Dissertation

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The Spatial Structure Of Bread Market Zones In Addis Ababa.

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BY

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A B S T R A C T

The research focuses on the economic geography of the major components of the new bread marketing system introduced in 1984/85 in Addis Ababa. The major components are the bread production, consumption and transport systems.

Spatial and temporal analysis of these components, using eight hypotheses to try to achieve the researcher's objectives has been conducted using the methods outlined in Chapter II. The data employed were derived from primary sources.

The mean-field concept is used to derive an index $\mathcal{M}$ that describes consumption conditions within the bread market zones by relating aggregate volumes of haul of bread to aggregate transportation costs. The highest values for $\mathcal{M}$, suggesting zones with relatively optimal bakery and bread shops locations, are found for Kefetegnas 9,5,6,7,1 and 14. The results of the nearest neighbour index for bakeries, bread shops tend to confirm that most of these Kefetegnas approach the optimal uniform pattern. The Kefetegnas with the least favourable bread supply situations are 8, 16, 12, 17, 23, 20 and 15.

The trend in bread production capacity and bread output in the 1980's in Addis shows that the share of public bakeries has been growing more than the others, notably the private bakeries, which have declined in importance since 1982/83. Input materials for bread making are in short supply and bread supply is less than the assigned quota in most Kefetegnas.

The demand for bread in the city does not exceed the attainable capacity of existing bakeries, hence, the establishment of additional bakeries is not justified. Rather the flour mills in Addis Ababa and in Ethiopia in general need replacement/modernization.

The study found a high degree of association between the bread quota and population size on Kebele level. The amount of bread delivered to Kebeles is, however, less than indicated by Kebele population sizes.

Consumers and bakery operators were found to be very critical about the poor handling and unhygienic condition related to bread transportation from bakeries.

The researcher's attitudes survey of 440 households revealed that the upper income groups spend more on bread on annual basis, but during the wet season the low-income people spend more on bread. Bread consumption by low income consumers seems to be

mainly attributable to its low price, rather than to discriminatory quota allocations by the new distribution system.

The attitude survey revealed the general satisfaction of the city's consumers and Kebele retailers with the general operation of the new bread policy. However, most consumers (specially in the upper income bracket), Kebele officials and bakery operators were very critical of low bread quality. Low quality, however, is not due to the use of composite wheat-maize flour, which should be retained because of its import substitution effect.

The bakery operators, especially the private bakery owners, were critical of the policy in general and the supply of raw materials in particular. Most would prefer to sell their bread through their own and other private sector retail shops.

The existing bread distribution policy does not stimulate competition (Among Bakers) or quality control. The policy needs to be radically modified to reflect the changing attitudes and needs of both consumers and bakers.

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INTRODUCTION

1.1 STAGNANT CEREAL PRODUCTION AND PRICE INFLATION IN THE ADDIS ABABA CEREAL MARKET

Increasing food demand in the urban areas and insufficient food crop production in the rural areas were features of the years 1984/85 in Ethiopia. The growth rate of agricultural production in the country was +1.2 percent in 1965-1980 but -3.4 percent during the years 1980-1985 (World Bank Report, 1987, 204). Indeed since 1979, the cereal production situation has changed from one of slow growth or stagnation to one of absolute decline. Available data suggests that the growth rates of population have exceeded those of cereal output in Ethiopia for at least a generation. (Watt I., 1987, 137-140).

In the years between 1979/80 and 1986/87 national cereal production (main season) ranged between 42.4 (1984/85) and 67.2 (1982/83) million quintals, averaging 55.2 million quintals per year (CSA, 1985/86 and 1986/87). The trend in state farm cereal production was not encouraging, ranging from 1.6 million quintals (1979/80) to 3.2 (1986/87) million quintals, the annual average being 2.4 million quintals. In the case of the private peasant sector which produces some 90-95 percent of the nation's cereals, production ranged between 38 (1984/1985) million and 61.2 (1982/83) million quintals, averaging 50.1 million quintals

annually. Peasant cooperatives production ranged from 0.61 million (1980/81) to 2.03 million quintals (1986/87), averaging 1.1 million quintals yearly. National cereal production in the 1980's has thus clearly been stagnant, as has the area under cereal crops and the yields of individual cereal crops (CSA, 1985/86 and 1986/87).

As to the structure of cereal out put, the production data for 1960's indicate the dominance of barley, teff, sorghum in the nation's diet. Since the revolution there have been changes, as barley has fallen, while maize and sorghum have grown in importance. In 1983 maize constituted 28.5 percent, sorghum 21.6 percent, teff 20.6 percent, barley 15.5 percent, Wheat 10.7 percent and millet 2.7 percent of rural cereal consumption (Watt I., 1987, 147).

Since 1982, significant shortages of cereals have been observed in the Ethiopian markets. These shortages have been due to a variety of causes, ranging from backward technology, small farm sizes, environmental degradation and increased peasant consumption, to natural disasters and the problems of finding appropriate policies for the period of transition to a socialist economy. These production shortages coupled with distribution problems became very serious in the second half of 1982 (Abebe T., 1984,53) and they had become acute by 1984/85 (Mengistu W., 1986, 126) and Meskerem Vol.2, No.7, 1981, 21-24).

Changes in cereal marketing activities and the creation of new marketing institutions since the revolution may also have had negative impacts on cereal production and the supply of crops to the urban areas. For example, the AMC has used a quota purchase scheme, fixed grain prices and control of grain wholesalers as key components of it's marketing strategy (Alemayhu L., 1987, 166-167). These quotas are often imposed on Peasant Associations without comprehensive knowledge of the production levels of each association and they have in some cases forced peasants to deliver crops to the AMC, which are not produced in their fields. In addition, in spite of grain production cost variations from region to region, the AMC operates a uniform price policy that discourages regional crop specialization (Mengistu W. 1986, 106). Operational difficulties and logistics problems have also been encountered during grain collection. Taken together, these problems have complicated the supply of cereals to urban areas in recent years.

The fixed price system operated by the AMC has resulted in a big gap between the price set by the open market system and the price fixed by the government. The AMC did not provide individual peasants, Agricultural Producer Cooperatives or Peasant Associations with grain prices up to their expectations. Thus their preference has been to sell to individual consumers or store their produce, rather than

to sell to the AMC. A case study of Dejen and Wolmera districts by Mengistu, for example, indicated that peasants' sales to individual consumers were 60 percent compared with 20 percent to the AMC and 20 percent to middlemen (Mengistu W.1986, 19). As a result, the supply of cereals through urban service cooperatives, (the source for which is the AMC) especially in Addis Ababa, became very tight and since 1982 cereal prices in the open market have become very high due to shortages. For example, sales of cereals by Kebele shops in the city in 1985 totalled 1,070,307 quintals, 75 percent of the 1982 total of 1,426,052 quintals (Addis Ababa Commodity Distribution Corporation,1986). By contrast the open market prices of cereals increased and peaked in early 1985. The average annual retail price index for flour and unmilled cereals in the city indicates a price increase for all cereals of 238 percent between 1980 and 1985, while average flour prices increased by 222 percent (CSO, 1987, 166). By 1985, the open market cereal prices were 316 percent above those of the service cooperatives (Ibid). Clearly, the prices of cereals had increased beyond the buying capacity of the majority of the city population. The years 1984 to 1986 were thus times of severe food shortages and price inflation. As a result Ethiopia had to import 516,149 tons of wheat worth 79,045,020 dollars during these

years (ETIMEX, 1987). Likewise grain received by RRC and NGOs during 1984/1985 totalled 1,156,365 tons, while grain received from bilateral sources totalled 268,272 metric tons (Dejene A., 1986,11).

1.2 HOUSEHOLD INCOMES AND FOOD EXPENDITURE IN ADDIS ABABA

The major demand characteristics of the Addis Ababa population need to be treated briefly at this point. The city population has been growing at an annual average rate of 3.8 percent (CSO,1987). According to the CSO, the population of Addis Ababa in 1987 was estimated to be 1,658,704 (CSO, 1987). Many of the city's population are in very low income brackets. According to a survey made by the City Council of Addis Ababa in 1981, more than 50 percent of the then population had an average monthly income less than birr 140 (City Council, 1981). CSO estimates of 1984 indicate that, of the total households in the city, almost 78 percent had incomes less than 300 birr per month and less than 13 percent had from 300 to 600 birr per month (CSO, 1984, 6). The remainder had incomes greater than 600 birr monthly (Ibid). On the average, the monthly income of a household and a person was in the range of birr 244.4 to 249.5 and birr 48.4 to 50.8 respectively (Ibid). The household characteristics of the urban population also reveal that the low income group of the population in Addis Ababa have more children than the high income group. Thus

the household size is much greater in the low income group than in the high income bracket (Mulugeta W.A; 1986, 5).

Empirical analysis of expenditures on food in Addis Ababa show that domestic spending on food decreases as monthly family income increases. The domestic food expenditures by different salary groups (as a percentage of total expenditures) during the 1979 survey period in Addis, for example, ranged from 51.4 percent (<50 birr/month group), to 31.8 percent (>1001 birr/month group) (CSO, 1979, 31). Previous surveys eg. in 1963, 1968 and 1975, as well as later surveys (eg. 1980) show patterns similar to the 1979 survey (CSO, 1984, VI). These findings are in line with Ernest Engel's Law, which states that "the larger a family's income, the smaller the fraction spent upon food" (Stigler G.J., 1966,38). Better-off households, say >600 birr monthly income, in Addis, as indicated in the CSO surveys, spend no more than 35 percent of their income on food. By contrast the more vulnerable low income groups, earning less than 249 birr spent 50 to 60 percent of their income on food (Mulugeta W.A., 1986,6). Moreover;

> ..... Engel's law is also supported by Bebbet's Law, to which the Ethiopian urban consumption and expenditure characteristics conform, i.e. an increases in the average income level bring about changes in household diets. The (above?) average income group shifts to <u>teff</u> while the low income urban population shifts to low price maize (Ibid).

The trends in income growth and job availability for the city population also suggests that poverty has increased substantially. "In the late 1970's, poverty must have affected 55-60 percent of the population but by 1982 the proportion must have risen to at least two-thirds of all households" (JASPA/ILO, Vol.1, 1982, 242). Of the total employees in Addis Ababa in 1976, for example, 57 percent were employed for <100 birr, 14.8 percent for 100-150 birr and 28.5 percent for >150 birr (Ibid). The concentration of such large numbers at the low end of the income scale (<100 birr) indicates the presence of a great deal of urban poverty.

The number of job seekers has also been increasing rapidly in the city of Addis. The overall increase between 1978 and 1980/81, for example, was 71.3 percent for males, 45.5 percent for females and 55.2 percent for both sexes, which represent a demand for an additional 115,183 jobs between these years (Jaspa, 1982, vol.2, 14). The unemployment rate in 1978 was estimated to be 19.7 percent, with an increasing rate of unemployment since then (Ibid).

The labour force has also been increasing in the city. The labour force is estimated to have increased by 17.7 percent in 1985, from that of 1980/81. It is also estimated that between 1982 and 1990, it will increase by almost 750,000 (Ibid, 258).

Since 1975/77 to date, there has been no general upward adjustments to the range of salary scales. Government employees with salaries above birr 600 per month have received no increases, except on promotion (Ibid). All of these indicators suggest that poverty has increased since the second half of the 1970's in the city of Addis Ababa.

The problem of poverty in the city has also been influenced by the behaviour of wage rates. The minimum monthly wage in 1974/75 was 50 birr, but in 1981/82 it was 76.1 birr (152.2 percent increase). The cost of living index (1974/75 =100) however, had risen to 231.6 by 1981/82 (Derek R., 1982, 61). Likewise " the retail price index for all food items has also shown an alarming increase rising from a base of 100 (1963) to 170 in 1975 and 562.9 in 1986 " (Mulugeta W.A., 1986,3). Comparison of the trends in wage rates and consumer prices suggests that "the minimum wage earners real income between 1974/75 and 1981/82 dropped by 34 percent. The fall in their real income has pushed those on the minimum wage below the poverty line". (Jaspa, 1982, 241). It is thus reasonable to conclude that there has been a reduction in the real wages and salaries of many employees since 1975/76. (Vali J., 1982, 43).

What the writer has attempted to depict so far is that since the early 1980's the growth of crop production in rural Ethiopia has slowed down and that cereal prices in

Addis Ababa have increased faster than the incomes of city dwellers. Consequently price inflation, food shortages and hunger have affected the city's poor, especially in famine years like 1984/85.

Due to the impacts of the developments mentioned above, i.e. free market inflation, the tight supply situation in the state commercial sector, shortages of cereals, wage freeze and unemployment increase, the city population has responded by changing the composition of its diet. Since 1982/83 bread consumption has increased, imported cereals e.g rice, have grown in importance, as have processed foods (eg. pastas, flours from cereals, pulses etc). By contrast sales of teff and maize in Kebele shops have fallen, while sales of wheat have risen. The whole cereal diet has diversified (Watt I., 1987, 179).

1:3 THE GROWING IMPORTANCE OF BREAD IN ADDIS ABABA

Consumption of bread has also increased in recent years. In the 1970's only a small proportion of Addis Ababa's population consumed bread. This is partly due to tradition. Ethiopians eat Enjera and prefer it to bread. Moreover, bread was considered a luxury food item (Agriculture and Industrial Development Bank, S.C., 1974, 10). In 1971, for the then population of Addis Ababa (estimated at 890,000), the production of bread was about, 21.2 million kg., a per capita consumption (pcc) of 25 kg per year (Ibid).

Due to the perishable nature of bread and because demand fluctuated daily, production was very variable. It was thus not easy to predict daily consumption before the 1980's (Ibid). Since 1983 the production of bread in Addis Ababa has increased considerably. In 1983 production was 47.5 million kg. (34.5 kg/pcc), in 1984, 63 million kg.(44.3 kg/pcc), in 1985, 52.6 million kg (36 kg/pcc), in 1986 it was 62.5 million kg (41 kg/pcc) and by 1987 it had reached 65.1 million kg (41 kg/pcc) (Ministry of Domestic Trade, 1987). The per capita daily consumption during the period 1983-1987 ranged from 0.1 kg to 0.12 kg.

The stable price of bread during the 1980's has been in sharp contrast with the price of grains in the open market. During the drought of 1984/85 the price of cereals was beyond the buying capacity of the city's low -income people. This led to the growing trend in bread consumption. The price of 125 grams of bread has remained the same since 1980 (birr 0.10). Assuming that a person eats three pieces of bread at a time, three times in a day, he needs to spend only birr 0.75 i.e. roughly 1/4 of the cost of an equivalent amount of Enjera (a 125 grams piece of bread is birr 0.10 and a cup of tea costs birr 0.15). More than that, bread consumption does not involve the preparation costs of other traditional foods. Bread consumption was thus much higher in 1984/85 in Addis Ababa than in the 1970's.

Bread is not to be regarded as a recent innovation in Ethiopia. Breads of various kinds, such as, Enjera, Kita, Ambasha, Difo Dabo, Kocho, etc. have been baked in a traditional way for centuries. The baking industry, in the modern sense, seems to have started during the Italian occupation and by 1941 there were about 25 registered bakeries in the city (Agriculture and Industry Development Bank S.C., 1974,10). The oldest modern bakery, however, is the 'Hizbawi' or public bakery, which was established in 1950 (Higher 5 keble 12). The newest is the Mehakelawi Migib Maderaja bakery (Higher 17 kebele 24), which was established in 1987. In 1971, the total number of bakeries was 50. In 1974 there were 101 and in 1978 there were 133 (Ministry of Internal Trade, Price Control Administration, 1987). The number has grown rapidly in recent years, from 147 (1983) to 201 in 1987 (Ibid). Since 1971 the number of bakeries in Addis Ababa has increased by 402 percent.

