Scatter diagram of relation between distance from Gusau and % Sewing machine ownership

(Fig. 37) seem to indicate at least four distinct waves, all indicating distance decay functions. The scatter diagram of variable 8, percentage ownership of sewing machines shows a pattern which increases with distance up to some 20 kilometers and then declines. This is to be expected. The lower percentage ownership of this commodity close to Gusau reflects the competition with numerous and more skilled tailors of Gusau. From about 20 kilometers away where the effects of this competition is substantially reduced the normal distance decay pattern emerges.

Table 27: Correlation analysis: significance of the selected indices.

Dependent Variables	Correlation Coefficient	Significance
1. Average income of respondents in 1977	-0.51	0.001 or 99.9% **
2. Degree of attractiveness to migrants as measured by % non-native population	-0.61	0.001 or 99.9% **
3. Diffusion of zinc/cement as building materials	-0.42	0.003 or 99.7% **
4. % respondents who increased farm holdings in 1976/77	0.32	0.02 or 98.0% *
5. % respondents who increased cotton production in 1976/77 season	0.004	0.49 or 51.1%
6. % respondents who applied fertilizer to farms in 1976/77	0.24	0.067 or 93.3%
7. % respondents who owned radio	0.20	0.108 or 89.2%
8. % respondents who owned sewing machines	0.24	0.061 or 93.9%

Source: Field survey 1977.

Note: Significance level 95%-98.9% * Significant

99.0%-99.9% ** Highly significant

Table 28: Deviations from the mean scores of villages on the 8 variables being considered.

Villages	X & Y co-ordinates of villages (50x32/0.5cm sqs)	Variable 1 Av.Income of respondents in 1977 (₦00)	Variable 2 % non-native population	Variable 3 No of tnc/ cement houses per 100 persons	Variable 4 % increase in farm holdings 1976/77 $\frac{1}{10}$	Variable 5 % increase in cotton production 1976/77 $\frac{1}{10}$	Variable 6 % application of fertilizer 1976/77 $\frac{1}{10}$	Variable 7 % radio ownership $\frac{1}{10}$	Variable 8 % sewing machine ownership $\frac{1}{10}$
Mean score		6.04	2.45	2.33	4.02	7.57	8.90	4.87	1.09
01 Furifuri	1618	7.01	0.55	2.97	2.96	-0.07	1.10	4.13	4.91
02 Jenyau	2214	0.64	3.55	-0.33	-3.54	-0.07	-1.91	0.63	-1.10
03 Kadusa	0603	-3.04	-2.45	-1.63	-3.54	1.43	1.10	-0.37	-1.10
04 Marke	4305	-2.44	-0.45	-1.73	-2.04	0.43	0.60	-0.87	-0.10
05 Mahuche	1229	1.84	-2.45	-0.53	0.96	1.43	-0.91	4.13	-0.60
06 Dogon Kade	3224	0.46	0.55	-0.73	-2.04	0.93	-0.91	2.63	0.41
07 Kada	4608	1.96	0.55	2.97	-3.54	-3.07	1.10	2.13	0.41
08 Ruwan Bore	4414	-1.66	-2.45	-1.73	3.46	1.93	1.10	3.63	1.91
09 Rumji	1921	-0.20	-1.45	-1.53	1.46	1.43	1.10	0.63	0.41
10 Tofa	3616	-0.82	-1.45	-0.33	2.46	-1.07	0.60	3.13	1.41
11 Raiwaya	2618	2.39	0.55	0.57	-1.54	-2.07	1.10	2.13	0.91
12 Gidan Dan Giwa	2914	2.36	0.55	3.27	3.96	0.43	-0.41	2.13	-1.10
13 Yar Dotun Daji	4202	2.96	3.55	0.47	3.96	-3.07	-2.41	0.13	-0.10
14 Gada	0822	-0.74	-2.45	-2.03	-2.04	-0.57	1.10	-2.37	-0.60
15 Kotorkoshi	3709	2.52	0.55	-0.83	-0.04	0.93	0.10	2.13	0.91
16 Rututu	2527	-1.84	-2.45	-1.43	-1.54	-0.57	-0.41	0.13	-0.60
17 Gidan Gyare	3017	-0.36	-1.45	-1.43	3.96	0.93	-0.41	-3.37	-1.10
18 Gidan Kaharagu	2613	0.16	3.55	2.37	-4.04	0.93	0.10	-4.87	-1.10
19 Nareri	2710	0.36	3.55	2.77	-3.54	0.43	0.60	-0.87	-0.60
20 Ruwan Dorowa	0218	-0.84	-0.45	2.87	5.46	0.93	1.10	2.63	-0.10
21 Kekunwaje	0709	-1.12	-1.45	-1.53	3.96	-1.07	0.60	4.63	1.91
22 Belawa	2026	1.18	3.55	-1.53	2.46	2.43	0.60	-3.87	-0.10
23 Jimirawa	3722	-3.10	-2.45	-0.43	-1.04	-0.57	-4.01	-2.87	0.91
24 Bungudu	1321	0.50	-0.45	1.57	4.46	-0.07	0.60	-0.87	-0.60
25 Auki	0913	-1.56	-2.45	-1.03	3.96	1.43	0.10	0.63	0.91
26 Ribe	3312	-0.96	-1.45	-0.03	-3.54	-0.07	-0.41	-3.87	0.41
27 Mamula	2423	0.16	-0.45	-1.03	-2.04	-3.07	-2.41	-1.87	-1.10
28 Tsuna	4712	-2.77	-2.45	-1.33	-0.04	-3.07	1.10	-2.37	-0.60
29 Aberma	2013	2.83	2.55	-0.33	-4.04	1.43	-0.41	-0.87	-0.60
30 Tizame	4005	-0.74	-0.45	-0.53	2.46	0.43	0.10	-0.37	1.41
31 Karazau	3304	0.36	3.55	1.07	3.46	0.43	-0.91	0.13	0.41
32 Samowa	3222	-0.61	-0.45	-1.33	-2.54	-2.07	-0.41	-3.87	-1.10
33 Wazoji	3319	-0.16	-0.45	0.57	-3.04	0.93	-0.91	-2.37	-0.60
34 Danmagari	0315	-1.84	-1.45	-1.63	1.46	-0.07	-1.41	-1.87	-0.60
35 Danba	3009	3.16	0.55	4.67	-3.54	1.43	0.60	2.13	-1.10
36 Mahuta	2114	7.96	6.55	9.67	-4.04	-4.57	-1.91	1.63	-1.10
37 Barnawa	3127	-3.17	-2.45	-1.73	-0.04	0.93	0.60	0.63	0.41
38 Shemori	4506	-3.08	-1.45	-1.73	1.96	-0.57	0.60	2.63	-0.10
39 Gidan Usman	1314	-2.34	-0.45	-2.33	-3.04	0.93	-0.91	-2.37	-0.60
40 Nagogawa	1714	-2.48	0.55	-2.33	-2.54	0.43	0.60	-3.87	0.41
41 Gidan Ali	1916	-1.34	1.55	-1.03	3.96	1.43	0.10	1.63	-1.10
42 Ungwan Jaki	4109	-1.76	-0.45	-1.63	0.96	1.43	1.10	-0.87	-0.60

Spatial surfaces created by the eight indices selected

Deviations from the mean scores of the 42 sample villages in the growth space are presented in Table 28. Map of spatial surfaces were then constructed from this array of data.

The average income of respondents surface (Fig. 39) depicts the distance dacay pattern with income levels generally declining with distance away from Gusau. The '0.0' contour line demarcates zones of positive residuals from those of negative residuals. Within the zone of positive residuals are two major heights that interrupt the normal concentric zone pattern; namely the Raiwaya (2.39), Damba (3.16) and Kotorkoshi (2.52) axis and the Furifuri peak (7.01). There is also within this zone, a depression around Runmji (-0.2) further interrupting the largely concentric zonation. Likewise below the '0.0' line isolated "islands" of positive residuals can be noticed. Dogon Kade and Mada with average income index of 0.46 and 1.94 are examples. The extent of the zone of positive residuals as shown on this surface is worked out at an average of 15 kilometers radius of Gusau.

The surface of degree of attractiveness to migrants also shows a concentric pattern with decreasing values as one goes outwards from Gusau. Once again the major cause of distortions are the roads and the presence of certain rural growth centres. The zone of positive residuals around Gusau has an average radius of just over 10 kilometers (that is, if we ignore the distortion caused by the Gusau-

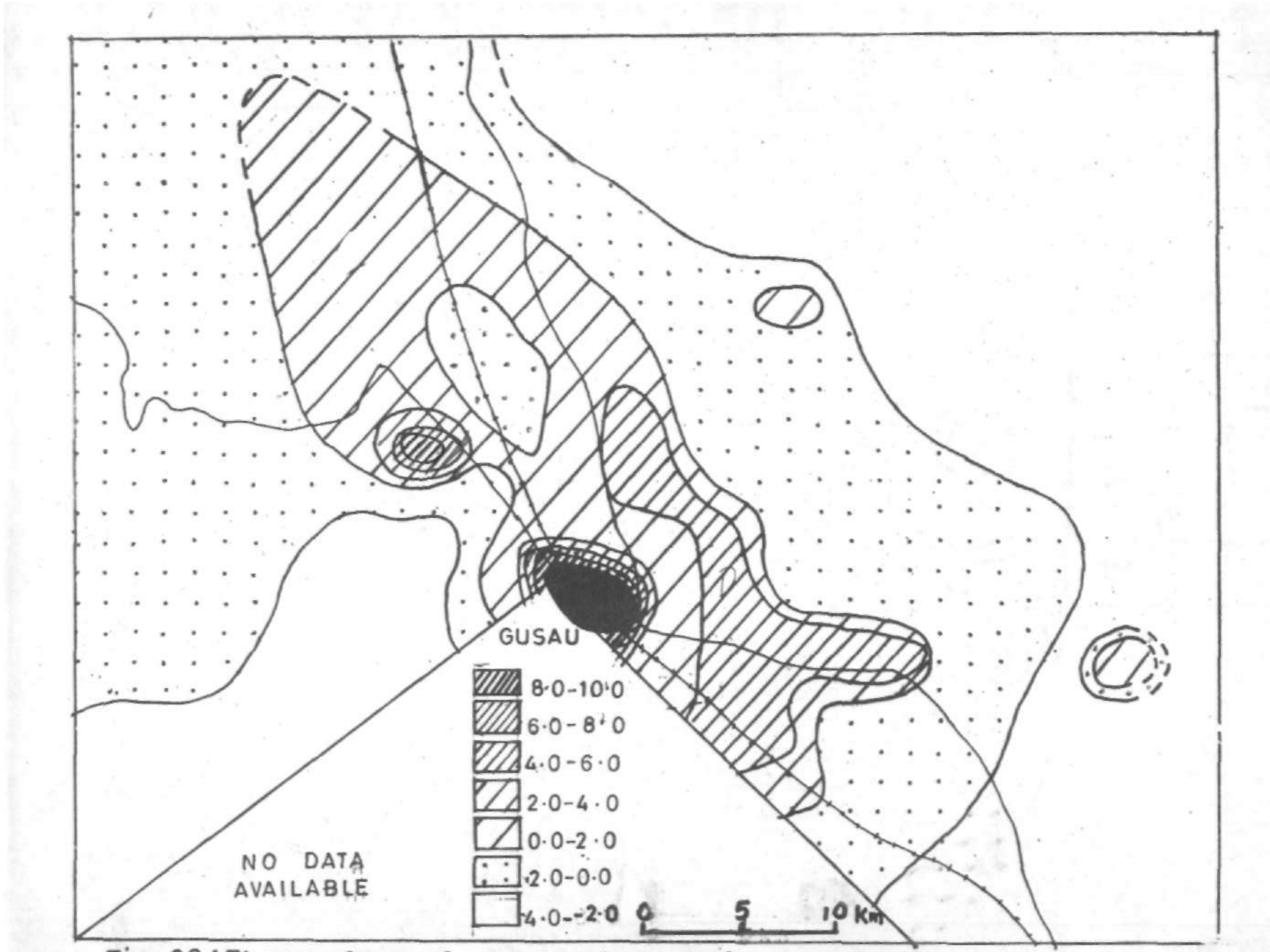


Fig. 39 : The surface of average income of respondents.

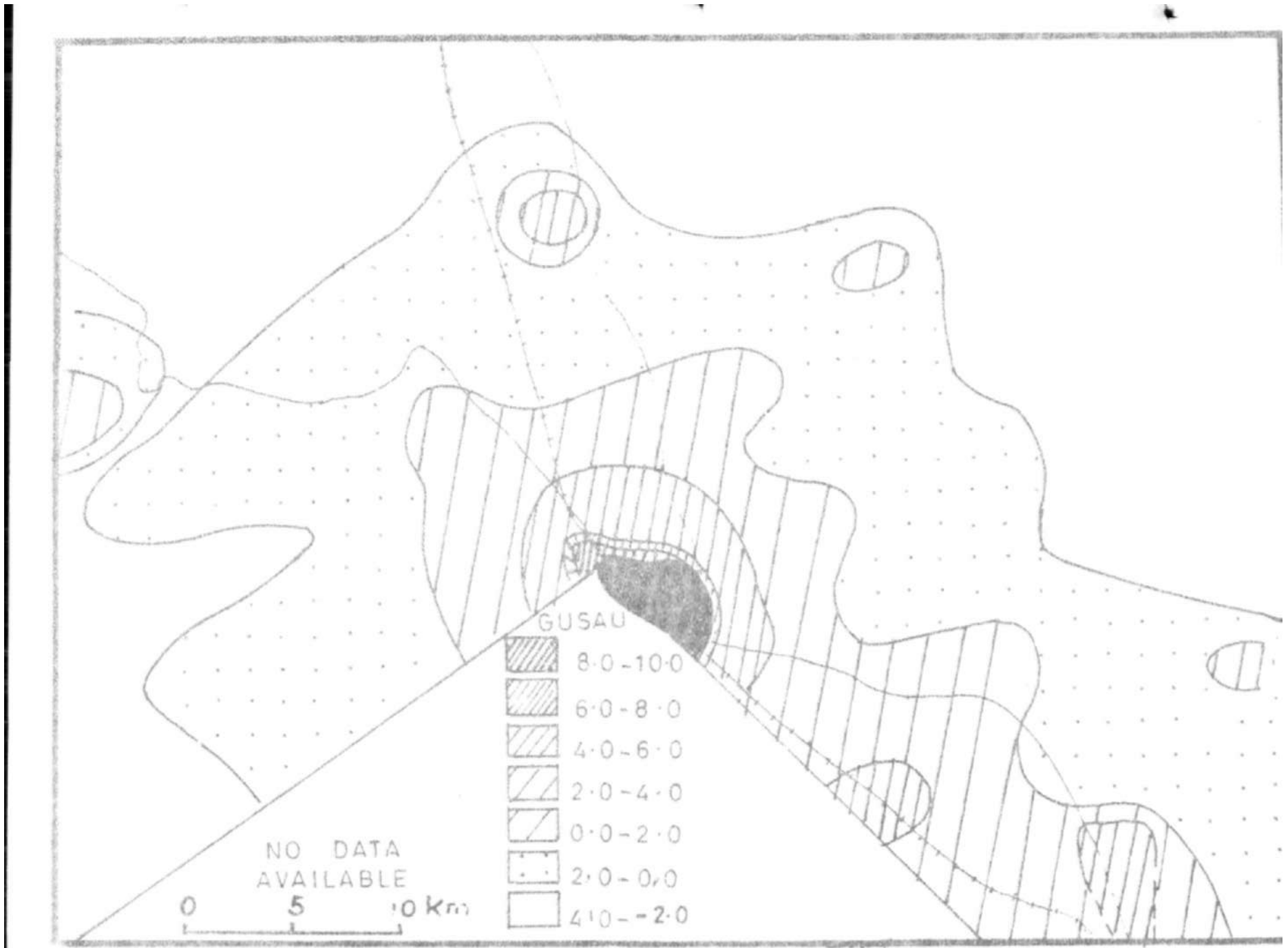


Fig.40:The surface of the degree of attractiveness to migrants.

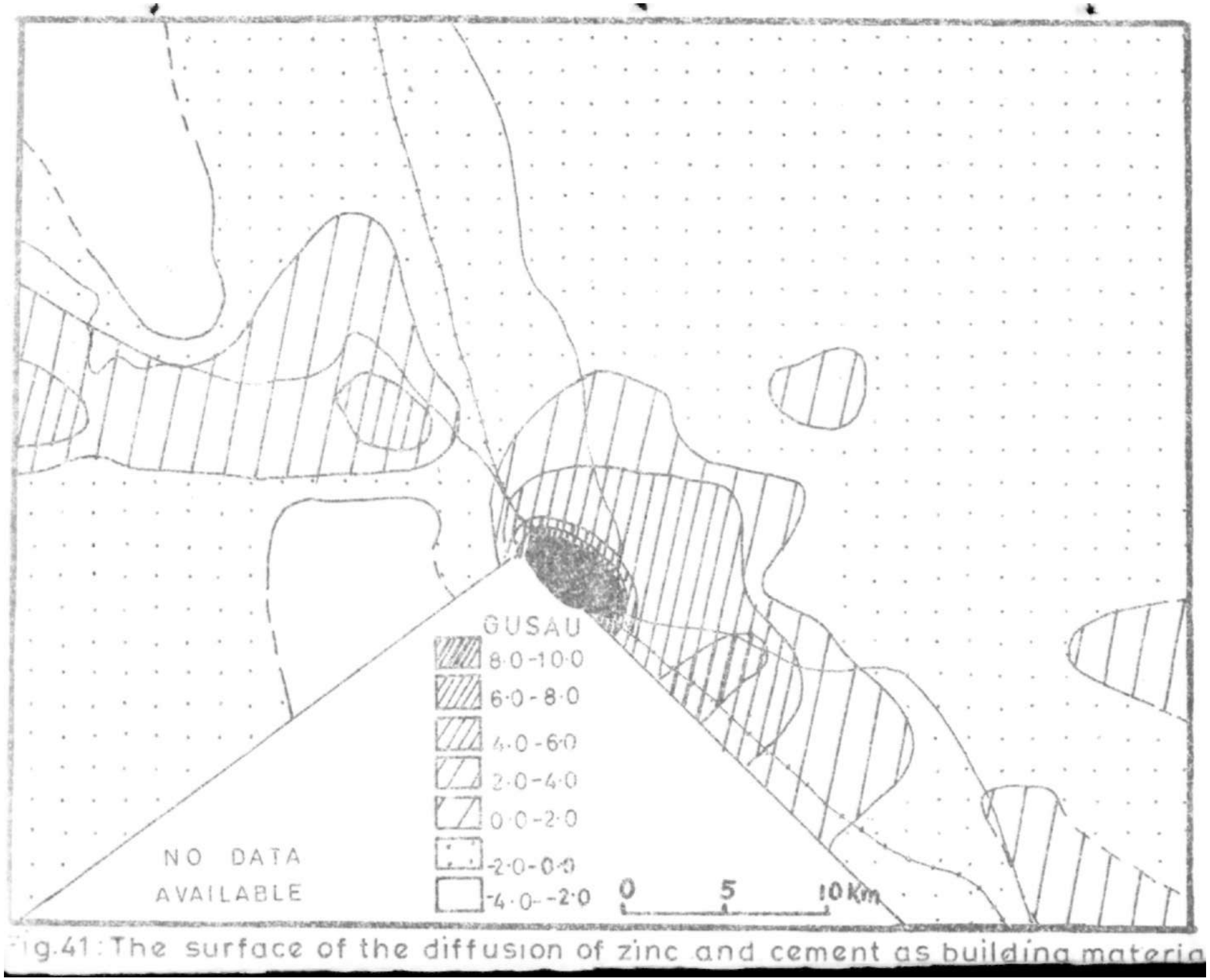


Fig.41: The surface of the diffusion of zinc and cement as building materia

Zaria road. Within this zone Yar Dotun Daji (2.55) and Karazau (3.55) emerge as isolated heights while outside the zone the main "islands" of positive residuals are Ruwan Dorowa (4.10) Belawa (3.9) Dogon Kade (0.55) and Mada (0.55).

Like the preceeding two surfaces, the surface of the diffusion of zinc and cement as building materials also depicts a concentric zone pattern around the growth centre. Again both the radial pattern and the hierarchical pattern can be seen. Damba (4.67) shows up as a height on the zone of positive residuals, while Furifuri (2.97) Bungudu (1.57) and Ruwan Dorowa (2.87) in one axis; and Wazoji (0.57) Mada (0.97) and Yar Dotun Daji (0.42), are shown as the "islands" on the zone of negative residuals.