Out of the 201 bakeries (1987), 56 are 'modern'. These are bakeries that operate with imported stoves and ovens, using electricity and are characterized by high bread production (eg. Shewa Bakery, with capacity of 1350 quintals per month; Arbegnoch Bakery with a capacity of 1170 quintals Wezador Bakery with a capacity 1080 quintals). In addition there are now 146 brick-oven bakeries; these use locally made ovens, fuelled by firewood and are characterized by

relatively small output (eg. Rashid Ahmed Mehamed Bakery with a monthly capacity of 52 quintals; Zerihun Seyoum Bakery with a capacity of 120 quintals, Newai Abebe with a capacity of 90 quintals). In addition, there are 224 tea-house bakeries spread throughout the city.

According to the size and equipment used, tea house bakeries can be classified with brick-oven bakeries. They operate with locally made materials using fire. Their baking capacity ranges is 1 to 355 quintals per month (EFC, 1985). Their total attainable capacity per month is 4538 quintals, with current production running at only 2535 quintals a month (Ibid).

Before 1985, the methods of selling and distributing bread varied from bakery to bakery in the city. The bread marketing characteristics were well described as follows:-

> ..... some bakeries deliver to customers by trucks, others distributed bread to branch shops for sale. For other cases customers might make all purchases directly from the store. The main customers of bakeries were Restaurants, Hotels, Cafeterias, Hospitals, Boarding Schools etc. During the months of Tahsas to Tir and during ceremonies and weddings, sales are at their peak, whereas the rest of the year sales decrease. (Development Bank, 1974, 11-13).

Before 1985 each bakery, together with a large number of small scale retailers, were the main distributors of bread to the city people. One of the consequences of this

distribution system was that bread was not always available close to the residences of consumers, especially at a time when there was scarcity of food. In addition poor urban consumers had to compete with retailers to get bread from bakeries. As a result they often had to buy bread from retailers at much higher prices than the actual production price (Development Bank, 1974,13).

As to the value of the availability of food shops close to consumers' residences in terms of expenses, Sporrek has to say the following:-

> Accessibility of food to the consumers is not only a question of price and income, although these are obviously important types of factors that have been widely researched, but the cost of obtaining food to the consumers is not just the money paid but also the cost interms of time, travel and disruption to other activities incurred, some of which may be income generating of reaching the supply points where various food products are sold (Sporrek A., 1985, 13).

1.4 GOVERNMENT ROLE IN BREAD MARKETING IN ADDIS ABABA

To ensure a steady flow of low-price bread to the city population the government therefore, had to intervene in the bread distribution system in 1984/85. The growing demand for bread and the mal-distribution of the available bread in the city necessitated, according to senior officials in the Ministry of Domestic Trade, the formulation and application of new bread distribution pricing and subsidy policies. The

main objective of such policies was to provide bread for all people and in particular to lessen the burden on the poorest segments of the city's population.

The steps taken to tackle the urban food problem forced the government to spend large sums of money to expand bread production, to create the new food distribution system, to import wheat and yeast and to subsidize the selling price of bread. For example, it is estimated that the government spends over 45 million birr every year on it's bread subsidy, in order to maintain the low consumer price of birr 0.10 per piece (125 grams weight) of bread (National Planning Office, 1985).

The major features of the new bread distribution system, introduced by the Ministry of Domestic Trade are the following:-

1. A quota system is used to control the supply of wheat-maize flour to private bakeries. Full use of the flour quota allocated to each bakery is expected and is checked by the respective Kebeles.
2. Bread produced in the city is distributed to each Kebele, according to quotas prepared by the Ministry of Domestic Trade. Then the bread is sold to consumers in ration quantities, as indicated in ration cards, at the low subsidized price of birr

0.10 per 125 gram piece. This bread has been sold through Kebele Cooperative Shops since the end of 1985.

3. All of the production of the private bakeries is expected to reach the public through Kebele Cooperative Shops, which are the controlled outlets for subsidized food.
4. Bread ration cards are used to control the quantities sold to customers in the Kebele shops.
5. Government offices, Cafeterias obtain their bakery products from government owned bakeries. These government bakeries are responsible for supplying bread to big Agencies, Institutions, Corporations, Hospitals, Schools, etc.
6. The International community in the city is expected to purchase its bread from the Victory Shop, which gets it's supply from the government bakeries (Ethiopian Food Corporation).

Under the new bread policy the Kebele cooperatives collect their bread supplies from pre-assigned private and public bakeries, using their own means of transport. The collection time is fixed (in most cases at 5 in the morning). These bakeries sell bread to the Kebele shops at the rate of 0.09 birr per piece. Thus, 0.01 birr per piece

is supposed to be used to cover transportation and other marketing expenses.

1.5 RATIONALE BEHIND THE STUDY

There are problems associated with the new bread marketing policy. The amount of government funds used for the flour subsidy is still very high. The policy did not take into account the financial constraints faced by private bread makers, when it decided on a consumer price of birr 0.10/ piece. The cost of raw materials for bread making have grown from time to time, while the consumer price has remained constant. The present bread consumer price i.e. birr 0.10/125 grams piece was set in 1976. The cost of raw materials, on the other hand, has increased since 1976, eg. flour by 7.8 percent, salt 25 percent, oil 42 percent, sugar 39 percent, yeast 100 percent and fire wood by 200 percent (Central Planning Office, 1985/86).

The new policy seems to have given more attention to the distribution than to the production of bread. Consequently, there has been a deterioration in bread quality. Poor baking methods and the improper handling of bread both in bakeries and in the Kebele bread shops, have produced bread which is often mouldy and which has a short shelf-life.

There are major food problems in Addis Ababa of which bread marketing is one. The bread marketing problem,

however, seems to be largely technical and managerial in origin and it demands urgent solution. There is in particular an urgent need for more reliable data on which to base future policy. It therefore seems advisable to undertake a comprehensive study of the current bread marketing system in the city. Such a study could help to lay the basis for the formulation and improvement of the city's bread production and distribution policy.

1.6 SCOPE AND COVERAGE OF THE STUDY

The research covers bread marketing in Addis Ababa between late 1985 to early 1989. Most of the data, however, relates to the period 1986 to early 1988, when the new bread distribution system was fully operative. Since late 1988, the new policy has been inactive due to a number of problems which will be discussed in Chapter V.

The study does not cover all of the 425 bakeries in Addis Ababa. The 224 tea-house bakeries in the city are outside the scope of the study. More emphasis is given to the 45 private modern bakeries and the three Addis Ababa Kenema bakeries, which are under the control of the municipality. These are the bakeries assigned by the Ministry of Domestic Trade to supply bread to Kebele shops according to their respective quotas. Forty four Kebele and seven church bakeries are also fully assigned by the Ministry of Domestic Trade to distribute bread to their

respective Kebele populations. The study has tried to delineate the boundary lines of the private, Kenema and Kebele bread market zones in the city of Addis Ababa. The study, thus, gives equal attention to the 45 private, 3 Kenema 44 Kebele and 7 church bakeries of the city. The study also deals with the spatial distribution of the Kebele shops and the major characteristics and attitudes of bread consumers in the city.

C H A P T E R II

STUDY OBJECTIVES AND METHODOLOGY

This chapter outlines the study objectives, data sources, data acquisition methods, the problems faced in the course of data collection and the analytical techniques used to achieve the objectives.

2.1 OBJECTIVES OF THE STUDY

The subject matter of the paper focuses on the formation, spatial pattern and effect of bread market zones in Addis Ababa. The major objectives are as follows:-

Firstly to outline the new bread supply strategy that the government has implemented in Addis Ababa since late 1985.

Secondly to map and analyze the spatial structure of the new bread distribution system. The outcome of this objective has resulted in the construction of a new map of Addis Ababa that depicts:-

a) The exact location of all the government, private and public bakeries in the city.

b) The location of all of the publicly controlled bread selling outlets in the city, i.e. the Kebele Service Cooperatives.

c) The transportation network that links the bakeries with the Service Cooperatives.

d) The bread market zones of the three types of bakery.

The third major objective involves the analysis of the accessibility of the city's population to the bread supply system. This involves the description and analysis of:-

a) The distribution of bakeries relative to the population served by them.

b) The number of Kebele bread shops relative to the population size served by them.

c) The bread quantities supplied to each Kebele in relation to the population of the Kebeles.

d) The deliveries of bread quantities in relation to the numbers of low-income people living in each Kebele.

The fourth major objective is to try to identify the factors that have impaired the success of the policy of distributing bread through Service Cooperatives.

The fifth major objective is to identify the attitudes of the consumers to the present marketing system and to determine the place of bread in their food consumption behaviour.

The final major objective of the thesis is to describe and analyze the methods of transport used to deliver bread from the bakeries to the Kebele shops.

2.2 HYPOTHESES AND METHODS OF ANALYSIS

The first hypothesis advanced by the researcher is that the spacing of bakeries in Addis Ababa approaches complete nucleation. The objective here is to analyze the spatial distribution of public, (i.e. Kebele, Church, the three Kenema), private and government bakeries in the city as a whole. According to RHT Smith, (1971), all patterns of distribution in terrestrial space, be they clustered, random or regular, can be regarded as the results of a process (Smith, RHT in Meillassoux, C.ed. 1971, 320). As to the processes that determine any patterns of distribution, Smith (1971) argues along the following lines:-

> The processes giving rise to locational patterns are of two types: a contagious process which results in the clustering together of units in agglomerations and one of mutual repulsion or competition which, given the appropriate topographic and population distribution characteristics in an area, will result in a uniform or maximally spaced, pattern of market locations (Smith, RHT, 1971, 337).

The same idea is also supported by Hudson (1969, 369-73). Thus, analysis of the distribution pattern of the city's bakeries can be useful in identifying the processes which gave rise to the locational pattern of the bakeries. A means of analyzing spatial patterns is provided by the nearest neighbour statistic. This measure enables one to describe "two dimensional point patterns" as clustered

(reflecting a process of "contagion"), uniform (indicating the operation of a process of mutual repulsion or competition) or random (in which case contagion and competition will have played no part) in the allocation/distribution of the points, i.e. bakeries, in space (Smith, 1971, 336).

Location is an important component of any commercial system, especially in one such as a food supply system. For example, "where the pattern of distribution of the retail outlets is dispersed, it can be said, that the great majority of the people in the low-income areas have relatively easy access to the supply points" (eg. Sporrek A., 1985, 130). The researcher has, therefore, tried to describe statistically the spatial distribution of bakeries in Addis Ababa, using the nearest neighbour index. This technique has been widely used by geographers over the last thirty years to analyze settlement patterns (eg. Hudson J.C. 1969, 365-73; Curry L. 1964,130-46; Garner B.J 1978, 303-55; King L.J. 1962, 1-7; Brush J.E. 1953, 380-402; Dacey M., 1963, 55-75; the distribution pattern of urban shops (eg. Getis A. 1963, 14-22; Rushton, G. 1970,486-496), the spacing of rural market places (eg. Smith R.H.T., 1971, 319-46) and the location of public service facilities (eg. White A.N. 1979, 18-25. The technique is widely referred to in the geographical literature and numerous accounts exist,

relating to its computation and interpretation (eg. Dacey M.F., 1960,81-87 ; Bassett K., and Davis R., 1975, 181-91 ; Thompson H.R., 1956, 391-94, Clark P.J., 1956,373-74, Dacey M., 1962, 55-75 ; Clark and Evans, 1954, 445-53 ; Haggett, Cliff, Frey, 1977, 100-101 ; Hammond and McCullagh, 1985, 207-77 ; Chorley and Haggett, 1978, 301). The application of this technique is considered appropriate for this study because the number of bakeries and Kebele shops is large (i.e. the writer's research includes the total population of Kebele shops and bakeries in the city). In such a situation the use of the nearest neighbour test is justified (Smith RHT. 1971, 338).

Nearest neighbour analysis enables spatial point patterns to be measured by an index (Rn) which ranges between zero for a perfectly clustered pattern and a maximum of 2.15 for a perfectly uniform pattern (Garner, 1978, 310). A value of 1 is associated with a random spatial pattern. In the case of bakeries in Addis Ababa, the researcher expects a relatively clustered spatial pattern. It is therefore expected that the nearest neighbour index will have Rn. values between 0 and 0.43.

The second hypothesis advanced by the researcher is that the spatial pattern of bread outlets (Kebele shops) approaches complete uniformity. The objective here is to examine the spatial pattern of bread shops in the city of

Addis Ababa. The testing methodology for this hypothesis is the same as that for hypothesis one. According to Christaller's model, the location pattern of an urban retail distribution system tends towards perfect uniformity or regularity (Christaller cited by Garner B.J., 1978, 307). This is the basic idea of the "regular latice" model advanced by Christaller. The researcher's expectation therefore, is that in the case of the Kebele Bread Shops the distribution pattern will be uniform. The value of the nearest neighbour statistic (Rn) is expected to be between 1.72 to 2.15.

The third hypothesis promoted by the writer is that bread transportation costs tend to be proportional to the distances between the bakeries and the Kebele shops assuming that the same means of transportation are used for the deliveries. The objective here is to estimate the share of the bread transportation costs in bread marketing costs and to examine the means of transportation used for bread deliveries. Transportation costs are paid by the bread retailers, i.e. Kebele shop operators. Most of the 284 Kebeles do not have their own means of transport, therefore most have to hire transport to bring bread to the Kebele shops.

However, one should bear in mind that each mode of transport has it's own cost structure. An understanding of

the basic differences in cost (as between transport modes) is important, for it can help the policy maker make appropriate decisions regarding the assignment of bakeries to the respective Kebele shops. Simple description statistics (e.g. mean, percentages) will be used to outline the main features of the bread transport system.

The fourth hypothesis forwarded by the researcher is that the choice of means of transport by the Kebeles is largely a function of the distances between bakeries and Kebele shops. This hypothesis is aimed at identifying the choice of means of transport in relation to the distances between bakeries and the bread shops. The same techniques that were used for hypothesis three were used to test the fourth hypothesis.

The fifth hypothesis advanced by the researcher is that the bakeries are favourably located relative to the consumers. Here the aim is to examine the spatial structure of bread market zones (i.e. the relationship between the bakeries, Kebele shops and the transport network that joins the two). The application of the mean-field concept has been used to test this hypothesis. This technique is recommended by the Soviet economic geographer A.A. Tatarinov, for studies of the spatial structure of state controlled commercial systems (Tatarinov, 1975, 141). Tatarinov used the technique to study the spatial structure of Soviet Fuel

Oil market zones, but the methodology can be applied to other commodities. The technique involves the calculation of the values of μ and d'. The size of these values will indicate the optimality of the location of the bakeries and their associated bread market zones.

Analysis of the spatial structure of a distribution system usually distinguishes two main elements: the producing centre (in this case the bakeries) and its tributary areas (in this case the Kebele shops and the transport network that joins the two) (Tatarinov, 1975, 401). These two elements were analyzed using the mean-field concept. The first step was to construct a map of Addis Ababa, at a scale of 1:15,000. After extensive field work the location of all of the bakeries; Kebele shops and the transport network that joins the two were plotted on the city map. The next step was to calculate the values of d' and μ The value of d' is found by the formula:

$$d' = \frac{\sum_{i=1}^{K} d_i \quad x_i}{v}$$ Where

d_i is the length of haul from the bakery to the Kebele shop in each bread supply zone;

x_i is the amount (in kg) of the haul of bread to each Kebele shop from the bakery which supplies it.

$v = \sum_{i=1}^{K} x_i$ Where i = 1,2,3.....K (i.e. Kebele shops).

The value d^1 measures the weighted length of bread-haul for each bread market zone. An alternative way of interpreting d^1 is to view it as the radius of an idealized market area. In this case d^1 describes the size of the market zone.

The index describing the distribution of bread within each bread market zone is μ. It is a magnitude relating the total amount of bread (v) to aggregate bread costs within the zone. The value of μ is calculated using the formula;

$$\mu = \frac{v}{d'} = \frac{v^2}{\sum_{i=1}^{K} d_i \quad x_i}$$

In zones with identical volumes of haul, the transport work in kg. - km. would evidently increase with a decline in the density of distribution of consumers and a decline in the density of the transport net and thus with an increase of the length of haul (Tatarinov A., 1975, 403). This suggests that the index μ describes the aggregate conditions of consumption within the zone. The higher the value of μ the more optimally the bakery is located relative to the consumers. The greater the value of d' the smaller the value of μ becomes.

As noted above, the calculations of d' and $\mathcal{M}$ are based on data derived from a map of Addis Ababa that depicts the locations of bakeries and the transport net that links the bakeries with the city's 284 Kebele shops.

The sixth hypothesis is that the bread deliveries tend to be proportional to the Kebele population size. The objective here is to determine the relationship between Kebele population size and the bread quota designated to each of the 284 Kebeles. These variables were analyzed with the help of statistical techniques at Kebele, Kefetegna and Ketana levels to examine the degree of association. This helped to identify the variations between the three levels of the city divisions. The calculations of the Gini concentration ratio, the coefficient of geographical association (cg) were done to show the degree of association between the variables. (The techniques are outlined in Hammond R. and McCullagh, 1985, 25-9; Shall Jain, 1974, 5-6; David Smith, 1975, 235-6; and Chandra R.C. 1980, 126-9). Simple regression analysis and the calculation of the Spearman Correlation Coefficient (Rs.) were done to identify the Kebeles where the association is weaker and/or stronger. [For a discussion of these techniques see M.Yeats (1974, 68-80), Hammond R. (1985,248-50), Blalock Hubert M (1979, 381-96), Hundel (1978,200-1), G.A.F. Seber (1977,42-65), David M.Smith (1981) and D.Palumbo (1969,166-193)].

The seventh hypothesis formulated, is that the size of bread deliveries is proportional to the total size of population in the low-income bracket of the Kebeles. To test this hypothesis the writer also employed the simple quantitative techniques used in hypothesis six (above). The expectation is that the bread distribution policy considers the needs of the low income people at Kebele level.

Finally the results of the attitude survey of the consumers have been analyzed using the Chi-square test to determine whether there are significant differences between consumers in different income groups and between consumers who buy bread produced by different (ownership) types of bakery. The Chi-square test has also been employed to test the statistical significance of some of the responses provided by Kebele officials and bakery operators.

2.3 DATA ACQUISITION METHODS AND DATA SOURCES

This thesis has employed data derived from primary, secondary and tertiary sources. Official publications, articles in professional journals, theses, interviews with consumers and knowledgeable people in the bread industry and Kebele shops were all utilized. Reports and minutes of governmental departments and agencies were also considered.

At the beginning of the field work the researcher decided to get an official letter from the second highest official in the Addis Ababa Municipality, copies of which

were distributed 25 Kefetegnas and apparently to 284 Kebeles throughout the city. With this letter, of introduction the investigator was able to explain the objectives of the questionnaires and the field work. The letter explained that the information collected would be used not only for research purposes, but was also designed to help the Ministry of Domestic Trade, the City Council and other government organizations involved in the administration of the city's bread marketing policy. The intention thus was to get the fullest cooperation of the Kefetegna and Kebele officials.

Having had no prior knowledge of the location pattern of the bakeries or of the 284 Kebele Service Cooperatives bread shops in the city, it was necessary to do extensive field work in order to obtain the data, needed to map the main features of the city's bread marketing system. The initial map-work phase of the field work also allowed the researcher to orient himself to the scope and complexity of the research problem. Forty four sample Kebeles (their selection is discussed below), 201 bakeries, 284 Kebele shops, 284 Kebele offices, 25 Kefetegnas, 10 super markets, 5 government bread retailing shops and the bread delivery routes had to be exactly located on the map, during this initial phase of the research. The investigator toured the city of Addis Ababa, carrying with him a city road map on

which the above mentioned man-made features were located with all possible accuracy. The accurate location of, the bakeries, Kebele shops and delivery routes, was very essential, for precise locations and distance measures were needed to calculate the nearest neighbour index and the indices associated with the mean field technique. The point pattern data (i.e. the location of the bakeries and Kebele shops) Kebele and Kefetegna boundaries and the bread delivery routes were marked on a map (1:15,000 scale to minimize map distortions). The final map was then drafted and printed at the same scale. The essential details of the bread market system would have been lost, however, if the map was reduced to page - size. Its original size has been retained and is found in the pocket on the end-cover of the thesis (Fig 1, on the end cover of the thesis).

For the depiction of variables such as population bread market zones and spatial variations in bread quotas, however, the map of Addis Ababa was reduced to page size, i.e. 1:85,000, from a map of scale 1:20,000 scale. (A pantograph was used to enlarge the 1:20,000 map to 1:15,000 and to reduce it to 1:85,000.

The total intra-urban travel covered about 1,500 km, of which about 95 percent was done by car. This work was done between late January and early May 1988, because rechecking was required after the preliminary map work.

The first phase of the researcher's field work also involved the distribution of questionnaire II to 201 bakeries, questionnaire III to 284 Kebele shops and questionnaire IV to 15 concerned ministries and organizations (the details for each questionnaire will be discussed later)(Refer to Appendix I, parts 1,2,3 and 4 for questionnaires).

The second phase of fieldwork involved the distribution of questionnaire I to consumers in 44 selected Kebeles. This task was carried out with the help of 22 field assistants, selected from the graduating class of the Geography and Economics Departments, Addis Ababa University. Care was taken to try to ensure the selection of diligent interviewers. The chairman of the Geography Department called all the graduating students from his department, together with five students from the Economics Department to an auditorium. A list of possible candidates with their names, grade-point averages and instructors' recommendations was used by the investigator. It was announced that the selection of interviewers would be, made based on the following characteristics. Those selected had to have good listening ability, be able to record accurately the replies given, and be likely to encourage the respondent to reply to the best of his ability. The selected students also had to be disciplined and of good personal presentation. Their

grade-point averages and past experience were also considered. Of the twenty two selected three were females. Three days training was conducted so that the interviewers had adequate orientation to the research project. All the questions (80 in number) in the questionnaire were read to the interviewers and were thoroughly discussed. Then discussions were conducted on how the interviewees were to be selected; how the interview was to be obtained; how it was to be opened and closed. The students were also briefed on the importance of avoiding antagonising the respondents, and of introducing bias in to the interview situation. They were also advised on how to approach the selected Kebele officials so to get their maximum support. The twenty two interviewers were then assigned in pairs for the purposes of convenience and security. Guide maps of Addis Ababa, showing the location of the selected Kebeles, were then distributed to each interviewer. The assignment of Kebeles was based on the choices of the interviewers, but the arrangement in pairs was determined by the researcher.

The second phase of field work involved the collection of questionnaire data relating to the purchasing behaviour and attitudes of consumers in the city (questionnaire I). It also involved questionnaire surveys of bakery owners (questionnaire II) and the attitudes of Kebele workers (questionnaire III) to the bread marketing system, as well

as data about Kebele shops and bakery operations. Questionnaire I, the consumers attitude-survey was conducted in 44 "problem" Kebeles. These were Kebeles, where bread deliveries were "significantly" (i.e. +/-, 1 SD) above or below the per capita average for the city as a whole (See appendix II, Table I and Fig 2).

Two lists of Kebeles with their respective per capita consumption, bread quotas and population for the years 1985/86 and 1987/88 were prepared. These were years when new bread quotas were set by the Ministry of Domestic Trade. The mean per capita bread consumption and the standard deviations from the mean at the Kefetegna and Kebele levels for the two years were calculated. Those Kebeles , where the per capita bread consumption was equivalent to the Addis Ababa average ($\bar{X}$) plus the standard deviation (SD), or above, and those Kebeles when bread consumption was equivalent to the mean consumption ($\bar{X}$) minus the standard deviations (SD), or below, were selected as sample Kebeles. (See Appendix II Table 1). The Kebeles at the upper and lower extremes of the whole set of 284 Kebeles were presumed to be the problem Kebeles. It was assumed by the researcher that the magnitude of the problems related to the new bread distribution system would be stronger within these two extreme groups. Thus it was decided to conduct the interviews in these Kebeles.

The location of the "problem" Kebeles was mapped using the bread delivery data for the years 1985/86 and 1987/88 (Fig. 2). In 1985/86, there were 34 Kebeles, where per capita consumption was equal to the mean city consumption plus one standard deviation (SD) or above. There were also 19 Kebeles in 1985/86, where per capita bread consumption was below the city mean minus one standard deviation (or more). For the year 1987/88, the number of Kebeles in the upper and lower ends of the list were 8 each. Thus the number of the "problem" Kebeles for the years 1985/86 and 1987/88 totalled 69.

The writer is aware of the fact that the best sample size is that which minimises the standard error of the estimate, assuming that accuracy is the prime criterion in marketing research. The cost of information, however, is a major determinant of the quality and quantity of research that can be conducted. The cost of information, moreover, is measured not only in terms of money but interms of the time and effort invested in its collection. The researcher was aware that accuracy can usually be increased by enlarging the sample size, but he was also aware that there is a point when the marginal increase in accuracy obtained in this way is not worth the additional expense of acquiring that accuracy. It was with this in mind that the researcher

decided to reduce the sample size to 44 "problem" Kebeles from the original 69.

The decision to conduct interviews in 44 Kebeles was directly influenced by two related considerations: the number of households to be interviewed in each Kebele and the total number of households to be interviewed. To minimize time and cost the total number of interviews was set at between 400 and 450. The number of households to be interviewed in each Kebele was set at 10, hence the sample of "problem" Kebeles would consist of 40 to 45 Kebeles. The researcher decided to conduct the interview in 44 Kebeles.

There were elements of subjectivity in fixing the number of Kebeles and households to be covered in the survey, because of time and expense considerations. It was, thus, necessary to reduce the number of "problem" Kebeles to 44 from 69 using the following simple ratio. Examination of the 1985/86 data base indicated that there were 56 "problem" Kebeles, 37 in the upper extreme, and 19 in the lower extreme. However, three of the "problem" Kebeles in the 1985/86 list were not considered, because they also appeared in the 1987/88 data base and were selected as "problem" Kebeles for that year (see below). Thus only 53 Kebeles (34 in the relatively high consumption and 19 in the relatively low consumption groups) were considered from the 1985/86 list. The total number of "problem" Kebeles in the high

consumption group was almost double that of the low consumption group (34/53 : 19/53). It was, therefore, decided to consider two thirds of the 34 (relatively high consumption) and one third (relatively low consumption) of the 19 "problem" Kebeles for the year 1985/86. A total of 28 Kebeles (22 upper extreme Kebeles and 6 lower extreme Kebeles) were thus selected from the 1985/86 data base. The names of all the 34 (relatively high consumption) "problem" Kebeles were written on pieces of paper and put in a cap. The paper was mixed the 22 sample high consumption Kebeles were drawn turn by turn. The same procedure was repeated to identify 6 out of the 19 (relatively low consumption) Kebeles.

Analysis of the 1987/88 bread consumption data base indicated that 16 Kebeles were "significantly" above or below the per capita consumption for the city as a whole. Eight of the "problem" Kebeles were in the relatively high consumption 8 were in the relatively low consumption catagories. Thus, it initially seemed necessary to include all the 16 "problem" Kebeles in the sample. Moreover comparison of the list of "problem" Kebeles for 1985/86 and 1987/88 indicated that three "problem" Kebeles appeared on the list for 1985/86. These three kebeles were included in the sample Kebeles drawn from the 1987/88 data base (See Table 1).

Having identified 44 "problem" Kebeles (the sampling frame) in which to conduct the interviews, the researcher then selected ten sample households in each of the 44 sample Kebeles . The number of households to be interviewed in each Kebele was restricted to ten, mainly to minimize the cost involved in the field work. The ten households in each Kebele, were selected using the equal interval sampling method. Every tenth household number on the Kebele list, starting with one household between 1 and i (using random numbers) was selected. The total number of the sample households was thus 440. All of the 440 sample households were successfully covered in the interview work.

2.3.1 Questionnaires' Administration

Four types of questionnaire were administered in the city in 1987/88. These are questionnaire I questionnaire II, questionnaire III and questionnaire IV. The details are as follows:-

2.3.1.1 Questionnaire I (See Appendix I, part 1)

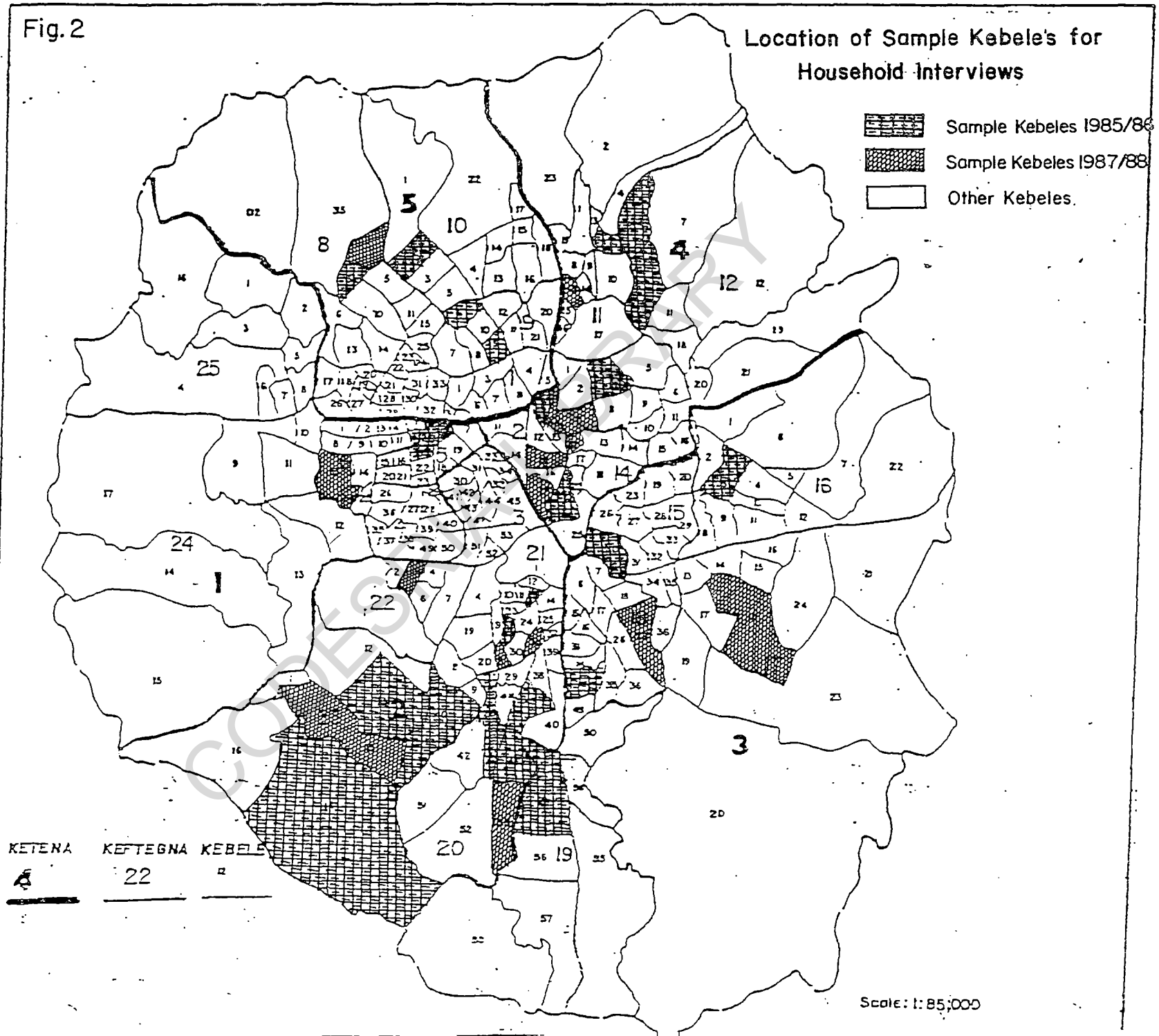
This questionnaire was administered to 440 sample households. The information collected during the interviews was intended to provide the data for objectives three, four and five (See section 2.1). Data relating to the socio-economic characteristics of bread consumers, bread consumption characteristics and the

Table 1
List of Kebeles with bread deliveries equivalent to the average ($\bar{X}$) per capita consumption for the city as a whole +/- 1SD (1985/86 and 1987/88).