Surfaces of agricultural development (Figs. 42, 43 and 44) do not show any concentric pattern around Gusau. Neither the radial pattern nor the hierarchical pattern is indicated. The individual scores of the villages on these indices are such that only the distinction between the positive and negative residuals make any sense. The contours therefore merely separate areas of positive from those of negative residuals. The pattern that emerged shows bands of positive or negative residuals.

The percentage increase in farm holdings surface (Fig. 42) shows that hardly did respondents in areas close to Gusau increase their farm holdings. Beyond this zone comes the strip where most respondents increased their farm holdings still further away are isolated

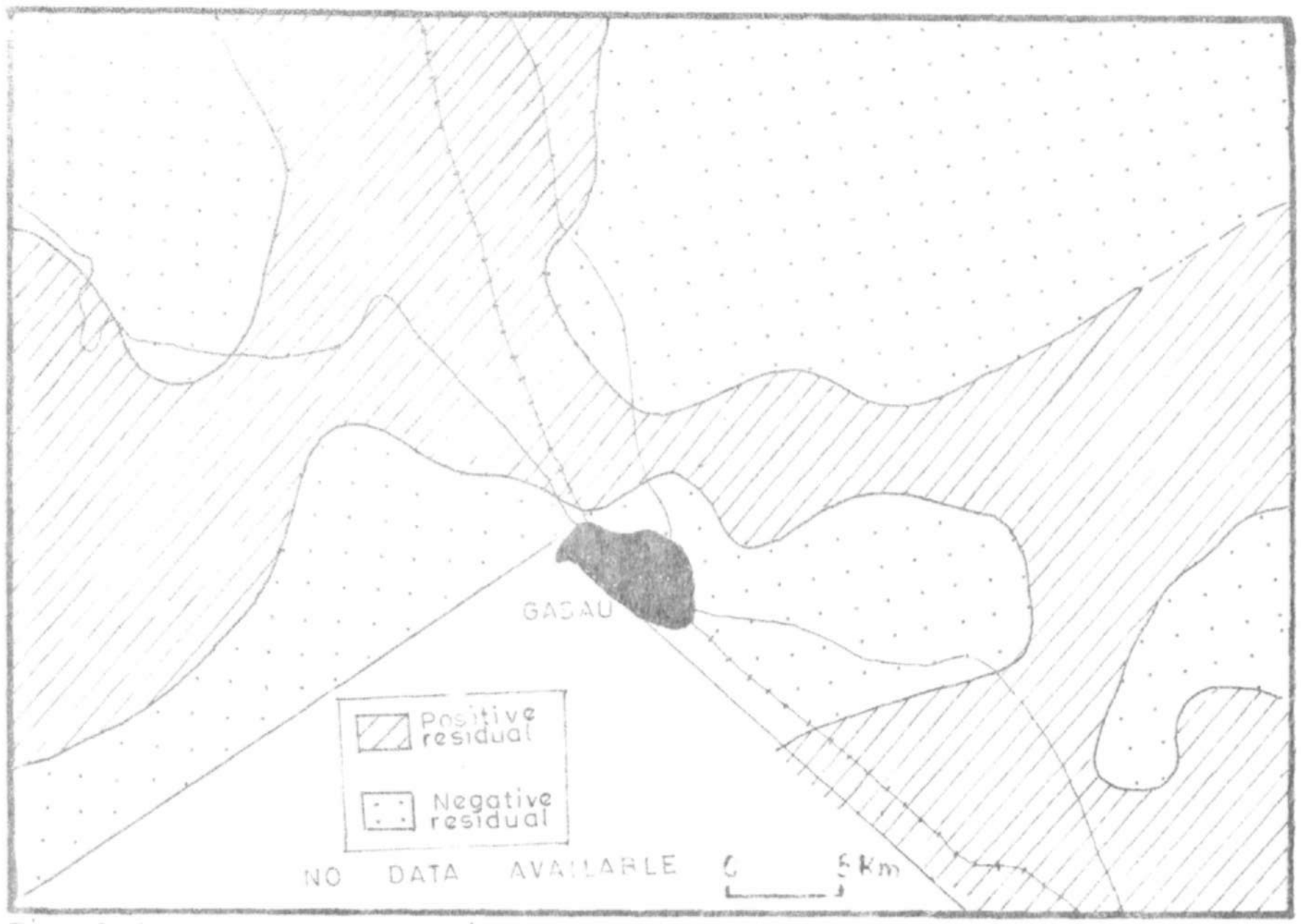


Fig.42: The surface of % increase in farm holdings

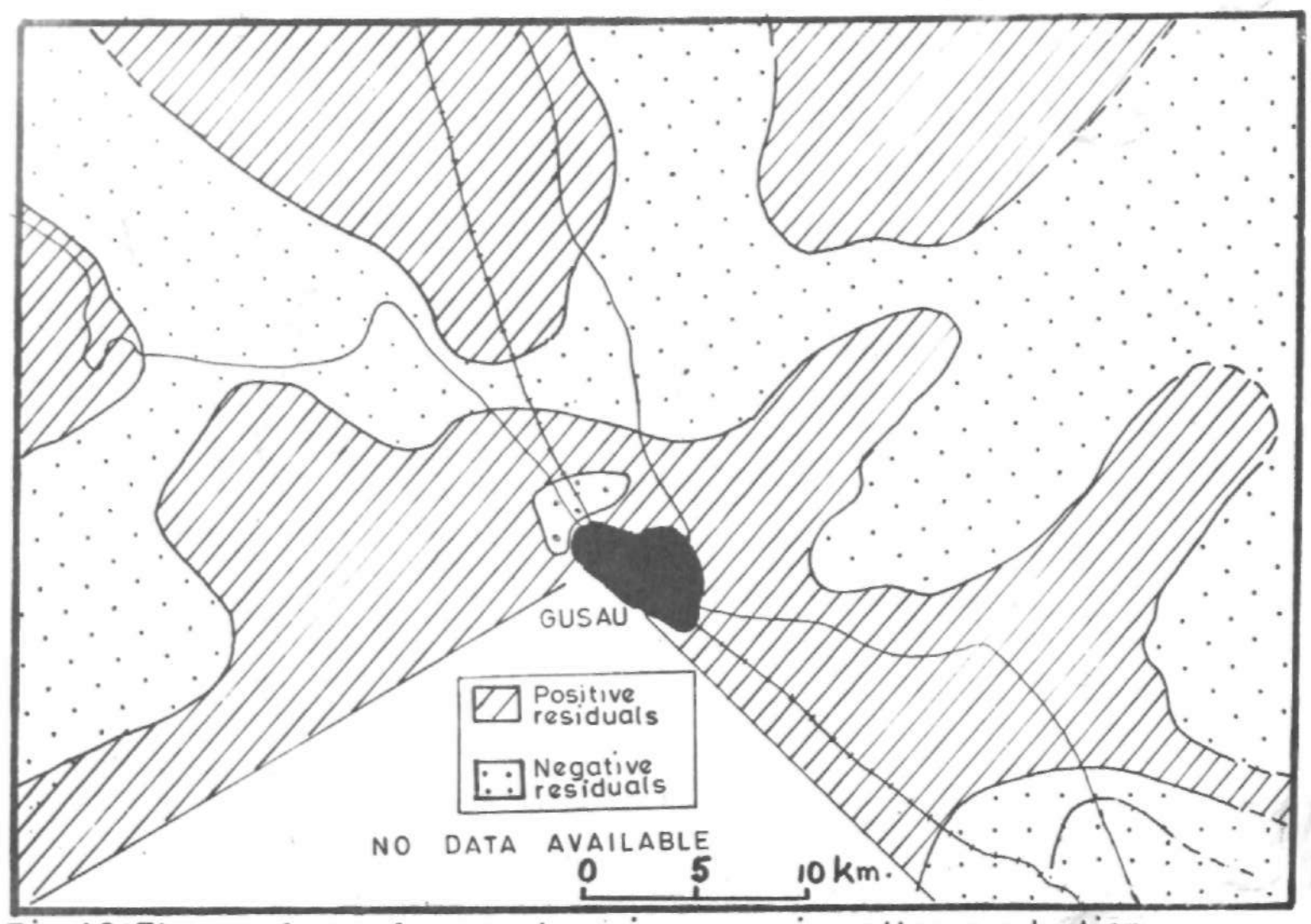


Fig. 43: The surface of percentage increase in cotton production

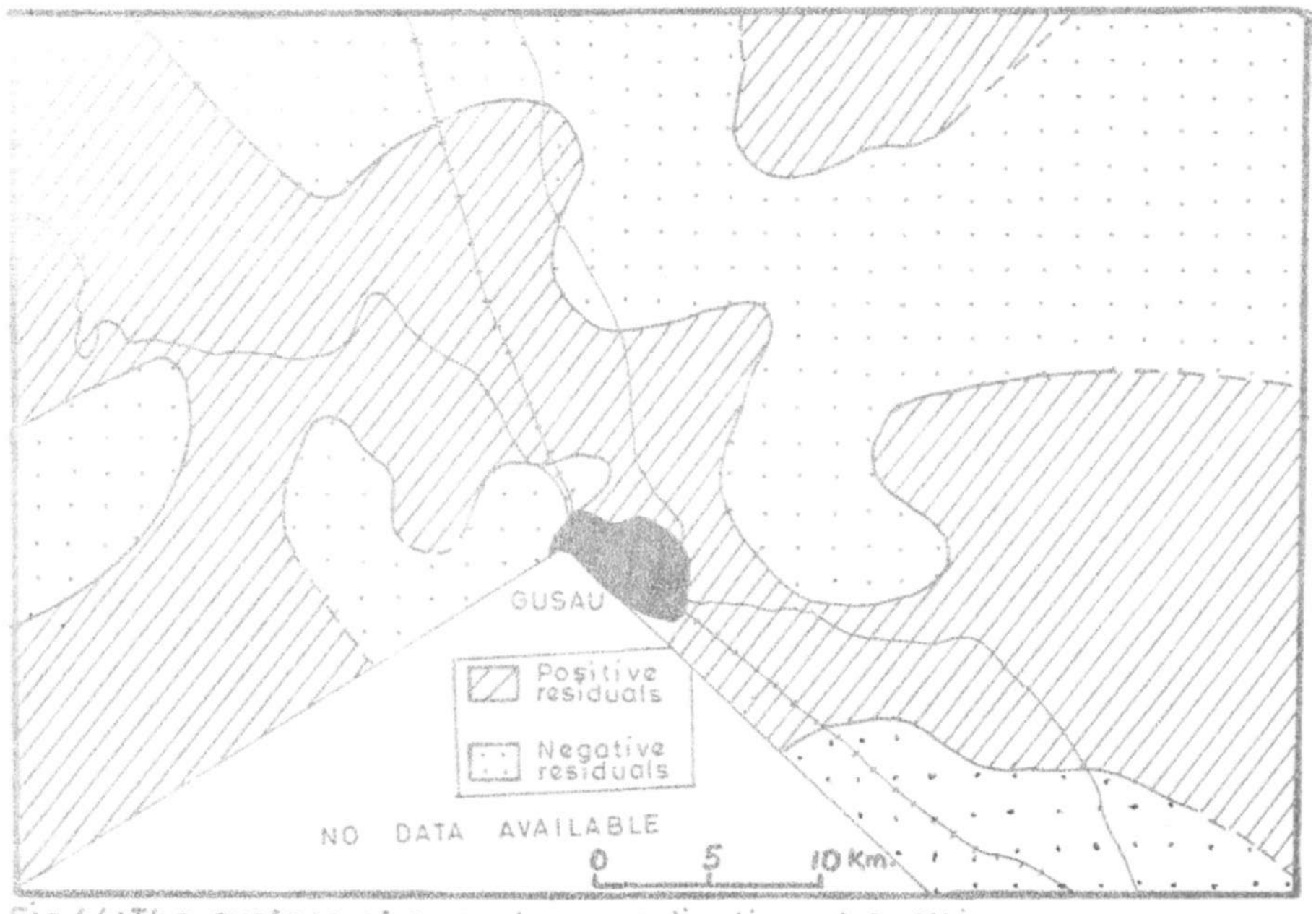


Fig.44:The surface of percentage application of fertilizer

portions where the map shows very little increase in farm holdings. For reasons already explained in the previous section, this is to be expected.

The surface of the percentage increase in cotton production (Fig. 43) shows that areas close to Gusau have increased cotton production. A few villages northwest of Gusau deviate from this general trend. Aberma, where vegetable