1985/86 Kebeles With Pcc > $\bar{X}$ + 1SD						1987/88 Kebeles With Pcc > $\bar{X}$ + 1SD		
Keft	Keb	Pcc(kg)	Keft	Keb	Pcc(kg)	Keft	Keb	Pcc(kg)
#6	24	35	21	22	40*	6	24	33.5*
5	17	36*	23	08	43	20	53	34.13*
25	05	41	23	10	42*	2	10	32.10*
19	47	39*	23	11	37	2	15	31.67*
21	13	38*	23	12	45	2	17	32.43*
16	03	40*	23	13	41*	14	12	39.30*
			23	14	41*	11	13	35.84*
#2	15	49	23	15	34.7	8	01	43.01*
12	06	41*	Keb. With < $\bar{X}$-SD					
12	22	38*						
14	21	42*	22	06	23	Keb. With Pcc < $\bar{X}$ + 1SD		
14	24	41*	5	12	24*			
15	23	46	7	34	22	6	13	26.24*
15	30	41*	5	23	22	22	03	24.78*
8	03	40*	4	29	25*	21	31	23.52*
11	05	39*	4	36	24	21	21	17.97*
8	25	37	25	03	24	23	15	24.15*
9	06	39*	25	06	21	17	18	20.85*
9	09	35*	18	41	25*	18	27	28.24*
10	02	36*	21	25	23	14	07	22.97*
20	28	39*	2	09	24*			
20	29	41	3	34	23			
20	43	40*	13	03	25*			
20	44	42	11	17	21			
20	45	42*	8	11	22			
20	46	42*	13	05	23			
20	51	41	13	06	25			
20	52	41	13	08	21			
#20	53	45						
21	09	46	5	06	25*			
Total = Kefetegnas involved = 17 Kebeles involved = 56						Kefetegnas involved= 11 Kebeles involved = 16		
$\bar{X}$ = 29.97 SD = 4.82 N = 284						$\bar{X}$ = 29.9 SD = 1.66 N = 284		

Source: Ministry of Domestic Trade, 985/86 and 1987/88
Calculation is added.
Note: # = Overlapped Kebeles
* = Sample Kebeles for the years 1985/86 and 1987/88.

Fig. 2



quality of services rendered to consumers by Kebele workers was obtained from this questionnaire.

The preliminary questionnaire had 110 questions but 30 questions were dropped after pretesting. The questionnaire includes a combination of open ended and closed response questions. Most of the questions were constructed in an open-ended style, so that the respondents could also express their needs and problems in more detail. In some of the questions the researcher wanted the depth of the replies to be limited and thus closed responses were expected.

The pretest was conducted on 40 households in Kefetegna 23 Kebeles 8 and 12. This pretest stage provided a valuable opportunity to test the questionnaire design, phrasing and the questions sequence. On the basis of the responses some sensitive questions were dropped and some were reworded for purposes of clarity. Statements that sounded ambiguous to the interviewees were reformulated. Questionnaire I was thus prepared in its final form, with only 80 questions, and was administered by the 22 field assistants during the month of May, 1988. The interviews were conducted in a formal, structured style. The investigator was present on several occasions, during the course of the questionnaires' administration, to ensure that the interviewers, conducted the interviews in a diligent manner. The list of the 440 households was with the investigator for checking during

supervision. Collection of all the household interviews was completed within a two week period.

2.3.1.2 Questionnaire II (See Appendix I, part 2)

This questionnaire was used to elicit information from private, public and government bakery owners (201 in total) regarding their attitudes towards bread production, consumption, the new bread distribution (marketing) policy and the provision of raw materials by the relevant government bodies. The data collected through this questionnaire was used to achieve objectives three and four (See Chapter II, section 2.1.).

The number of questions in the original questionnaire was 40. This number was reduced to 27 after pretesting. The pretest was done in Kefetegna five using ten bakeries. This Kefetegna was chosen as a pretest centre mainly because most of bakeries here are not very far from each other. After the pretest many errors in the design of the questionnaire construction were identified and promptly rectified, to the satisfaction of the investigator. Most ot the 27 questions involved open-ended responses (Appendix I, Part 2).

The interviews involving questionnaire II were all conducted by the investigator himself, since it was

also necessary to locate all the 201 bakeries on the map of Addis Ababa. Questionnaire II was thus distributed to all of the bakeries in the city during the map work phase of the research. Questions were read and explained to the respondents, when the questionnaires were delivered by the investigator. The bakery owners were asked to fill them in and return them to the investigator within two weeks. The return dates were fixed (subject to the investigator's and the bakery owner's mutual agreement) for collection by the researcher himself. When the researcher visited the bakeries for a second time to collect the questionnaires he rechecked their responses and repeated questions (verbally) which had not been completed properly. Most of the interviewees completed the questionnaire at the time of the interviewer's return visit. The compilation of this questionnaire was thus largely oral and it almost took three months. The work was completed in late June 1988. This was the most difficult and time consuming task that the writer experienced during this research project. Out of the 201 bakeries visited, 193 questionnaires were successfully filled in, a 96 percent response rate. Eight bakeries were omitted because six (3%) were closed and the remaining two (1%) respondents were not

cooperative enough to fill up the questionnaires, even in the researcher's presence.

2.3.1.3 Questionnaire III (See Appendix I, part 3)

This questionnaire was intended to collect data concerning Kebele shop operations, the attitudes of the Kebele officials and the problems faced by them in the course of bread distribution to consumers.

The total number of questions in the original questionnaire was 40 and was reduced to 34 after the pretest. The pretest was conducted in five Kebeles (Kefetegna 23, Kebeles 9,8,14 and Kefetegnas 20 Kebeles 29,28). Most of the items are open-ended response questions (Appendix I, part 3). The final version of the questionnaire was distributed to 284 Kebeles, 15 super markets and to 5 government bread shops during the map work phase of the research, i.e. when the locations of all the city's Service Cooperatives were being plotted on the map of Addis Ababa. At the same time instructions and explanations were given to the relevant officials by the investigator himself. Care was taken to avoid misinterpretation of each question and misunderstandings of the instructions by those who were to fill in the questionnaires. The questionnaires were to be filled up by each Kebele person who was in charge of the Kebele shop. The researcher indicated to

the senior Kebele officials that he preferred that the questionnaire be filled up by the Kebele employee who was responsible for bread sales, provided that he could read and write. The researcher hoped that questionnaire III would be filled up by the relevant Kebele officials during the first two weeks of May 1988, so that verbal checking and clarification of the responses could be done by the researcher during subsequent visits to the Kebeles in late May 1988. Ninety eight percent of the questionnaires were completed in the presence of the investigator. One constant sources of frustration in the course of this study was not being able to get hold of the relevant Kebele officials at the appointed time. Roughly 10 percent of those interviewed failed to keep their appointment on five occasions; 55 percent failed to keep their interview appointments, three times, 25 percent two times and the rest one time. Of the 284 service cooperatives approached, 15 used delay tactics when asked to fill in the questionnaires. Despite this, all the 284 questionnaires were completed by late June 1988. The writer was concerned that a time lapse might result in response variations over time but almost all the respondents had been involved with Kebele bread distribution for more than three years and had access to the relevant information and Kebele records. One major factor that contributed to the long time taken to collect the information was the problem

related to the means of transport for the field trips. The Ministry of Domestic Trade did not cooperate by letting the investigator use the amount of fuel required for the field work, despite an official letter from the school of graduate studies, A.A.U requesting cooperation.

2.3.1.4 Questionnaire IV (See Appendix I, part 4)

The fourth questionnaire was employed during the course of semi-structured interviews. Unlike questionnaires I, II and III, it was prepared in English on the assumption that it would be filled up by senior decision makers in the relevant ministries and organizations. The purpose of this questionnaire was to get information related to the decision making structures and processes in the ministries and organizations involved in bread production and distribution. It was also designed to help the researcher determine the attitudes of the decision makers to the current problems of bread production and distribution in Addis Ababa. The questionnaire thus helped the researcher determine the factors that, in the eyes of the decision makers, impair the success of bread distribution system. It also provided insights regarding the future development of the programme and its possible extension to areas outside Addis Ababa.

Questionnaire IV has 37 questions which are the combination of open-ended and closed responses questions (Appendix I part 4). It was distributed to the fifteen government organizations most concerned with bread production and distribution. (See Appendix I adjacent to part 4). Twenty five percent (four questionnaires) of the fifteen questionnaires were completed successfully, while 33 percent (5 organizations) refused to cooperate and did not fill in the questionnaire. Six organizations/Ministries (42%) preferred to provide oral (unofficial) responses, rather than completing the questionnaire. As a result the researcher's conclusions concerning the decision makers' views are based on the results of the 4 collected questionnaires, the 6 oral interviews, together with the investigators own observations in the other (less co-operative) organizations.

It is to be stressed that the responses to Questionnaire IV do not represent the policy makers' Official views, because the new bread distribution policy was under review at the time of this research. Their responses should be taken as the professional views of technocratic civil servants'not as official government policy.

2.3.2 Secondary Data Sources:

The four questionnaires and the supplementary interviews were designed to gain data which were not readily available from the relevant organizations. The relevant statistics, however, concerning the number of bakeries, bread production, bread quotas, Kebele population and low-income population were obtained from published and unpublished documents of the concerned ministries and organizations. For example, data concerning the number of bakeries, their addresses, bread quotas, bread production and attainable capacities was collected from the Ministry of Domestic Trade in Addis Ababa. This information was used in relation to objectives two and three. Kebele population data, for the years 1982/83 to 1987/88, however, was obtained from the Central Statistical Office. Low-income population estimates for the year 1980/81 were obtained from the office of the Addis Ababa City Council. Both types of population data were vital for objective three. The Ethiopian Food Corporation was an important source of information concerning flour supplies, flour quotas and the development of government bakeries in the city since 1982/83.

In addition to the secondary information obtained from these ministries and corporations, data concerning

bread delivery routes and the distances between bakeries and Kebele shops, and the areas of Kebeles, Kefetegnas and Ketanas were estimated from the map of Addis Ababa prepared by the researcher. Planimetric measurement methods were used to estimate these distances and areas.

Conversion of units and calculations are added to all tables and appendixes within the thesis. Thus, only the sources of the raw data are indicated under the tables and appendices.

C H A P T E R III

THE BREAD PRODUCTION SYSTEM

The basic components of any market system are the production system, the consumption system and the transport system which connects the producing centers to the consumption areas. The producing (freight generating) centers, the consumption centers and the transport net that delivers the goods to the consumers thus make up the major elements of a market zone (Tatarinov, A.A., 1975, 401). The writer's aim in this chapter is to describe the bread production component of the bread marketing system in Addis Ababa. The other components, the location of bread demand in the city, the bread retailing system and the transport network, which is used to distribute bread in Addis Ababa are discussed in the next chapter.

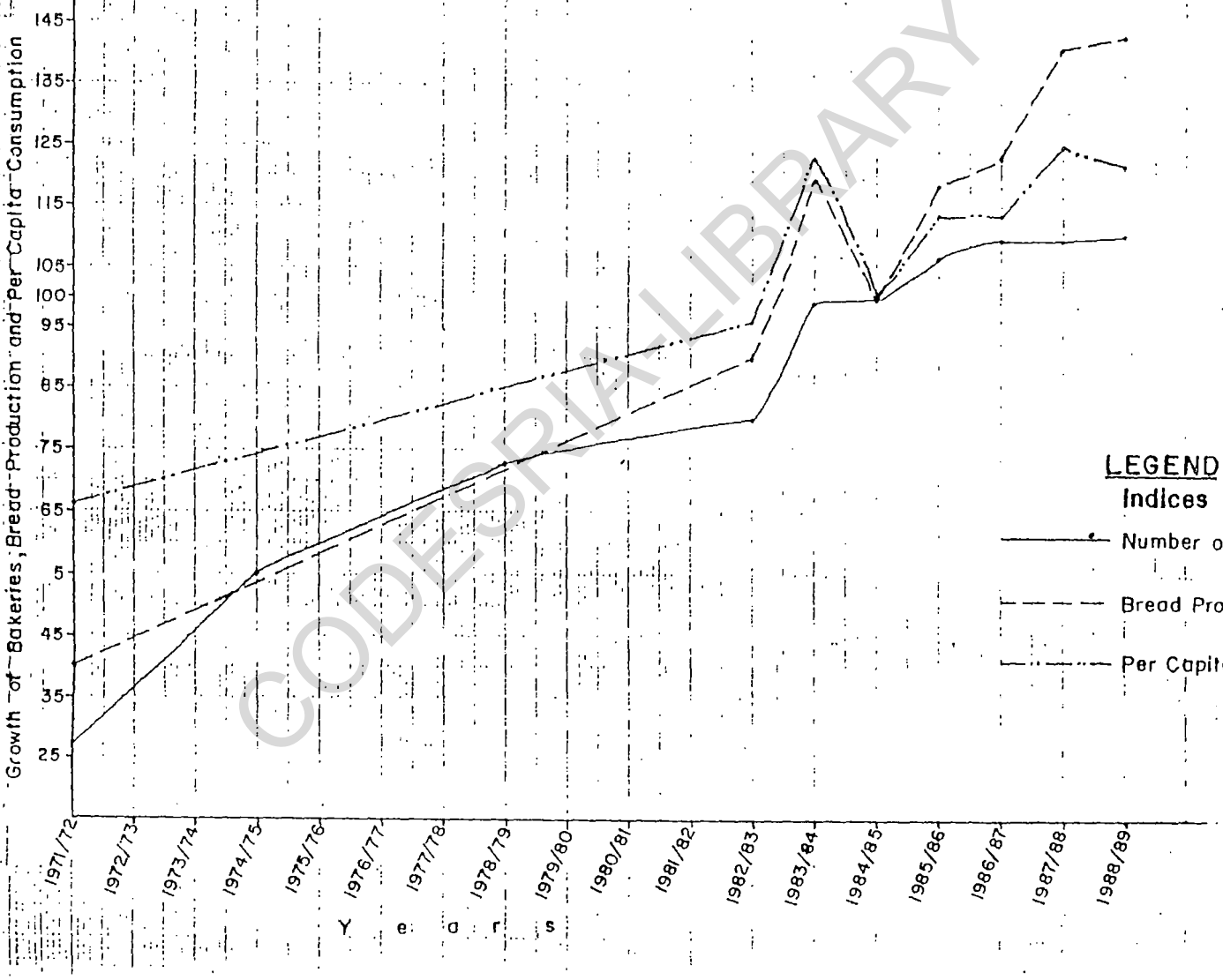
3.1 NUMBER OF BAKERIES AND BREAD PRODUCTION (1971 TO 1988)

According to a survey conducted by the Ethiopian Food Corporation in 1986/87 in collaboration with the Ministry of Domestic Trade there are 425 bakeries in Addis Ababa. The researcher's field work in 1987/88 confirmed this figure. Of the 425 bakeries, 224 are tea-house bakeries. The discussion and data below exclude these small bakeries and focus on the 201 bakeries which produced most of the city's bread in 1988. The growth in the number of bakeries and of bread

Fig. 3

Number of Bakeries, Bread Production and Per Capita Consumption 1971/72- 1988/89

(1984/85 = 100)



production between 1971 and 1988 is shown in Table 2 and Fig. 3).

The growth in number of bakeries was fast between 1971/72 to 1974/75 and then gentle in 1975/76 to 1982/83. The growth was more rapid in 1982/83 to 1983/84. Between 1983/84 to 1988/89 the number of bakeries growth has been relatively gentle (Refer to Fig. 3 and Table 2).