production predominates, Mahuta and Jenyau specializing in cattle trade, show a low on this variable. North of this zone of positive increase is a band where the increase in cotton production is below the average for the growth space.

Beyond this band are localized areas of above average increase in cotton production, such as Ruwan Dorowa; Nahuche/Belawa/Rumji axis; and Dogon Kade/Rututu axis. A comparison of Fig. 42 and Fig. 43 suggests that the increase in cotton production close to Gusau was achieved either through intensive methods of cotton growing or through the displacement of other crops by cotton, for example groundnut, and not through the allocation of new farm land to cotton growing. It would also suggest that in the areas that have above average increase in farm holdings, the reason for such increase might be for the growing of food crops (O.F.N. campaign) and not necessarily for the increas e in cotton production.

Percentage application of fertilizer produced a surface (Fig. 44) which appears to emphasize the importance of accessibility.

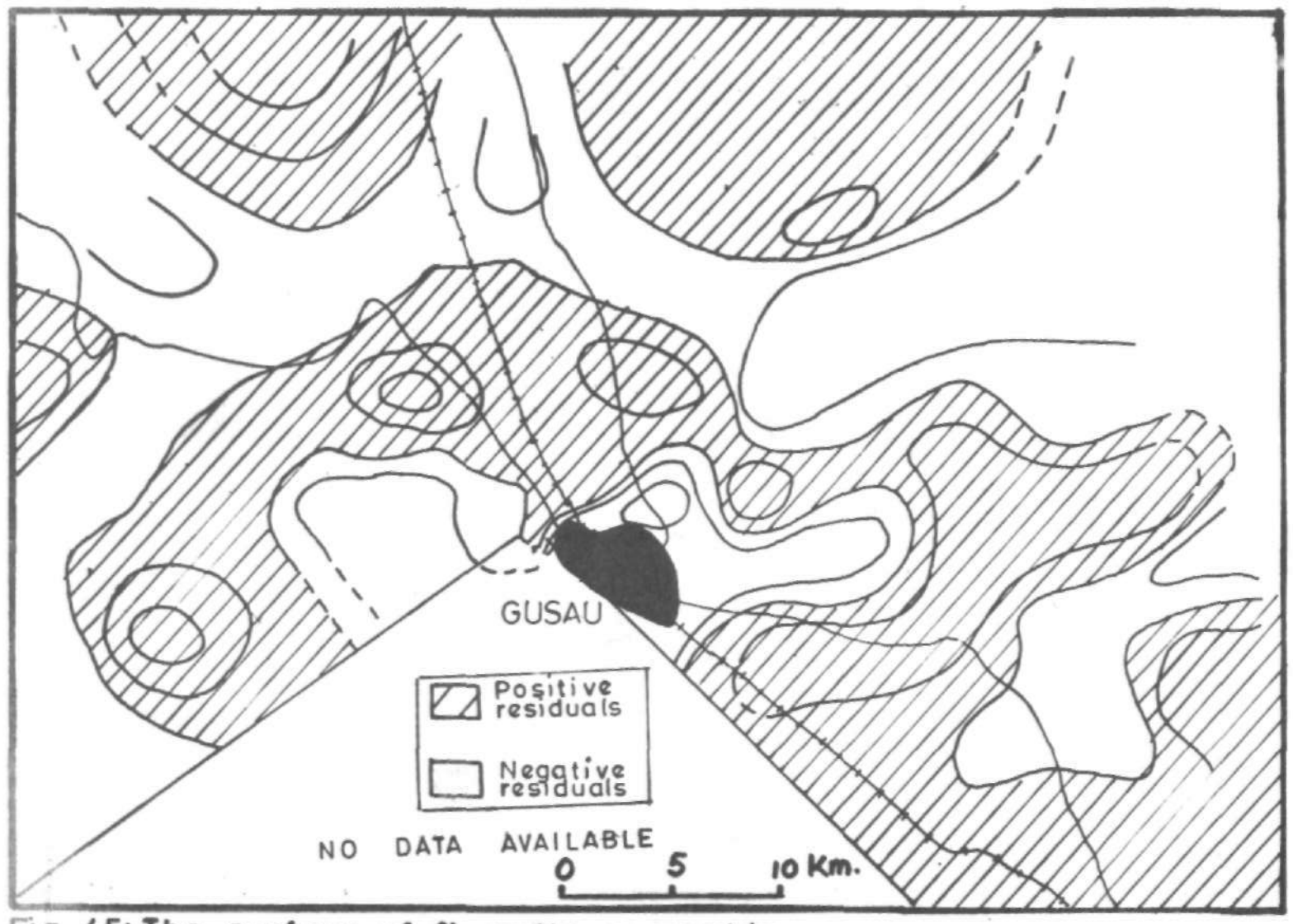


Fig. 45: The surface of % radio ownership

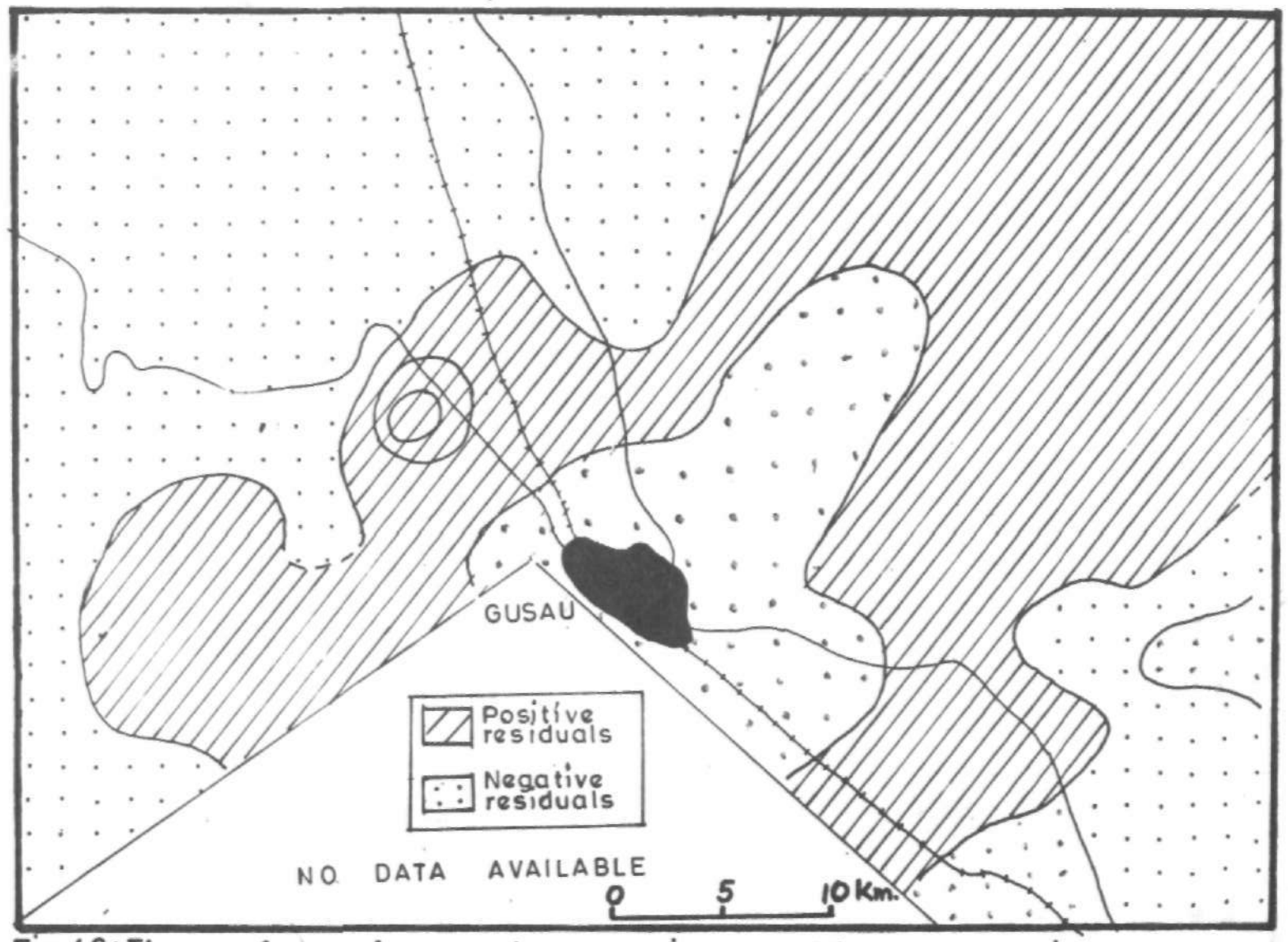


Fig.46: The surface of percentage sewing machine ownership

While the areas of positive residuals seem to follow the main access routes, the greater part of the zone of negative residuals lie in remote areas much more removed from the roads.