The growth of bread production apparently follows that of the bakeries. Bread production grew at a moderate rate between 1971/72 and 1982/83 (the difference is only 26.3 million kg. i.e. 38%). The years 1982/83 to 1983/84 showed significant growth in bread production (Fig.3). This was the period just prior to the food crisis in the whole country. The bread distribution system was not changed during this period. Bread production, however, declined sharply in 1984/85, due to cereal shortages and apparently the supply of flour to the existing bakeries was very limited. The new bread distribution system was then introduced to facilitate the supply of bread to consumers in the year 1984/85. Between 1984/85 and now the growth of bread production has fluctuated (Fig.3).

The growth in the estimated per capita consumption during the period 1971/72 to 1987/88 more or less follows the trend for the growth of bread production (Fig.3).

Table 2
Growth of Bakeries, Bread Production and Pcc/kg
1971-1988

Year	No.of bakeries		Production in kg/year		Estimated per capita* Consumption kg/year	
	Amount	Index*	Amount	Index*	Amount	Index*
1971/72	50	27	21,200,000	40	23.7	66
1974/75	101	55	nd#	--	--	--
1978/79	133	73	nd	--	--	--
1982/83	147	80	47,498,850	90	34.5	96
1983/84	182	100	63,000,000	120	44.3	123
1984/85^	183	100	52,641,000	100	35.9	100
1985/86	196	107	62,519,626.8	119	41.0	114
1986/87	201	110	65,077,499.8	124	41.0	114
1987/88	201	110	74,298,600	141	45.0	125

Sources :- 1. Ministry of Domestic Trade, 1987/88.
2. Agriculture and Industrial Development Bank S.C., A.A. 1974, P 18 and 20.

Notes:

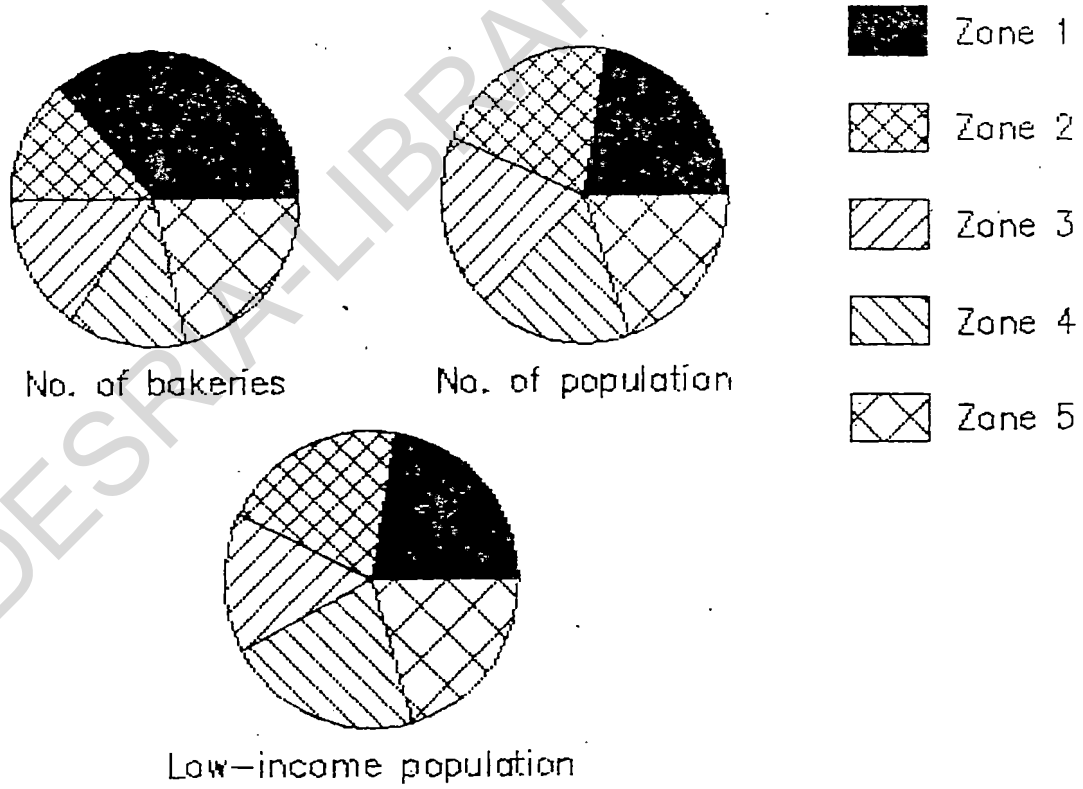
* Authors estimates, based on above sources.
^ 1984/85, the year when the new bread distribution system was implemented, is used as the base year for the calculation of the index.
# no data available

3.2 PRODUCTION TECHNOLOGY AND BREAD OUT PUT

The breakdown of the number of bakeries, according to their ownership type and production technology together with their attainable capacity and current bread production per day in 1987/88 is shown in Table 3. Fig. 4 also depicts the attainable capacity and production per day (kg) of the

Fig.4

AMOUNT OF BAKERIES,POPULATION & BREAD QUOTA
(Keftegna level – 1986)



various bakery types for the year 1987/88. Table 3 and Fig 5 indicate the relative importance of each technology type. Of the total number of bakeries in Addis Ababa, in 1987/88, 62 (or 14.6%) were modern and 363 (85.4%) were brick-oven. In terms of production capacity, however, the 62 modern bakeries represented 67 percent of the total bread production capacity, while the 363 brick-oven bakeries represented only 33 percent of the city's attainable capacity.

About 63 percent of the current bread supply is from modern bakeries and if the tea-house bakeries are excluded from consideration, the modern bakeries bread supply share reaches 79 percent of the total. The relative importance of the modern bakeries has become clear during the 1980's. The total number of bakeries in the city before 1982/83 was 366, of which only 32 (8.7%) were modern and 334 (91.3%) were brick-oven. By contrast, of the 59 bakeries established between 1982/83 and 1988/89. 30 (50.8%) were modern and 29 (49.2%) were brick-oven. Interms of attainable production capacity, the 30 modern bakeries established since, 1982/83 are even more important, representing 87.4 percent of the newly created production capacity. It is thus clear that relatively large modern bakeries have been growing most, both in terms of number and production capacity, during the 1980's. The three Kenema modern bakeries with a total

Fig: 5

Bakery types with attainable capacity and production per day (kg)

1986

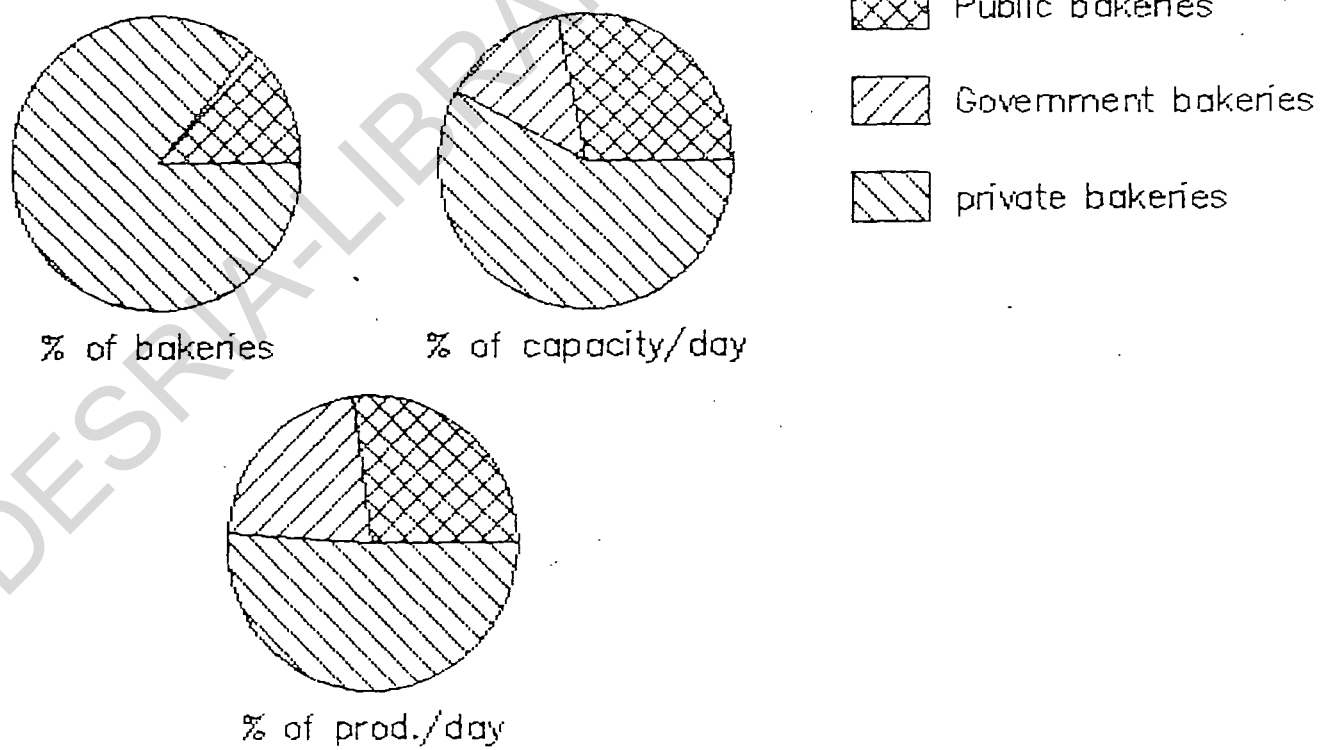


Table 3
Bakery Types With Attainable Capacity And
Current Production Of Bread Per Day (In Kg), 1987/88

Bakery Types	No.of Bakeries	Estimated Attainable Capacity (Kg/day)		Current Production (Kg/day)		Estimated Capacity Utilization Ratio (Percent)
		No	%	No	%	
I. Private Bakeries						
1. Modern	45	129,758	36	75,610	35	58.3
2. Brick-ovens	97	61,054	17	24,500	11	40.1
3. Tea-House (Brick-Ovens)	224	18,908	5	10,563	5	55.9
Sub Total	366	209,720	58	110,673	51	53.8
II. Government Bakeries						
1. Modern	3	27,500	8	27,500	13	100.00
2. Modern bakery owned by M/D/T.	1	8,750	3	8,750	4	100.00
3. Modern bakery owned by Prison House Administration	1	10,000	3	10,000	5	100.00
Sub Total	5	46,250	14	46,250	22	100.00
III. Public Bakeries						
1. Addis Ababa Kenema (Modern)	3	37,500	11	30,000	14	80.00
2. Church owned (Modern)	7	16,625	4	7,400	3	44.50
3. Kebele owned						
3.1 Modern	2	6215.50	1.8	3,125	1	50.30
3.2 brick-oven	42	38784.50	10.9	19,500	9	50.30
Sub Total	54	99,125	28	60,025	27	60.60
Grand Total	425	355,095	100	216,948	100	61.1

Source : Ethiopian Food Corporation, 1987/88
Note: 1. M/D/T: Ministry of Domestic Trade
2. Calculation and conversion of units are added by the researcher for the table in all columns.

capacity of 37,500 kg/day were established in 1984/85. Fifty seven percent of the 30 modern bakeries' capacity since 1982/83 was thus gained in the year 1984/85.

The estimated capacity utilization ratio (%) column of Table 3 shows that modern bakeries perform better than the brick-oven ones for all categories of ownership. However when attention is focused on bakery ownership it is obvious that the government owned bakeries have done better. The government bakeries capacity utilization ratio was very high in 1987, compared to that of the private bakeries (53.8%) and the church (44.5%) Kebele (50.3%) bakeries. The modern city-owned (Kenema) bakeries operated at 80% of capacity.

Table 4 provides estimates of capacity utilization for the years 1982/83 - 1987/88. The city's bread industry, according to this data, has operated at between 46 and 62 percent of capacity. The performance of the government bakeries appears to have been superior, ranging from 48 to 100 percent of capacity, compared to the public bakeries (26 to 61 percent) and the private bakeries (44 to 61 percent). Several factors account for this, significant performance variations, but discussion is delayed until later (See Sections 3.4 and 3.5).

3.3 OWNERSHIP OF BREAD PRODUCTION FACILITIES

3.3.1 Private Bakeries

Table 3 indicates the presence of 366 private

Table 4
Estimated Bread Production Per Day in Kg
1982/83 to 1987/88 by Ownership Groups*

Type Of Bakeries	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
Government Owned						
a) Estimated Attainable Capacity	37500	37500	37500	46250	46250	46250
b) Current Production	26625	31625	32625	29440.63	22374.3	46250
c) Estimated Capacity Utilization Ratio (%)	71	84.33	87	63.66	48.38	100
Public Owned						
a) Estimated attainable Capacity	36208.3	46083.3	92583.3	98375	99125	99125
b) Current Production	9541.25	29125	30375	50125	60146.53	60025
c) Estimated Capacity Utilization Ratio (%)	26.35	63.20	32.81	51	60.68	60.56
Privately Owned						
(Excluding tea-house bakeries)						
a)Estimated Attainable Capacity	184437	185667	189062	189062	190812	190812
b) Current Production	95775	114250	83225	94100	98250	100110
c)Estimated Capacity Utilization Ratio (%)	51.93	61.53	44.02	49.8	51.49	52.47
Total Amount						
a) Estimated Attainable Capacity	259145.3	269270.3	319145.3	333687	336187	336187
b) Current Production	131941.25	175000	46225	173665.63	180770.83	206385
c) Estimated Capacity Utilization Ratio (%)	51.11	65	45.82	52.04	53.80	61.4

Source: Ministry of Domestic Trade and Ethiopian Food Corporation, 1987/88.

Note:-
* Calculations and conversion of Units are done by the researcher for all figures.

bakeries, (45 modern, 97 brick-ovens and 224 tea-house bakeries) in Addis Ababa. Their total attainable daily production capacity was estimated at 209,720 kg in 1987/88 but their current production was limited to 110,673 kg/day, a difference of 99,039 kg/day. The private sector's production was thus only 53 percent of attainable production capacity and could be attributed mainly to flour shortages (See sections 3.4 and 3.5 below).

As indicated in Table 4 for the years 1982/83 to 1987/88 for the total city bread capacity in the private sector, the highest was 199,812 kg/day (1986/87 and 1987/88) and the lowest was 184,437 kg/day (1982/83). In terms of current production, the highest was 114,250 kg/day (1983/84) and the lowest was 83,225 kg/day (1984/85) of the six years total (Table 4).

The private share of capacity has been declining since 1982/83 (Table 5). The highest share was 71.5 percent (1982/83) and the lowest was 56.7 percent (1985/86, 1986/87). The current bread production share has also declined. The highest was 72.6 percent (1982/83) and the minimum was 48.5 percent (1987/88). The shares of the private sector are thus declining from year to year (Table 5).

3.3.2 Public Bakeries

Since 1983/84, 54 public bakeries have been established

in the city. Their estimated attainable production capacity had grown to 99,125 kg/day, compared to a current production of 60,025 kg/day in 1987/88 (Tables 3 and 4) . The level of capacity utilization in the public bakeries has also risen rapidly, from 26 percent in 1982/83 to 61 percent in 1987/88, since they, together with government bakeries tend to have a favourable flour supply (See sections 3.5 below). As a result, the share of the public bakeries in the city's total bread production has grown by a factor of four since 1982/83, rising from 7 percent to 29 percent in 1987/88 (Tables 4 and 5).

3.3.3 Government Bakeries

There were five Government bakeries in Addis Ababa in 1988, all modern, with a total capacity of 46,250 kg per day. The prison house bakery and one operated by the Ministry of Domestic Trade are included in the government bakeries because they are government owned (See Table 3). As noted above the government bakeries have operated at high capacity levels during the 1980's (Table 3 and 4). As a result the shares of government bakeries in total city bread production has risen during the 1980's from an estimated 20 percent in 1982/83 to 22 percent in 1987/88 (Tables 4 and 5).

The role of private, public and government bakeries

during the years 1982/83 to 1987/88 has been clearly seen in Tables 4 and 5 for the city of Addis Ababa. The private sector is still largest in capacity (57% of the city total in 1987/88) but interms of production it's relative importance has declined (i.e. from 73% in 1982/83 to only 49% in 1987/88) (See Table 5). The roles of public and government bakeries have shown growth, especially interms of production. Most of the new capacities are of either public or private bakeries. The capacity utilization ratio for the public bakeries in 1982/83 was only 26 percent but in 1987/88 grown to 61 percent. The role of the three Kenema bakeries within the overall public sector is very significant. The growth in the share of the public capacity in 1984/85 rose to 29 percent from 14 percent in 1982/83 because of the three Kenema bakeries, which started operation in 1984/85. The utilization ratio of the government bakeries was 71 percent in 1982/83 but had grown to 100 percent in 1987/88.

In sum, the trend in bread production capacity and bread output in the 1980's in Addis Ababa shows that the share of public bakeries has been growing more than the others, notably the private bakeries which have declined in importance since 1982/83.

3.4 BAKERY PERFORMANCES BY OWNERSHIP

As noted above considerable variations exist in bakery performance, depending on ownership type. In 1987/88 estimated capacity utilization was highest for government

Table 5
Estimated Bread Production Capacity And Current Output By Ownership Type During The 1980's (In Percent Of Total)

Ownership Type	1982/ 83	1983/ 84	1984/ 85	1985/ 86	1986/ 87	1987/ 88
Government Owned						
a) Attainable Capacity	14.5	13.9	11.8	13.8	13.8	13.7
b) Current Out put	20.2	18.1	22.3	16.9	12.4	22.4
Public Owned						
a) Attainable Capacity	14.0	17.1	29.0	29.5	29.5	29.5
b) Current Out put	7.2	16.6	20.8	28.9	33.3	29.1
Private Owned						
a) Attainable Capacity	71.5	69	59.2	56.7	56.7	56.8
b) Current Out Put	72.6	65.3	56.9	54.2	54.3	46.5
a) Total Attainable Capacity	100	100	100	100	100	100
b) Current Production	100	100	100	100	100	100

Source: Author's estimates based on Ministry of Domestic Trade, 1987/88.

(100%)and public bakeries (61%). While private bakeries had the lowest rate (52.8%) (Table 3). The data in Table 4

moreover, indicate that the situation in 1987/88 was not exceptional. Capacity utilization has always been high in the 1980's (except for 1986/87) in the government bakeries. In the case of public bakeries; capacity utilization has also increased and by 1987/88 the three Kenema bakeries were operating at 80 percent of capacity (Tables 3 and 4). The performance of the public bakeries appears to be relatively low because of the church bakeries and the 42 brick-oven public bakeries. These brick-oven bakeries operated at only 50% of capacity, while the church owned bakeries although modern, operated at less than 45 percent of capacity in 1987/88.

3.5 FLOUR SUPPLIES, FLOUR QUOTAS AND BREAD PRODUCTION

The main cause of the variations in the bread production capacity utilization ratios of the three ownership types is the nature of the flour supply system. In Ethiopia, the flour supply system reflects the relative efficiency of the Ethiopian Food Corporation, which produces the flour and the Ministry of Domestic Trade, which determines the quota allocated to flour users throughout the nation.

3.5.1 The Flour Supply Situation

There are 17 flour milling plants under the Ethiopian Food Corporation (EFC., 1987/88). Of the 17 flour mills, six are located in Addis Ababa and

four are in Shewa region (Appendix III). The others are located in Eritrea (two mills), Tigray (two mills), Harar (two mills). and Sidamo (one mill) administrative regions. Thirty-five percent of the flour mills with 31% of the EFC's production capacity are located in Addis Ababa. But thirty six percent of the total flour allocated for bakery use is supplied to the city (See Appendix III).

Most of the 17 flour mills were established prior to the 1970's and many have outlived their economic life (Appendix III). The long years of operation have resulted in the decrease of original capacities and recurring technical failures of the plants. According to the Ethiopian Food Corporation (1983/84), reduction of original capacity (total) attributable to old age was 4 percent. Within the limit of this capacity, 1112 working days were lost, of which, 39 percent, 9.5 percent, 41 percent and 1.9 percent were attributed to technical failure electrical shortages, maintenance, cleaning and raw material shortages respectively (EFC, 1983/84).

Raw material shortage though the percentage was low in 1983/84 has tended to be a significant problem in the flour industry in recent years. According to

other data provided by the Ethiopian Food Corporation for the years 1978/79 to 1987/88 there has not been a year when the corporation has received all the raw materials needed for the full operation of its mills

Table 6
Wheat Supplies to EFC by AMC, 1978/79-1987/88
In Recent of the Required Amount

Years	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
Supply as % requirement	74	85	91	89	92	97	99	97	90	90

Source: EFC., 1987/88, Addis Ababa.

Table 7
Wheat and Maize Purchases of EFC from AMC, Input Consumption And Composite Flour Production, 1982/83 to 1987/88 (Million Kg)

Years	Purchases		Input Consumption		Composite Flour # Production (Wheat & Maize
	Wheat local & Import	Maize	Wheat	Maize	
1982/83	214.324	14.559	210.001	14.393	174.856
1983/84	227.021	17.850	210.001	20.850	174.601
1984/85	222.510	26.471	222.492	26.585	191.848
1985/86	248.328	24.883	231.249	22.552	202.608
1986/87	225.699	18.189	220.651	15.527	197.473
1987/88	253.856	13.066	261.897	13.057	212.207

Source: EFC., 1987/88, Addis Ababa

Note: * Wheat purchases include 10% locally produced and 40% import.
By products, 24% local wheat, 22% imported wheat, 20% maize.

(EFC., 1987/88). For example in 1978/79, the EFC obtained only 74 percent of its raw material requirements from the AMC, while in recent years (1986/87 and 1987/88) it obtained only 90 percent of its requirements from the AMC (EFC.,1987/88). Table 6 shows the trend of the AMC's wheat supplies to the EFC, while Table 7 shows combined wheat and maize deliveries.

The total amount of wheat and maize supplied to the EFC., by the AMC depends on the AMC's purchases from the service cooperatives, producers cooperatives, state farms, International agencies and from the Ethiopian Import-export corporation. Table 8 outlines the domestic supplies of wheat and maize to the AMC, 1982/83 - 1987/88

Table 8
AMC Purchases of Wheat and Maize,
1982/83 - 1987/88 (Million Kg)

Year	Wheat			Maize		Total
	State Farms	Others*	Total	State Farms	Others*	
1982/83	124.965	60.55	185.919	53.857	37.391	91.247
1983/84	64.745	53.232	117.977	75.559	42,820	118.380
1984/85	52.724	18.153	70.877	65.449	99.441	74.891
1985/86	80.643	53.865	134.507	77.596	29.611	107.207
1986/87	97.761	78.585	176.356	136.299	58.905	195.204
1987/88	88.404	92.199	180.603	122.174	80.309	202.483

Source: AMC, Addis Ababa, 1987/88.

Note: # The data for wheat excludes imported wheat
* Others refer to Peasants, Peasant Associations, Service Cooperatives and Farmers' producers cooperatives only.

Estimated wheat imports by the AMC in 1986/87 and 1987/88 were 157.2462 and 118.3397 million kg, equivalent to 47 and 40 percent of the wheat supply.

The production capacity of the flour mills under the EFC is thus dependent on unstable domestic wheat and maize supplies and on high volumes of wheat imports (Table 8). The production of bread in Addis Ababa is, therefore interconnected with the supply of wheat and maize, the principal raw materials of the flour milling industry. Moreover the data suggest that the major raw material problem of the flour industry is an inadequate supply of wheat. The maize supply is not considered as a problem by AMC. It can still supply enough maize to meet the requirements of the Debre Zeit maize flour mill (AMC, Addis Ababa, 1987/88).

National flour production for the 6 years 1982/83-1987/88 is shown in Table 7. Output has grown but has consistently fallen short of plan targets. According to the Ten Year Perspective Plan, for example, flour production for the period 1983/84 - 1987/88 should have been 1028 million kg (EFC, 1987/88). The actual production for these years, however, was only 969 million kg, i.e. 94 percent of plan target.

The total attainable daily capacity of the 17 flour mills under the EFC was 1.132 million kg in 1987/88, while that of the 6 mills in Addis Ababa was 0.359 million kg or

32 percent of national capacity (See Appendix III). By contrast the national daily flour production of the EFC in 1987/88 was 0.589 million kg (52 percent of capacity), of which 0.472 million kg/day was allocated to the bakery industry. Of this the share of Addis Ababa's bakeries was 0.170 million kg/day, since the MDT's flour distribution committee assigns only 36 percent to the city (the rest goes to other urban centers)*.

This figure falls far short of the requirements of Addis Ababa's bakeries, which had an attainable capacity of 0.335 million kg (1987/88). It was also insufficient to meet the current bread production requirement of the city's bakeries, i.e. 0.217 million kg/day (See Table 3). It was,

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* A committee known as "National Flour Allocation and bread production - Distribution Follow up Committee" was formed in 1982, June in Addis Ababa. Members of the committee are representatives from relevant government ministries. These are 3 representatives from the Ministry of Domestic Trade, 2 from the Ministry of Industry, 1 from the Ministry of Internal Affairs. The chairman and the secretary are from the Ministry of Domestic Trade, where the office of the committee is located. It has sub-committees in each administrative region. The regional committees get the necessary guidelines from the National Committee. The committee's main responsibilities are allocation of flour quotas at the national level and flour quota allocation at the Addis Ababa bakery level. It is also involved in plan implementation, review, evaluation or monitoring work concerning flour production. It is also involved in detail in bread production and distribution work on Addis Ababa level. Eritrea, Tigray and Harar Regions have their own flour allocation committees and work based on the guidelines they get from the National Committee.

however, sufficient to meet the flour requirement of the bakeries involved in supplying the quota to 284 kebeles i.e. 0.139 million kg/day, (See Appendix II).

Table 9
National Flour Production and the Shares of Bakery Industries, 1982/83 - 1987/88 (In kg)

Year	Actual Production	Flour allocated To National Bakery Use 80%*	Share For Addis Bakeries (i.e. 36% of the 80% Share)
1982/83	174,855,700	139,884,560	50,358,442
1983/84	174,601,000	139,680,800	50,285,088
1984/85	191,848,000	153,478,400	55,252,224
1985/86	202,607,500	162,086,000	58,350,960
1986/87	197,473,000	157,978,400	56,872,224
1987/88	212,207,000	169,765,600	61,115,61

Source: EFC, Addis Ababa, 1987/88

* Flour leftover for uses other than bakeries is about 20% and this goes for the making of pasta, macaroni, biscuit, galleta and fafa products. The quantity that goes for other uses is casual and very small in amount calculation is done by the author.

Recent data thus suggest that the 36 percent flour quota allocated to Addis Ababa can meet less than 33 percent of the requirement of the city's bakeries. In such a situation many bakeries can not obtain the flour needed to produce bread for Kebele dwellers.

3.5.2 The Flour Quota Allocation System

The flour quota for the Addis Ababa bakeries and those in other parts of the nation is allocated by the

flour quota allocation committee in the Ministry of Domestic Trade (See note PP 70 under Table 9). Table 9 indicates the amount of flour allocated to the national bakery industry (80% of the total flour production) and the share of Addis Ababa's bakeries (i.e. 36% of the 80% share) for the period 1982/83-1987/88. The stated criteria used for flour allocation is the capacity of bakeries; but the data on flour allocation suggest that the criterion is not followed. When one compares the

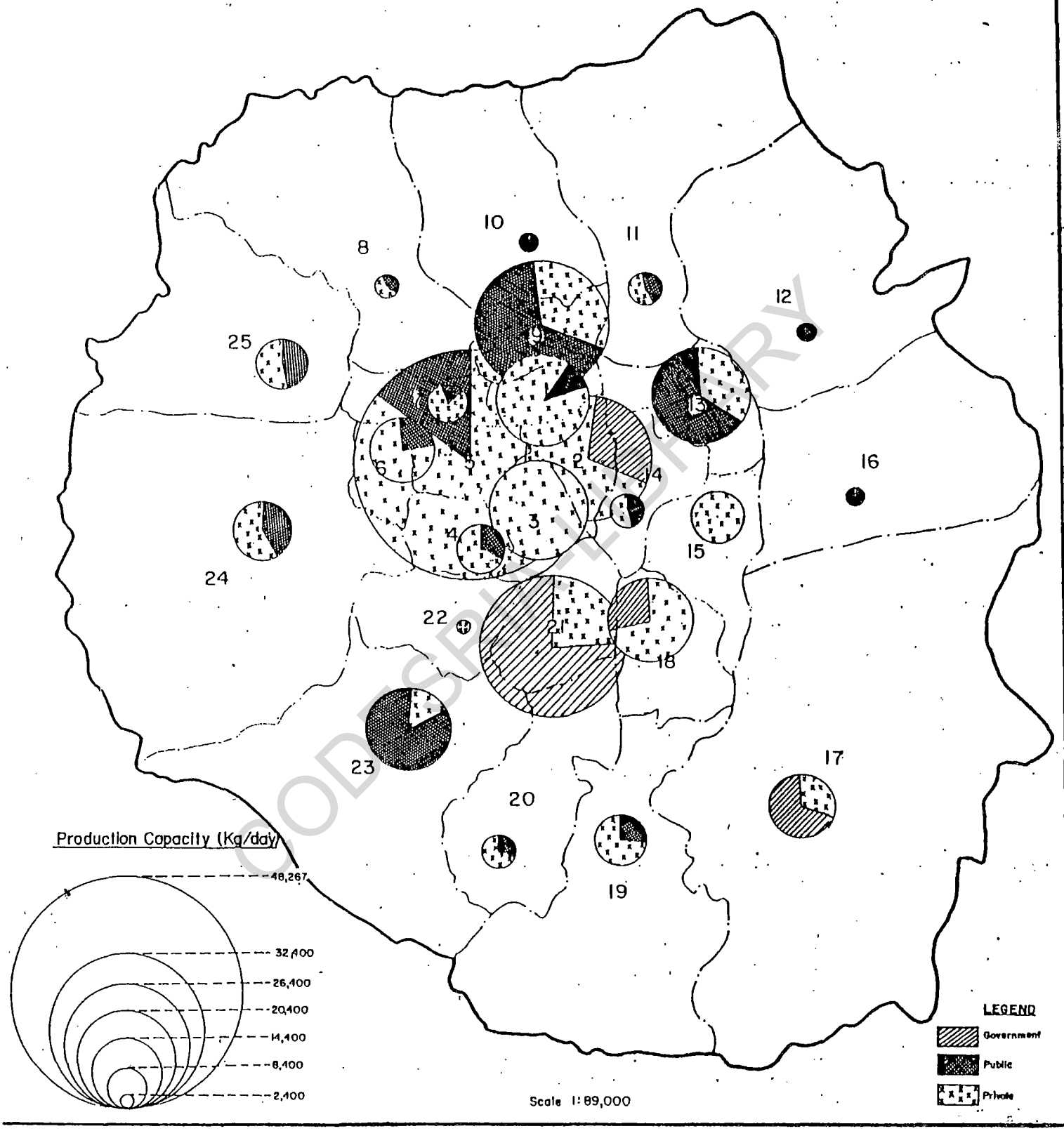
Table 10
Aggregated Bakery Capacity and
Flour Quota Ratios 1987/88.