The two surfaces for radio and sewing machine ownership (Figs. 45 and 46), show almost the same pattern of alternating zones of negative and positive residuals. The low zone of sewing machine ownership surrounding Gusau in Fig. 46 has already been explained. Next to it is the zone of above average ownership, starting from the contour line 0.0 which marks the line of minimal effects of the competition. Beyond this zone, sewing machine ownership declines as one gets into remoter areas.

Derivation of the development surface

We have examined the selected variables and produced surfaces based on them; but the "evaluation of a development response surface implies a unidimensional ratio - or interval-scale against which the level of development at particular points in the growth space can be assessed" (Robinson and Salih 1971, p. 305). The task therefore is to select from the eight indices the ones that will best give expression to the development surface and to find a way of combining them to have a unidimensional scale with which to measure the level of development.

Table 27 shows the correlation analysis of the 8 dependent variables with the independent variable - distance from Gusau. Variables 1, 2 and 3 give negative correlation coefficients and significance levels well above the normal 95%. They are therefore

to be taken as highly relevant variables in our search for a response surface resulting from the growth stimuli generated by the growth centre. Variable 4 produced a positive correlation coefficient and the others give significance levels below the normal 95% as well.

Development levels will therefore be expressed by a combination of the three relevant indices identified above. "Since there is no formal theoretical basis for the combination of such indices into one" (Robinson and Salih, 1971, p. 305), the mean of the deviations from the mean on the three indices for each of the 42 sample villages was then computed (Table 29) and mapped to provide the development surface for the growth space (Fig. 47).

A concentric pattern of development levels decreasing in value as one moves away from the growth centre is revealed. Taking the contour line '0.0' as the boundary, the areas of predominant spread effects are limited to about 10 to 13 kilometers radius of Gusau. The boundary of this zone is of course distorted by the main access routes. For example, the projection southeast follows the Gusau-Zaria road for some 17 kilometers, a little way beyond Kotorkoshi.

Besides the concentric zonation and the radial pattern caused by the roads, isolated 'peaks' and 'islands' representing the main 'rural growth centres' of the growth space are also revealed. Among these rural centres are Yar Dotun Daji, Mada, Dogon Kade, Belawa, Furifuri, Bungudu and Ruwan Dorowa.

Table 29: Mean of deviations from the mean of the 3 selected indices for the 42 sample villages

Villages	X & Y Coordinates	Mean of mean score
01 Furifuri	1618	3.51
02 Jenyau	2214	0.27
03 Kadusa	0603	-2.37
04 Marke	4305	-1.54
05 Nahuche	1229	-1.97
06 Dogon Kade	3224	0.09
07 Mada	4608	1.83
08 Ruwan Bore	4414	-1.61
09 Runji	1921	-1.06
10 Tofa	3616	-0.81
11 Raiwaya	2618	1.17
12 Gidan Dan Giwa	2914	2.06
13 Yar Dotun Daji	4202	2.33
14 Gada	0822	-1.74
15 Kotorkoshi	3709	0.75
16 Rututu	2527	-1.91
17 Gidan Gyare	3017	-1.08
18 Gidan Maharazu	2613	2.03
19 Mareri	2710	2.23
20 Ruwan Dorowa	0218	0.53
21 Kekunwaje	0709	-1.37
22 Belawa	2026	1.07
23 Jinirawa	3722	-1.99
24 Bungudu	1321	0.54
25 Kubi	0913	-1.68
26 Ribe	3312	-0.81
27 Mamula	2423	-0.74
28 Tsuna	4712	-2.18
29 Aberma	2013	1.68
30 Tizame	4005	-0.57
31 Karazau	3304	1.66
32 Samawa	3222	-0.79
33 Wazoji	3319	-0.04
34 Danmagari	0315	-0.64
35 Danba	3009	2.79
36 Mahuta	2114	8.06
37 Barnawa	3127	-2.45
38 Shonori	4506	-2.08
39 Gidan Usman	1314	-1.71
40 Mazozawa	1714	-1.42
41 Gidan Ali	1916	-0.82
42 Ungwan Jaki	4109	-1.28

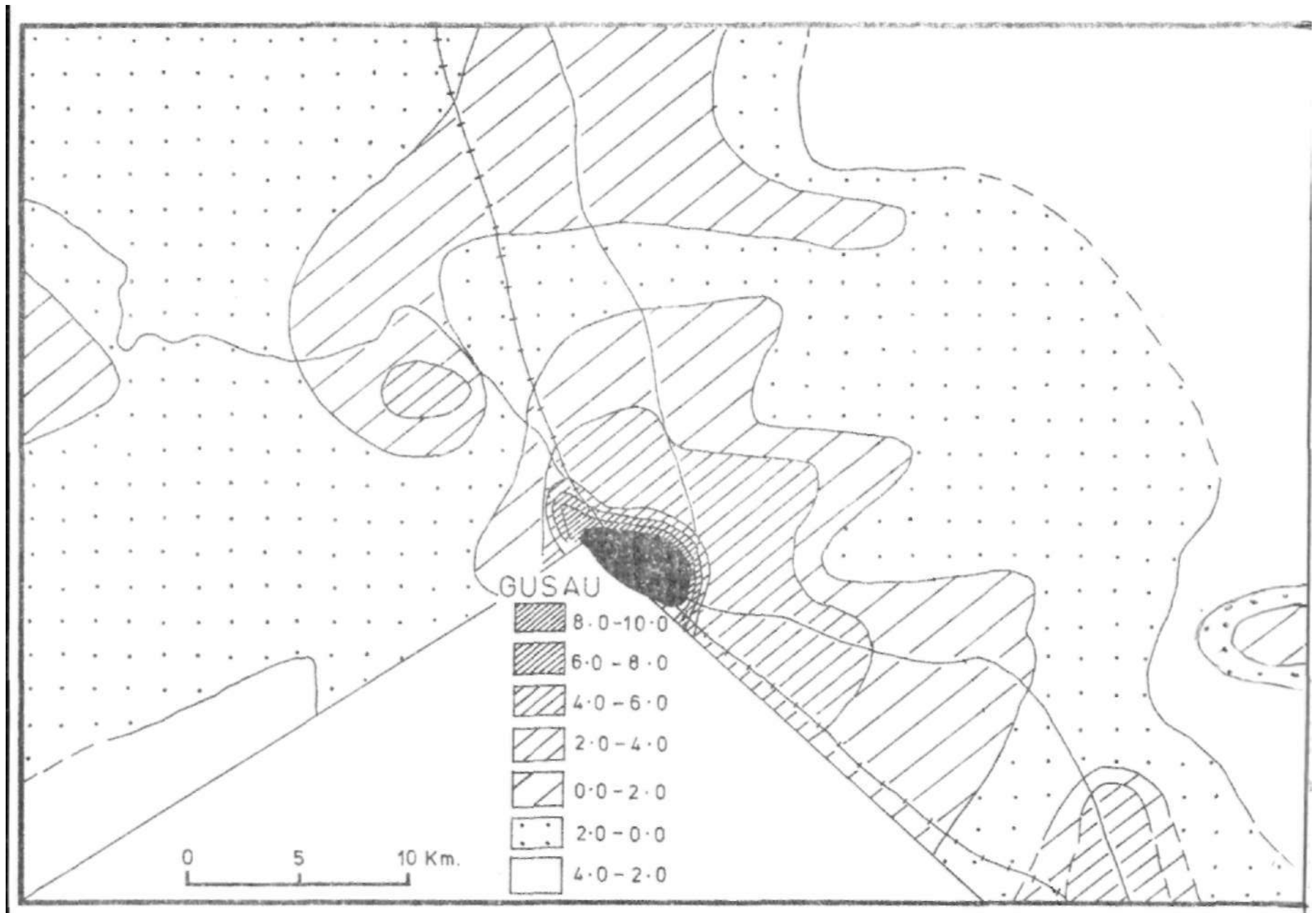


FIG. 47: GUSAU REGION: DEVELOPMENT SURFACE

Discussion

Recalling our original hypothesis and Friedmann's (1966) suggestion of the typical product of the interaction of the forces of spread and backwash discussed in Chapter 1, let us in this discussion consider the degree to which these have been validated.

Our analysis in this chapter seem to suggest that there did indeed exist a development surface, relating to a number of measures of prosperity and economic development. Fig. 47 shows the growth space as consisting of broadly concentric zones of development levels decreasing outwards from Gusau. However it cannot be said that there was only one such surface: measures of agricultural development were unrelated to this surface identified. Certain priced possessions also produced surfaces which differ from the above.

Friedman's ideas of the "upward" and "downward transitional areas" seem also to be applicable to the development surface. On Fig. 47 all zones of positive residuals can be regarded as the "upward transitional areas" while the zones of negative residuals may be regarded as "downward transitional areas". The boundary between these two is marked by the contour line "0.0".

The spatial extent of the "upward transitional areas" where spread effects predominates, however, remains small confined to some 10-13 kilometers radius of the growth centre, except where accessibility pushes it further outwards. More remote areas remain largely immune to any effective development impulses and at much lower levels

of personal prosperity. There therefore seems to be some measure of agreement here with Weinand's (1969) suggestion that in Nigeria "zones of predominant spread may nest within wider expanses of backwash" (in Moseley 1972, p. 59).

Finally within the "downward transitional areas"are 'local growth centres'. The effects of these 'local centres' in reducing regional disparities should not be neglected.

CHAPTER FIVE

CONCLUSION AND SOME IMPLICATIONS OF FINDINGS FOR SUB-REGIONAL PLANNING

From our analysis of both the spatial dynamics of growth centre - growth space interactions and the spatial pattern of development around Gusau, a number of conclusions appear tenable:

(1) That there exists around the growth centre of Gusau, a zone of predominant spread effects, but that this zone nests within wider expanses of backwash;

(2) That the spread of development from Gusau correlates positively with the factor of accessibility;

(3) That the purchase of foodstuffs and industrial raw materials, and the diffusion of innovations constitute the main machanisms of this spread of development from the growth centre;

(4) That growth centre impact through direct employment does not so much benefit the rural areas of Gusau because of substantial leakages to other regions.

Given the regional policy objectives of raising income per capita and especially real income and purcahsing power; increasing productivity per capita and per unit area; fostering the diffusion of certain innovations; and the provision of health, education and welfare services for the whole of the growth space, a number of suggestions can therefore be put forward for a growth centre strategy.

Firstly, growth centre firms should be more regionally based. Only three of the seven growth centre firms considered, were found to

be making use of raw materials obtained from the growth space. It is also interesting to note that none of the growth centre firms had any distribution agent located within the growth space. Greater opportunity for income and employment would be created if growth centre firms are more regionally oriented in terms of purchase of raw materials and employment of labour.

Secondly, there is need for the intensification of educational efforts to give the rural population a greater chance of availing themselves of the direct employment opportunities created by the growth centre firms. The low proportion of migrants from the growth space in the industrial work force of Gusau and the fact that these rural migrants belong to the lowest category of workers can be attributed to the low level of education in the growth space.

Thirdly, since the development of growth centres has been seen to exert certain pressures on the agricultural sector (in the sense that greater demand for agricultural production is generated while at the same time virile labour is attracted away from it), policy makers should realize the need to modernize agriculture to make it better able to cope. Without the increase in productivity in the agricultural sector fostered by effective regional policy, balanced development will not be achieved.

Fourthly, peripheral areas beyond the reach of the spread effects emanating from the growth centre should be provided with a minimum of infrastructural facilities and social services. A network of feeder

roads should link all places in the growth space. Indeed, the regional space must be so arranged that every producer is "within convenient travel time of some adequately competitive selling place for his produce, some equally competitive source of consumers' and producers' goods and some adequately diversified service centre" (Johnson 1970, p. 41).

Fifthly, migration to central places of lower order in the growth space should be promoted. These places should be pre-designed for the location of agro-allied industries which in turn may induce further investment.

Finally, as Moseley (1972) rightly observed, public intervention has been included as one form of spread mechanism. Government should, perticularly in the developing regions, take very deliberate and effective action to promote the spread of development from growth centres. "For the growth pole strategy to achieve the objective of regional economic development there must be a high degree of deliberateness in the planning programme for the sequential location of economic activities" (Mabogunje, 1971, p. 70). Such deliberate action may include taking an inventory of the resources of the region and efforts towards the attraction of investors; requiring growth centre firms to buy locally produced raw materials if local suppliers were being consistently overlooked by them; increasing local recruitment of labour; other measures might include the identification and building up of certain rural growth centres and investment on feeder roads construction to link up all settlements in the growth space.

A conceptualized sub-regional development policy for Gusau region based on the findings of this research therefore involves a re-ordering of all the settlements in the growth space to reflect a four-tier hierarchical pattern. This will consist of one major sub-regional growth centre, Gusua; a number of rural growth centres - for instance such places like Mada, Kotorkoshi, Dogon Kade, Nahuche, Bungudu and Ruwan Dorowa; other rural service centres comprising places like Kekunwaje, Furifuri, Belawa, Raiwaya, Wazoji, Tofa, Ruwan Bore, Damba, Karazau and Yar Dotun Daji; and at the base of this arrangement are the villages, hamlets and other rural production units, (Fig. 48).

While the sub-regional growth centre should remain the main centre for large scale manufacturing industries and the main market for the sub-region, the rural growth centres should be designed to serve as subsidiary growth points through the location of medium sized agricultural processing firms and provision of amenities. Post-primary schools and health centres should be sited in such places. The rural service centres should be the main centres from where the rural areas will be stimulated to increase their economic activity and productivity. They should therefore be the local markets for the sale of the agricultural produce of surrounding rural communities and for the distribution of urban consumer goods, farm inputs and farm implements. These rural service centres should also be the main centres for the organization of farm cooperatives. Basic facilities such as dispensaries and primary schools should of course be adequately provided for every rural service centre.

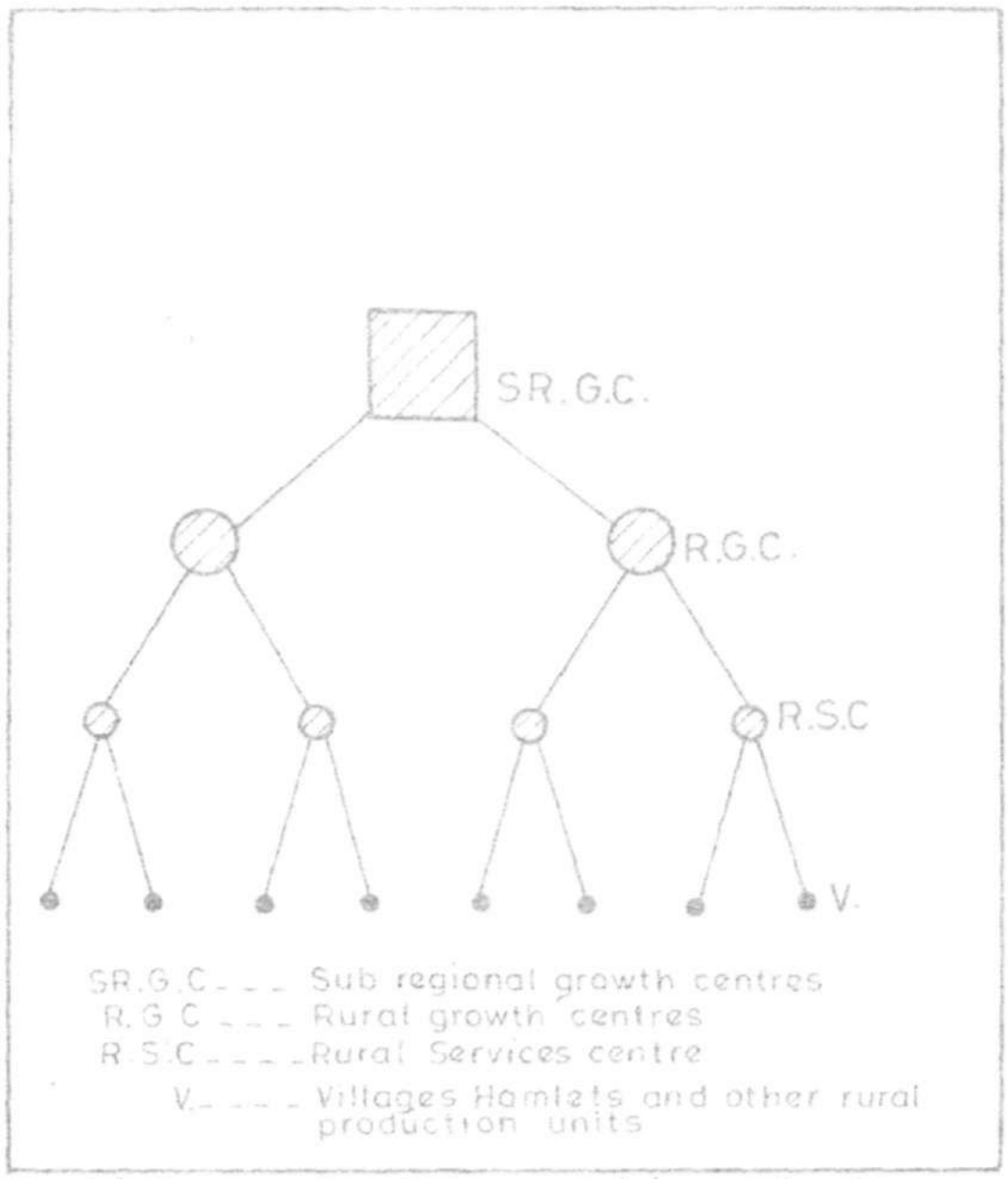


Fig.48:Proposed settlement hierarchy for Gusau sub-region

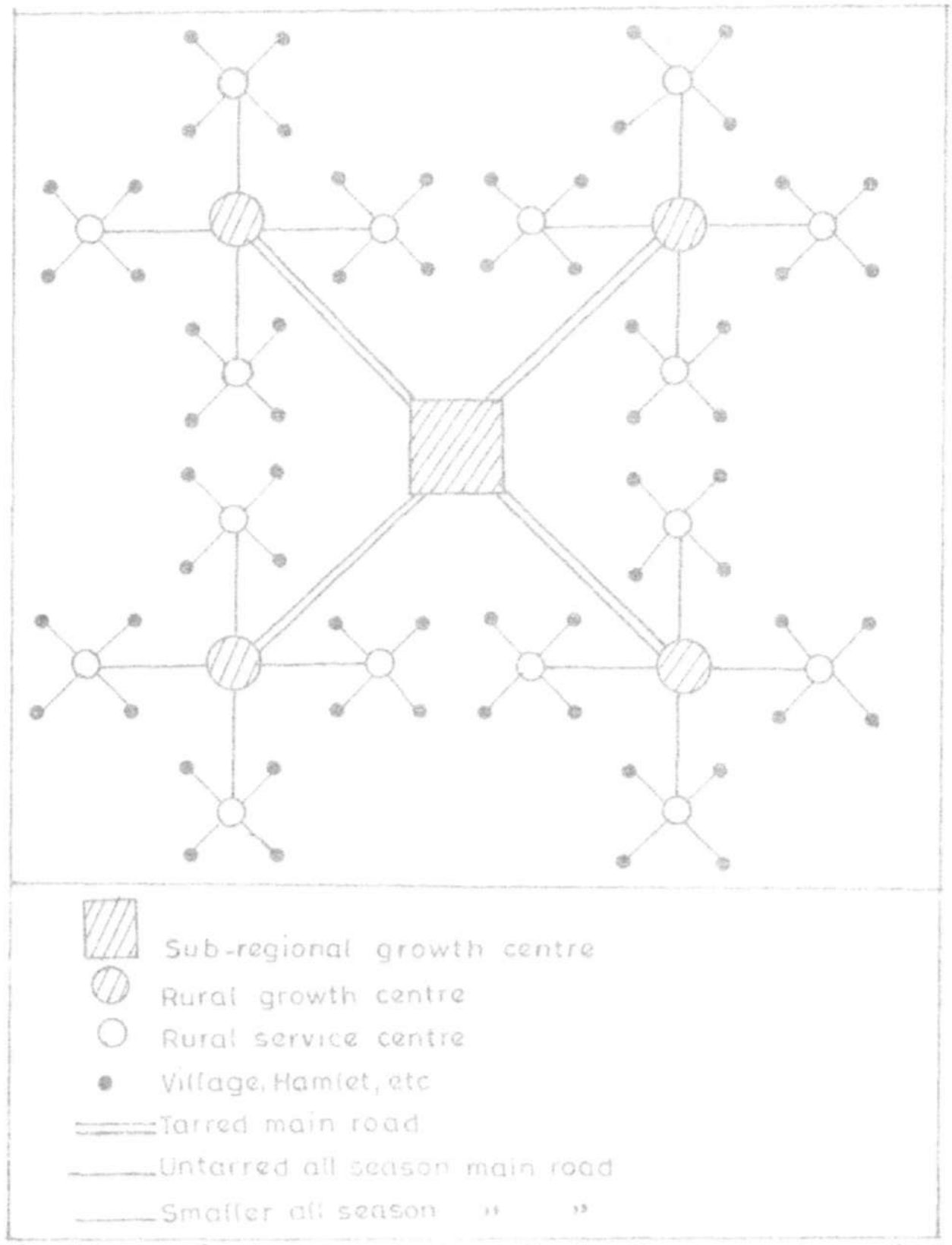


Fig. 49: Idealized network of roads for Gusau sub-region

The agricultural programme envisaged for the sub-regional development plan should aim at raising productivity through the provision of necessary inputs (improved seeds, fertilizers, pesticides etc); the supply of improved farm implements (ploughs, tractors etc); and the operation of an agricultural credit scheme which can be obtained through properly organized cooperative societies. The agricultural development programme should be centrally administered from the sub-regional growth centre (Gusau) with the rural growth centres constituting the main "development centres" from where specific decisions and actions should be taken. At the base of this administrative hierarchy should be the service centres where the warehouses, storage facilities and extension services should be located.