Bakeries Type	No.	Attainable Capacity (kg/day)		Flour Quota Allocated (kg/day)	
		Amount	%	Amount	%
Government Owned	5	46,250	13.8	46,250	22.4
Public Owned	54	99,125	29.5	60,025	29.1
Private Owned (excluding tea house bakeries)	142	190,812	56.7	100,110	48.5
Total	201	336,189	100	206,385	100

Source: Ethiopian Food Corporation, 1987/88.

flour quotas allocated to the three bakery ownership types, it is apparent that priorities are given to

Fig.6 Kefetegna Bread Production Capacity by Bakery Ownership Type 1987/88



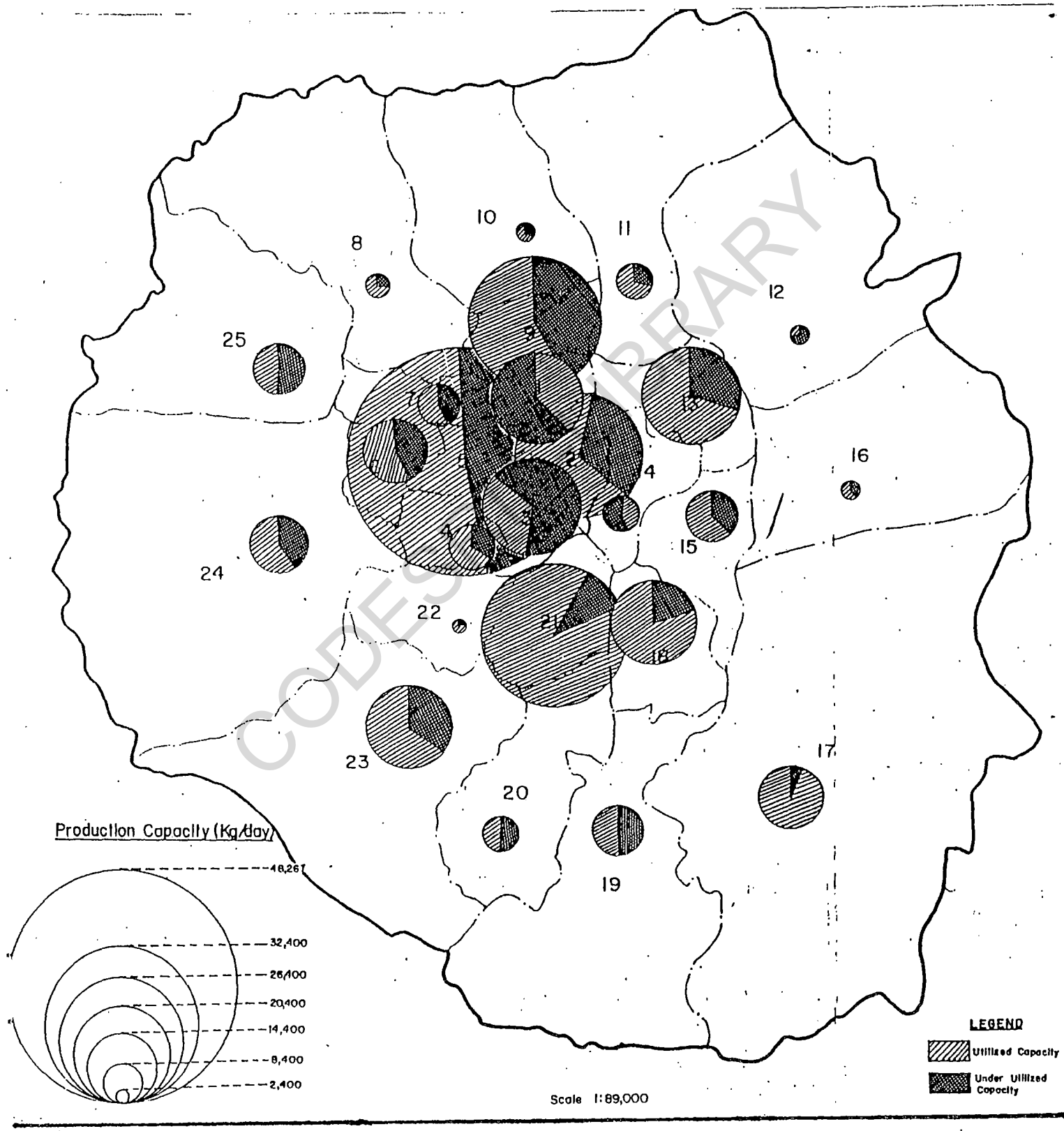
government and public bakeries (Tables 3 and 10). The government bakeries operate at full capacity and the three Kenema bakeries operate at 80 percent of their capacities (Table 3). Government bakeries , however, represent only 13.8 percent of the capacity of the cities 201 bakeries , but 22.4 percent of the flour was allocated to them in 1987/88 (See Table 10).By contrast private bakeries with 57 percent of the total bakery capacity in Addis were provided with only 48.5 percent of the total flour quota (Table 10).

3.6 LOCATION PATTERN OF BAKERIES

Figs. 6,7 and Appendix IV depict the location of bread production and capacity utilization at the Kefetegna level in 1987/88. From these it is apparent that the bakeries with higher production capacities and current production are located in the more densely populated central part of the city. The peripheral Kefetegnas tend to have bakeries with lower capacity and current production. Fig.7 also shows that Kefetegnas 12,3,1,14 and 25 had relatively low capacity utilization ratios (i.e. 26,34,38,44 and 47 percent respectively). In each of these Kefetegnas (with the exception of 12 and 25) bread production is dominated by private bakeries. Examination of Figs.6 and 7 also reveals that most of the city's private bakeries are located in the central Kefetegnas, whereas most of the public bakeries are located in the peripheral ones.

Fig.7

Kefetegna Bread Production Capacity Utilization 1987/88



The highest utilization ratios were in Kefetegnas 17 (94%), 21 (82%), 18 (80%) and 22 (80%), since important government bakeries and several modern private ones are located in these Kefetegnas (Fig. 6 & 7). Location is an important component of any commercial system, especially in one such as a food supply system. For example, "Where the Pattern of distribution of the retail outlets is dispersed it can be said that the great majority of the people in the low and middle income areas have relatively easy access to the supply points "(eg. Sporrek A, 1985, 130). In the case of bakery location in Addis Ababa, the writer's expectation based on preliminary field observations, was that it would approach complete nucleation. To test this hypothesis the researcher calculated the nearest neighbour index values for Addis Ababa as a whole, for the five Ketanas and for the 25 Kefetegnas of the city (Table 11 and Appendix V). It was expected that the nearest neighbour index would have Rn. values between 0 and 0.43*.

When Rn was calculated for Addis Ababa as a whole, the sub-patterns of bakery-spacing within the city were hidden and thus it was necessary to calculate the values of Rn. at the Ketana and Kefetegna levels. Such a procedure is recommended by Hammond who argues that at large scales the

Note: * Rn 0 - 0.43 = Clustered spatial pattern.
Rn 0.44 - 0.86 = More clustered than random.
Rn 0.87 - 1.29 = Random.
Rn 1.30 - 1.72 = More uniform than random.
Rn 1.73 - 2.15 = Uniform.

values of Rn. "Averages out sub-patterns which may exist within the area and may there by hide contrasting sub-patterns, which cancel each other out...." (Hammond & McCullagh, 1985,273).

Table 11
Nearest Neighbour Index and Z-score Values
For Bakeries, City-wide and Ketana Levels
(1987/88)

Location #	No. of Bakeries	Rn values	Z-score values	Spatial Pattern
Addis Ababa Total	201	0.6078	-10.61119***	More Clust-ered than random
Ketana 1	73	0.6897	- 5.079166***	" "
Ketana 2	27	0.7396	- 2.58529 ***	" "
Ketana 3	30	0.6308	- 3.87054 ***	" "
Ketana 4	27	0.6449	- 3.529438****	" "
Ketana 5	43	0.8759	- 1.5572 *	Random

Source: 1. Ministry of Domestic Trade, Addis Ababa, 1987/88.
2. Field work, A.A., 1987/88.

Note:-
* Less than 1.96, No Significance
*** Over 2.58, Significant at 99% level.
** All calculation are added by the researcher.
# Refer to Appendix V for Kefetegna level and more detailed Rn., Z-Score values.

The nearest neighbour analysis of the location of bakeries for the city as a whole yielded an Rn values of 0.61 which was higher than expected. This value describes a location pattern which is more clustered than random. At the Ketena level the values of Rn ranged from 0.63 to 0.89 indicating a pattern which is more clustered than random in

Ketenas 1,2,3 and 4 (See Table 11). In Ketena 5 however, the location pattern could be described as random (Rn = 0.88).

The results of the nearest neighbour analysis at the Kefetegna level indicates considerable spatial variations in the location pattern of bakeries. In some parts of the city the location pattern deviates far from the researcher's prediction. For example in Kefetegna 14 (Rn = 1.82) the pattern tends towards uniformity. In Kefetegnas 9 and 6 (Rn 1.31 and 1.3 respectively), the pattern is more uniform than random, while in Kefetegna (Rn=1.25), the pattern is random.

Kefetegnas with Rn values in the range of 0.87 and 1.29 are 4 (0.99), 5(1.1) , 20 (1.25) , 22(1), 15 (1.1), 16 (1), 18 (0.89), 2 (1.0), 13 (1.02), 1 (1.1), 8(1.2) and 10 (1.2). Bakery distribution pattern within these Kefetegnas is random.

The only Kefetegnas where the Rn values approaches the predicted ranges were Kefetegnas 24,23,17,19,11 and 12. Significantly there were no Kefetegnas where the bakery location pattern corresponded to the predicted clustered pattern (i.e Rn = < 0.43).

The statistical significance of the calculated Rn values were then tested using the modified Z-test recommended by Hammond and Mc Cullagh (1985, 274-275). The results of the two tailed Z-test, confirmed the significance of the results. The probability that the spatial patterns

are different from those summarized by the Rn statistics is less than one a one thousand (See Appendix V).

The results of the nearest neighbour analysis therefore, lead the writer to reject his hypothesis concerning bakery location. The values of Rn fall outside the predicted range at the three spatial scales (city-wide; Ketena; Kefetegna) at which the analysis was conducted. At the Kefetegna scale the biggest deviations from the predicted clustered pattern were in Kefetegnas 14 (and to lesser extent) 9,8,20 and 6. These districts tend to have lower population densities. Kefetegnas 9 and 6 are central but 8 and 20 are peripheral. Kefetegnas 9,8,20 and 6 have areas 2.6 km^2, 14.1 km^2, 7.2 km^2, and 1.9 km^2 respectively. The Addis Ababa average is 8.9 km_2. The Rn values in most of the city's Kefetegnas are less than 1. The result come closest to the writer's prediction in Kefetegnas , 24, 23, 17, 19, 11 and 12. All of these are relatively big in area and peripheral. By contrast, the densities of population are low.

TABLE 12
AMOUNT OF TOTAL POPULATION AND ESTIMATES OF LOW-INCOME POPULATION FOR 1986, IN ADDIS ABABA

Ketena	Kefetgna	Total Population		Estimates of low-income population	
		No.	%	No.	%*
	4	65,809	4.7	34,221	52
	5	75,386	5.3	30,908	41
1	6	65,698	4.7	32,192	49
	24	64,436	4.6	7,732	12
	25	46,183	3.2	12,931	28
Sub-total		317,512	22.5	117,984	37
	3	70,634	5.0	33,904	48
	20	56,262	4.0	15,753	28
2	21	76,377	5.4	26,732	35
	22	32,127	2.3	11,245	35
	23	59,254	4.2	8,296	14
Sub-total		294,654	20.9	95,930	33
	15	56,918	4.0	22,198	39
	16	53,485	3.8	13,906	26
3	17	57,284	4.1	5,256	9
	18	47,274	3.4	14,182	30
	19	54,223	3.8	13,014	24
Sub-total		269,184	19.1	68,456	25
	2	35,772	2.5	11,805	33
	11	65,687	4.7	21,677	33
4	12	43,312	3.0	7,796	18
	13	50,734	3.6	18,264	36
	14	52,465	3.7	27,807	53
Sub-total		247,970	17.5	87,349	35
	1	45,110	3.2	21,202	47
	7	73,308	5.2	35,188	48
5	8	60,857	4.3	15,823	26
	9	45,615	3.2	25,088	55
	10	57,008	4.1	15,962	28
Sub-total		281,898	20	113,263	40
Addis Ababa total		1,411,218	100	482,984	34

Source: Addis Ababa City Council, 1986.

* From the respective Kefetgna population

C H A P T E R IV

THE BREAD DEMAND, TRANSPORT AND RETAIL SALES SYSTEMS

4.1 BREAD DEMAND

4.1.1 Population Growth, 1961-88

In 1971 the estimated population of Addis Ababa was 858,300 with a yearly growth rate of 7% (CSO, 1972, 1). By 1983/84 the population had grown to 1,423,473 and (1987/88) it was 1,654,862 (Appendix VI).

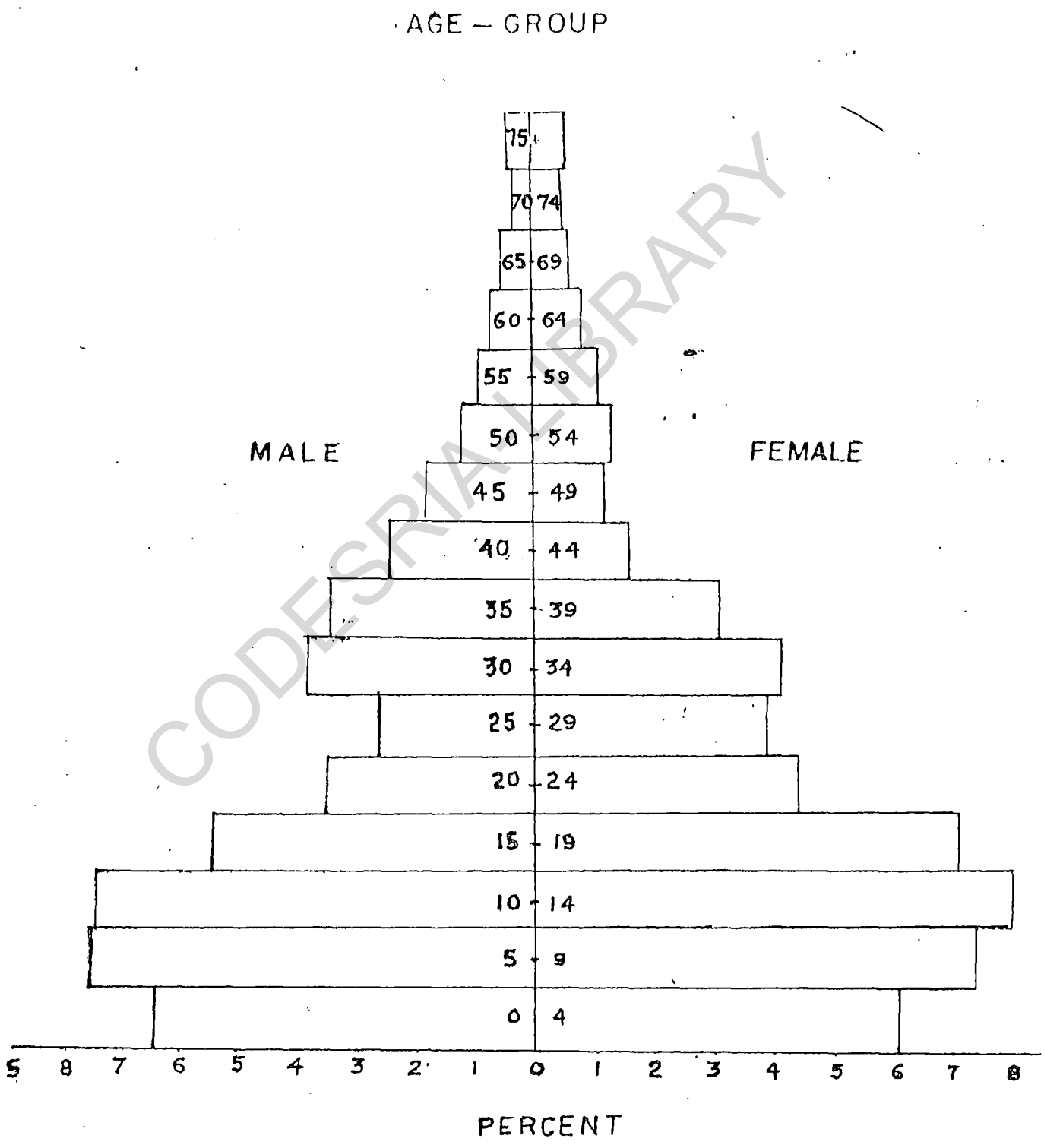
Table 13
Population Growth Rates at Different Periods For Addis Ababa

Period	Average Annual Population Growth Rates (%)
1961 - 1967	7.0
1961 - 1978	5.8
1967 - 1978	5.0
1961 - 1984	5.1
1967 - 1984	4.4
1978 - 1984	3.4

Source:- CSO, Population and Housing Census of Ethiopia in 1984, Vol.1, No 1, January 1987, P.266.