A properly designed sub-regional transport network for the area should be given priority, for as E.A. Johnson rightly pointed out, a good "road system can become a unifying instrumentality that consolidates the productive power of an area and releases a latent social dynamism" (Johnson, 1970, p.24). An idealized road and feeder road system for the Gusau sub-region is shown in Fig. 49. It is proposed that Gusau be linked with all the rural growth centres by a system of tarred main roads. The rural growth centres, in turn should be linked with all their surrounding rural service centres by untarred all season roads and each rural service centre should also be linked with its hinterland by other smaller all season roads (Fig. 49).

Considering the preceeding discussions and in view of the

importance of industrial growth centres in the economic growth of developing regions, maintenance of their viability should be regarded as the primary aim of regional policy. But the increasing disparities in development between these centres and their peripheries make it evident that the spatial organization of the economy cannot be left to the autonomous action of the market mechanism alone. The logical implication for policy created by the powerful "backwash effects" is that any growth centre strategy must devise mechanisms for stimulating strong "spread effects" while at the same time cushioning the effects of backwash forces. It is important that regional policy should promote the centrifugal dissemination of innovation and linkage effects from the core areas of investment to rural areas.

There is need for an integrated spatial system of urban centres arranged in a hierarchy (Johnson, 1970; Moseley, 1974; Ajaegbu, 1976, and Gana 1977). Individual growth centres cannot provide all the answers. In most regional planning situations there will be the need for major regional centres with the greatest potential for attracting new investments, new ideas and new people from other regions; smaller centres providing employment opportunities in more peripheral areas; and local centres performing a service function. Each type of centre will have its own role to play in the process of development. It is important to emphasize that the industrialization of the smaller urban centres is as crucial as that of the regional growth centre. Small or medium sized industries which may be set up at these smaller

centres may concentrate on processing of agricultural raw materials and foodstuffs.

Finally, growth centre strategies would be more effective if they are conceived as integral parts of comprehensive regional development policies. Regional Planning should aim at creating an interlinked and functionally integrated spatial economic system which would facilitate dynamic interaction within the region, so as to generate growth and development.

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APPENDIX 1A

SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION
QUESTIONNAIRE A - PARTICULARS OF VILLAGE

1. Name of Village _____
2. Estimated population _____
3. Distance of village from Gusau _____mls/km
4. Accessibility from Gusau - linked with Gusau by:

(a) Motorable	(i)	Trunk A road	☐
	(ii)	" B "	☐ (Tick one
	(iii)	Untarred all season road	☐
	(iv)	" dry season road	☐
(b) Non Motorable	(v)	Untarred tracks	☐
	(vi)	Pathways only	☐

5. Cost of transport to Gusau _____

(a)	Less than 20k	☐
(b)	Between 20k and 30k	☐
(c)	" 30k and 40k	☐ (Tick)
(d)	" 40k and 50k	☐
(e)	Above 50k but not more than ₦1.00	☐
(f)	Above ₦1.00	☐

6. Around when was the first cement walled or corrugated iron roofed house built in this village _____
7. How many such ouses were there in that year? _____.
8. How many such houses are there now (March 1977) _____

9. Schools in the village

	Type of School	No.	Date(s) started
(a)	Primary		
(b)	Post Primary		
(c)	Any others		

10. Health Centres, Clinics and Dispensaries in the village

	Type	Date established
(a)	Health Centre	
(b)	Clinic	
(c)	Dispensary	
(d)	Others	

11. Water supply to the village

	Type	Date started
(a)	Wells	
(b)	Pipe borne	
(c)	Any other (specify)	

12. No. of retail shops in the village _____

13. Types of goods sold in the shops and sources of supply

	Type of goods	Source of supply
1		
2		
3		
4		
5		
6		

14. Community self-help projects: please specify

	Project	Date initiated	Who initiated the project (a) Villagers (b) Town dwellers (c) Govt. (d) others
(a)	Road Construction		
(b)	Culvert/bridge building		
(c)	Market Construction		
(d)	Construction of civic centre		
(e)	Water supply		
(f)			
(g)			
(h)			
(i)			

APPENDIX 1B

SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION QUESTIONNAIRE B - RESPONDENT IN THE RURAL AREAS (Household Heads)

1. Is this your birth place? [Yes/] [No/] (Tick one)

2. If answer to question 1 is no please state your birth place

_____ Village _____Local Govt. Area _____State

3. How many persons are there in your household? _____

4. How many persons have left this household for another place within the last 5 years _____

5. Where did he/she/they go? (a) _____
(b) _____
(c) _____
(d) _____

6. What work are they doing there at present?
(a) _____
(b) _____
(c) _____
(d) _____

7. Have you ever visited Gusau? [Yes/] [No/] (Tick)

8. Please specify the purpose(s) of your visit(s)
(a) _____
(b) _____
(c) _____
(d) _____

9. How often do you visit Gusau?
(a) Almost every day
(b) 2-3 times a week
(c) Once a week
(d) Fortnightly

[ ] [ ] [ ] [ ] (tick)

(e) Once a month ☐
(f) About twice in a year ☐ (Tick)
(g) Any other (specify) ☐

10 What goods and services do you obtain from Gusau?

_____
_____
_____
_____

11. What other towns do you visit?

(a) _____
(b) _____
(c) _____
(d) _____
(e) _____

12. Please specify the purpose(s) of your visit(s) to such other towns

(a) _____
(b) _____
(c) _____
(d) _____

13. How often do you visit such other towns?

(a) Almost everyday ☐
(b) 2-3 times a week ☐
(c) Once a week ☐ (Tick)
(d) Fortnightly ☐
(e) Once a month ☐
(f) About twice in a year ☐
(g) Any other (specify) ☐

14. What is the size of your farm holding this year? _____

15. What was the size last year? _____

16. Have you increased or decreased your holding within the last 5 years? [Increased/] [Decreased/] (Tick)

17. Why did you increase/decrease your holding?

_____

_____

_____

_____

18. Do you use the ox-plough for your farm? [Yes/] [No/]

19. If answer to 18 is yes when did you start using it? _____

20. Where did you buy the ox-plough? _____.

21. Have you tractor hiring service here? [Yes/] [No/] (Tick)

22. If answer to 21 is yes when was it introduced into this village?____

23. Did you use fertilizer in your farm this year? [Yes/] [No/] (Tick)

24. When did you start using fertilizer?_____

25. Where do you normally buy your fertilizer?_____

26. Where do you usually sell your produce?

(a) Cotton _____ _____ _____

(b) Groundnut _____ _____ _____

(c) Food crops _____ _____ _____

27. Did you get any loan to invest in your farm last year?

[Yes/] [No/] (Tick)

28. What is the source of this loan?_____

29. Please specify what you used this loan for

_____

_____

_____

_____

30 (a) Please fill out the following table showing your farm yield for last year and this year.

Produce	Quantity obtained last year	Price per Unit measure	Revenue	Quantity obtained this year	Price per Unit measure	Revenue
(a) Cotton						
(b) Groundnut						
(c) Guinea Corn						
(d) Rice						
(e) Tobacco						
(f) Sugar cane						
(g) Millet						
Others						

30 (b) Please state any other source of income you have for last year and this year

	Source last year	How much made	Source this year	How much. made

31. Please indicate which of the following articles you own in this household, where you obtained it and when obtained.

Article	No. in the household	Date obtained	Where obtained
(a) Bicycle			
(b) Motorcycle			
(c) Radio/Casset Player			
(d) Sewing machine			
(e) Car/Motor vehicle			

APPENDIX 1C

SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION QUESTIONNAIRE C - INDUSTRIAL SURVEY OF GUSAU

1. Name of establishment _____

2. Date started _____

3. Size of establishment:

   (a) Initial capital _____

   (b) Present capital _____

4. Products:

Items	Qty produced last year (tons or Kg)	Selling price per unit measure

5. Links with other firms/contractors within the Gusau Region

Firm/Contractor	Type of link

6. What is the labour force of this establishment? _____

7. Distribution of the labour force according to skills and state of origin.

Table

Skill	Total No	Median income range	No. from the Gusau Region	1	2	3	4	5	6	7	8	9	10	11	12	13-20
Managerial																
Other Senior Staff																
Intermediate & Junior Staff																
Unskilled Labourers and Messengers																

Key to States:

(1) Sokoto State (6) Kano State (11) Gongola State (16) Kwara State
(2) Niger " (7) Bauchi State (12) Borno " (17) Ogun "
(3) Kaduna " (8) Plateau State (13) Benue " (18) Oyo "
(4) Lagos " (9) Ondo State (14) Bendel " (19) Cross River State
(5) Anambra " (10) Imo State (15) Rivers " (20) Non-Nigerian

8. Main materials used in the production of your marketed items.
Please give details using last years figures.

(a) Material 1 .....

Sources I	Qty obtained from this source II	% of Total III	Price per unit measure IV	Transport cost per unit measure V

(b) Material 2 _____

I	II	III	IV	V

(c) Material 3 _____

I	II	III	IV	V

(d) Material 4 _____

I	II	III	IV	V

(e) Material 5 _____

I	II	III	IV	V

9 Please specify the location of your distribution agents.

Distribution Agent	Location region (Town/Village)	Qty distributed per annum	Whole sale price per unit measure

10. How much did you realise from the sale of your products last year? Please approximate ₦_____

11. How much did you spend on the payment of salaries and other entitlements or emoluments to workers last year? Please approximate

₦_____

APPENDIX 1D

SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION QUESTIONNAIRE D - WORKERS SURVEY (To supplement the industrial survey)

1. Name of your firm?_____
2. When did you start working for this firm?_____
3. Please state your area of origin:
   _____ Local Government Area _____ State.
4. What was your previous occupation? _____
5. How much do you earn from this firm a month?_____
6. How much do you earn from any other sources of income you may have?
   _____
7. How much of your total income do you spend on local foodstuffs per month?_____
8. Where do you normally buy your major foodstuffs?

(a) From Gusau market	☐	
(b) By the roads from the villages	☐	
(c) From village markets	☐	(Tick)
(d) From the big shops	☐	
(e) Any other (specify)	☐	

9. What other items apart from food do you buy from Gusau area?

Item	Amount spent on item per month

10. How much of your total income per annum do you send home either to your people as gifts or for some projects you may have at home?
    _____

APPENDIX 1E

SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION QUESTIONNAIRE E - SURVEY OF GUSAU RESIDENTS

1. How long have you lived in Gusau?_____

2. If you were not born in Gusau please state your area of origin:

_____ Local Government Area _____ State.

3. What is your present occupation? _____

4. Whom do you work for?

(a) Government ☐
(b) Corporation/Firms ☐ (Tick)
(c) Self employed ☐
(d) Any other (specify) ☐

5. What was your previous occupation? _____

6. What is your income per month from your present occupation? _____

7. How much of your total income do you spend on local foodstuffs per month? _____

8. Where do you normally buy your major foodstuffs?

(a) From Gusau market ☐
(b) By the roads from the village ☐
(c) From village markets ☐ (Tick)
(d) From the big shops ☐
(e) Any other (specify) ☐

9. What other items apart from food do you buy from Gusau area ?

Items	Amount spent on item per month

10. How much of your total income per annum do you send home either to your people as gifts or for some projects you may have at home?

_____

APPENDIX 1F

SPATIAL IMPACT OF GROWTH CENTRES IN A DEVELOPING REGION
QUESTIONNAIRE F:- FLOW OF FOOD STUFF AND OTHER MATERIAL INTO GUSAU

1. (a) Counting Point ____ Road from _____ to _____

(b) Day _____ Date _____

(c) Sample Unit: $\frac{1}{10}$: $\frac{1}{5}$: all: (circle one)

2.

Type of Commodity	Origin Town/Village	Destination Town/Village	Quantity	Unit of measure	Price per unit measure

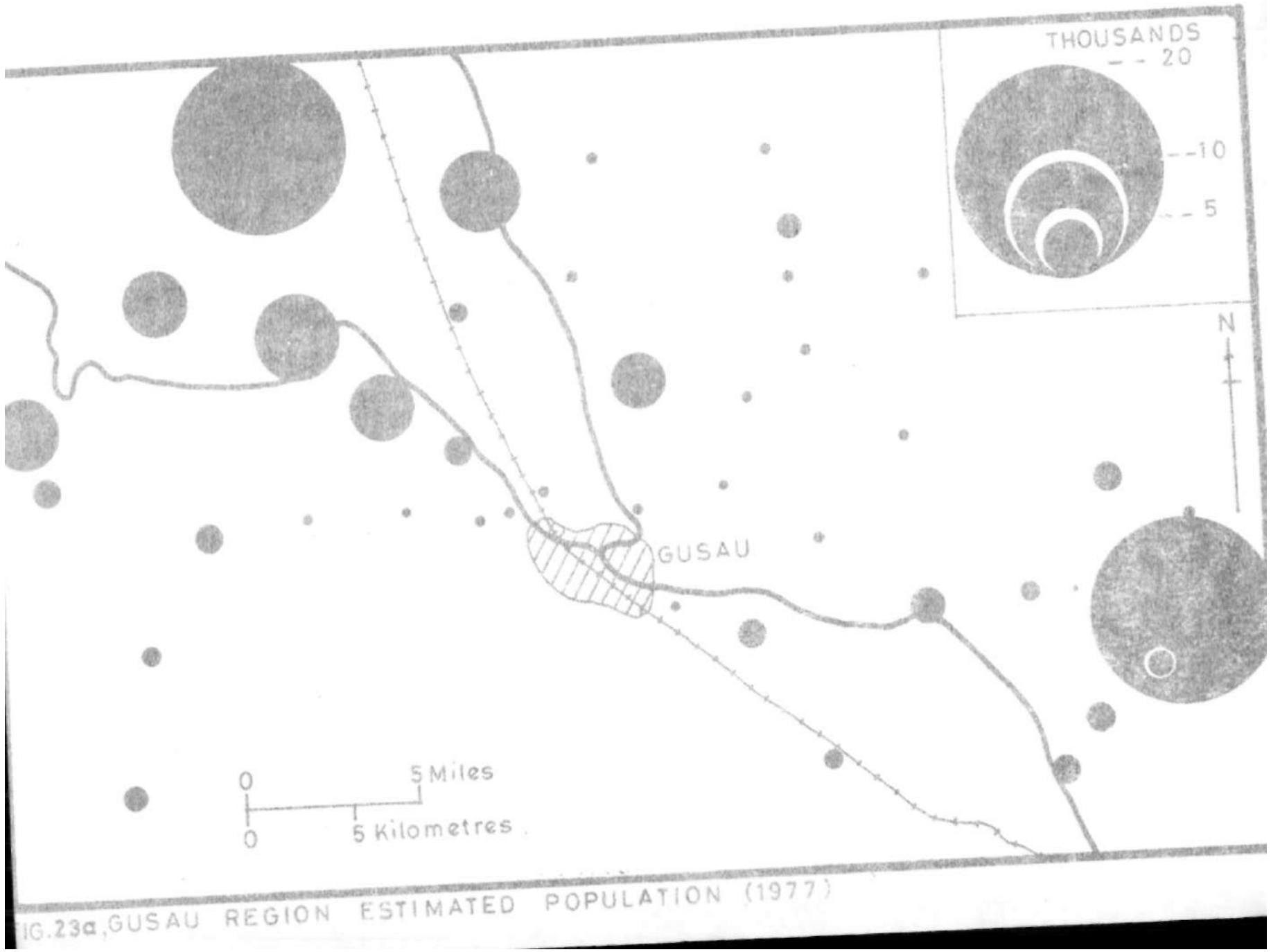
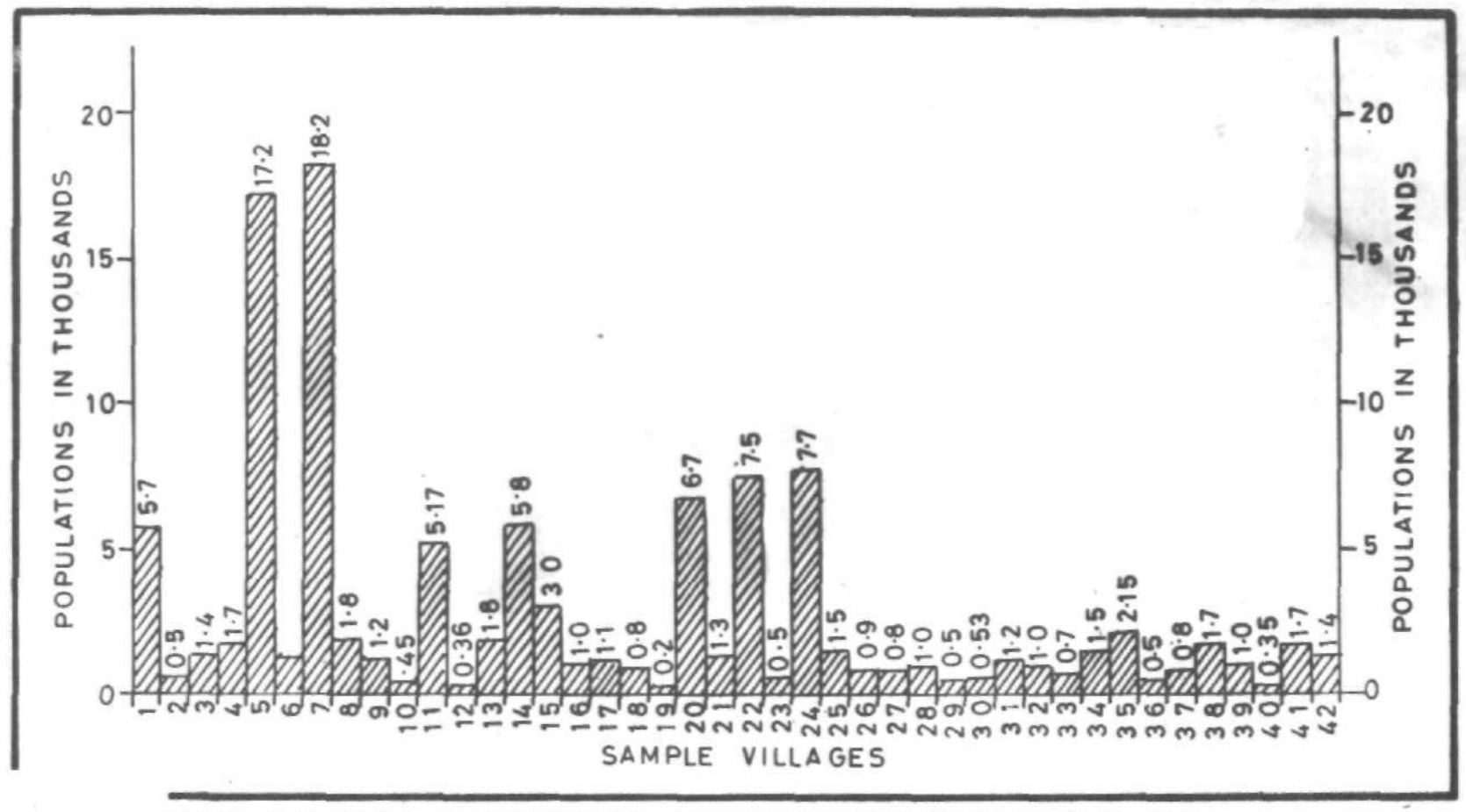


FIG.23a, GUSAU REGION ESTIMATED POPULATION (1977)



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