The growth of the city population was very rapid in the 1960's (7.0% per annum between 1961-1967) but thereafter it started to slow down, reaching 3.4% per annum between 1978-

FIG. 8 ADDIS ABABA POPULATION PYRAMID



1984. Recent estimates, however, suggest that since 1984, growth has been 3.9% per annum (CSO, 1988/89).

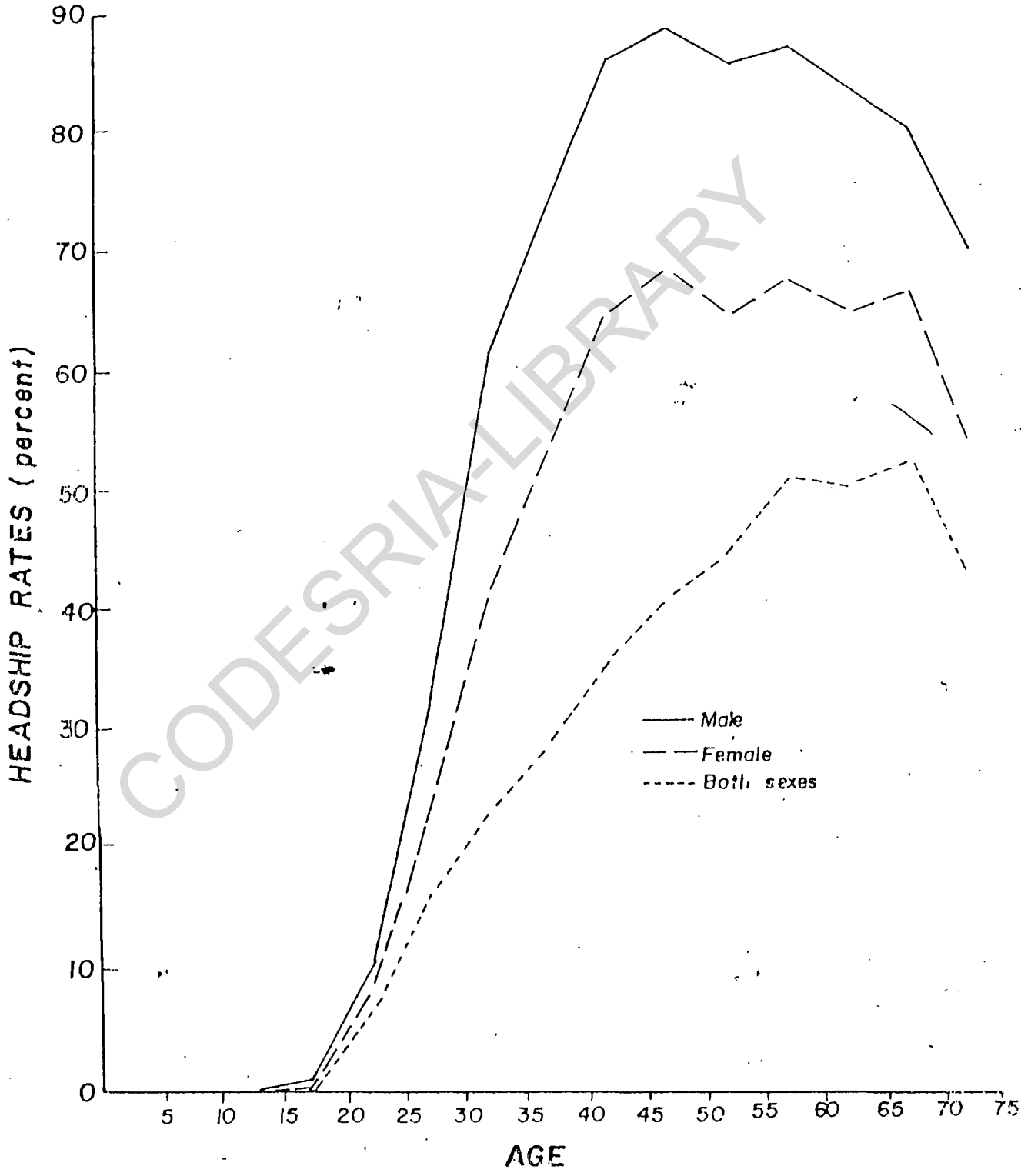
4.1.2 Population Distribution

More important for the purpose of this paper than population size are data concerning the spatial distribution of population. The researcher has also made use of data showing the location of the city's low income population at the Kebele and Kefetegna levels for the year 1986 (See Table 12).

Table 12 shows that the proportion of the low-income population is generally smaller in the peripheral Kefetegnas such as Kefetegnas 24,25,23,17,12 and 8. These peripheral districts have populations above the size of the average Kefetegnas, (57,000) and although they are areas of relatively rapid population growth, they are characterized by relatively low population density (Table 12 and Fig. 11).

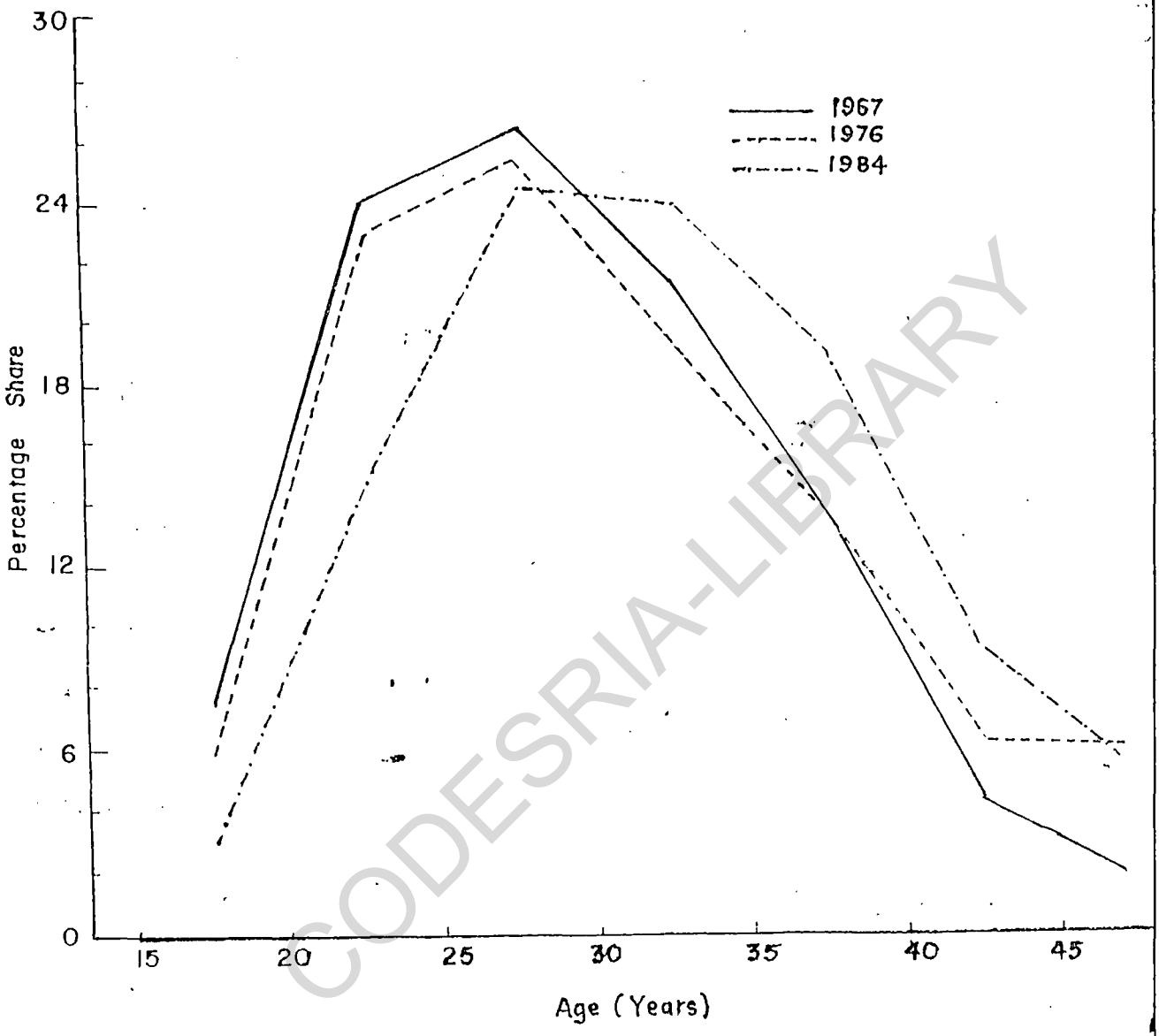
The poorest segments of the city's population (as observed from the Table 12 and Fig.4) are mainly found in the Kebeles close to the centre of the city eg. in Kefetegnas 9,14,4,6,3 and 1. As was noted in chapter I (above) the low income populations are more vulnerable during periods of cereal scarcity and price inflation. From this one could reasonably conclude that significantly more of the city's bread consumers live in the central Kefetegnas, than in the larger, sparsely settled outer

FIG-9 AGE SEX SPECIFIC HEADSHIP RATES



Source:- OPHCC, Population and Housing Census of Ethiopia, 1984, Addis Ababa, Jan. 1987

Figure 10 AGE SPECIFIC FERTILITY RATES (PERCENTAGE SHARE IN EACH AGE GROUP) 1967, 1978 AND 1984



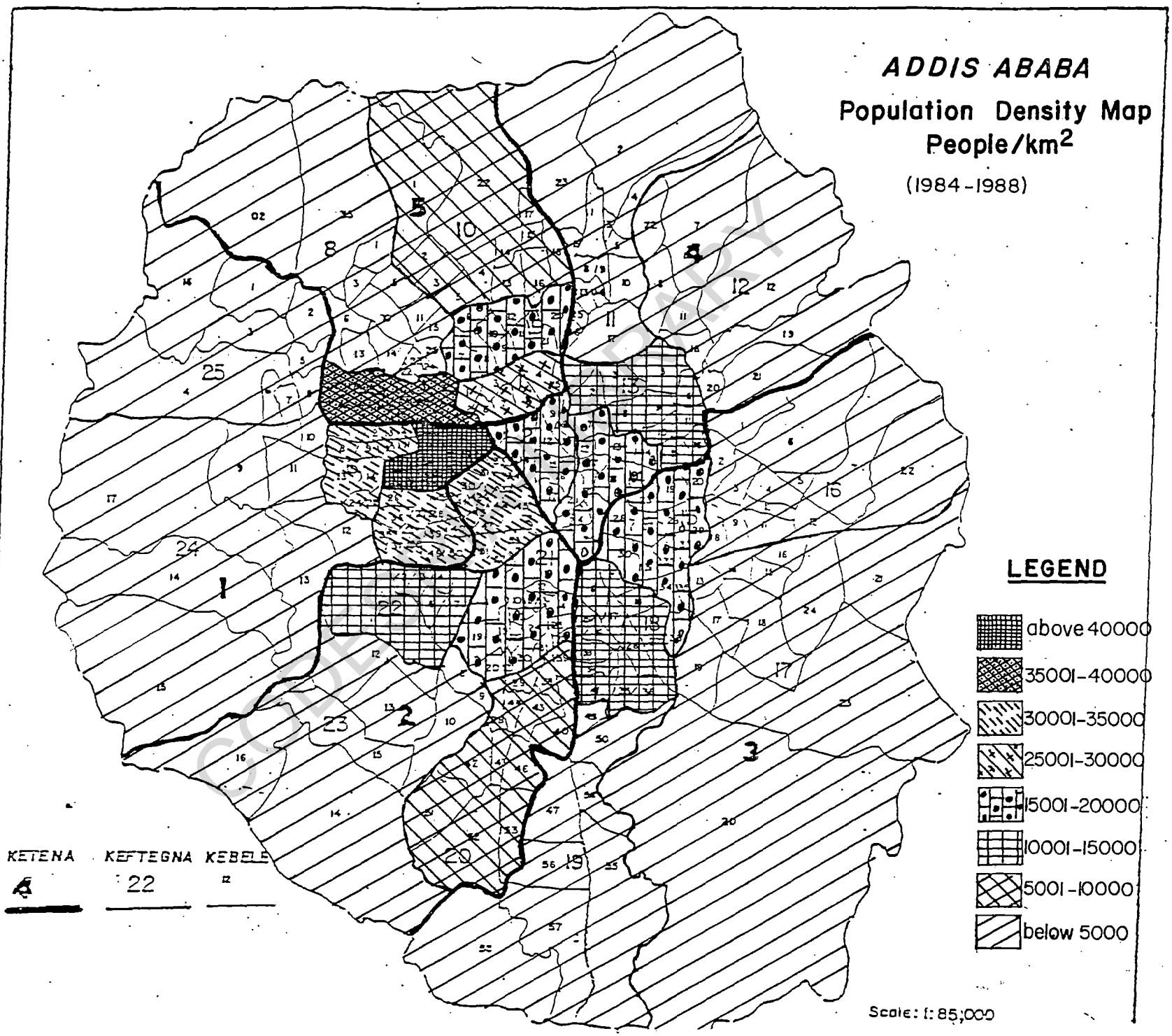
urce: OPHCC, Population and Housing Census of Ethiopia, 1984, Addis Ababa, Jan. 1987 Page 186

Kefetegnas. Moreover bread distribution is easier in the central Kefetegnas, because most of the city's private bakeries are here and the distance from the bakeries to the Kebele shops are not long. (See Section 4.3 below).

4.2 ADMINISTRATIVE ALLOCATION OF BREAD SUPPLIES

4.2.1 Supply Allocation Process

The bread supply allocation process in Addis Ababa involves the Ministry of Domestic Trade, the Ministry of Industry (represented by EFC and Hasida), the Ministry of Internal Affairs, Addis Ababa Municipality and the Prison (Bakery) Administration. These ministries and organizations are the members of a committee known as "National Flour Allocation and Bread Production, Distribution Follow up Committee" (See Chapter 3, Section 5). It began operation in November, 1984 since then it has controlled the allocation of bread which is sold by the 284 Kebeles shops in the city. Under its control are 45 modern private bakeries, 3 Kenema bakeries 44 Kebele bakeries and the 7 church bakeries (See Chapter III Section 4). Tea house bakeries excluded, these bakeries represent only 49 percent of the bakeries in Addis Ababa (Tea house bakeries in Addis Ababa represent fifty one percent of the bakeries in the city


ADDIS ABABA
Population Density Map
People/km2
(1984-1988)
LEGEND
above 40000
35001-40000
30001-35000
25001-30000
15001-20000
10001-15000
5001-10000
below 5000
KETENA
KEFTEGNA
KEBELE
4
22
12
Scale: 1:85,000

are thus outside the control of the quota allocation committee).

In terms of attainable capacity and current production, however, the bakeries under the control of the committees are more important. They represent 65 percent of capacity and 63 percent of total daily production.

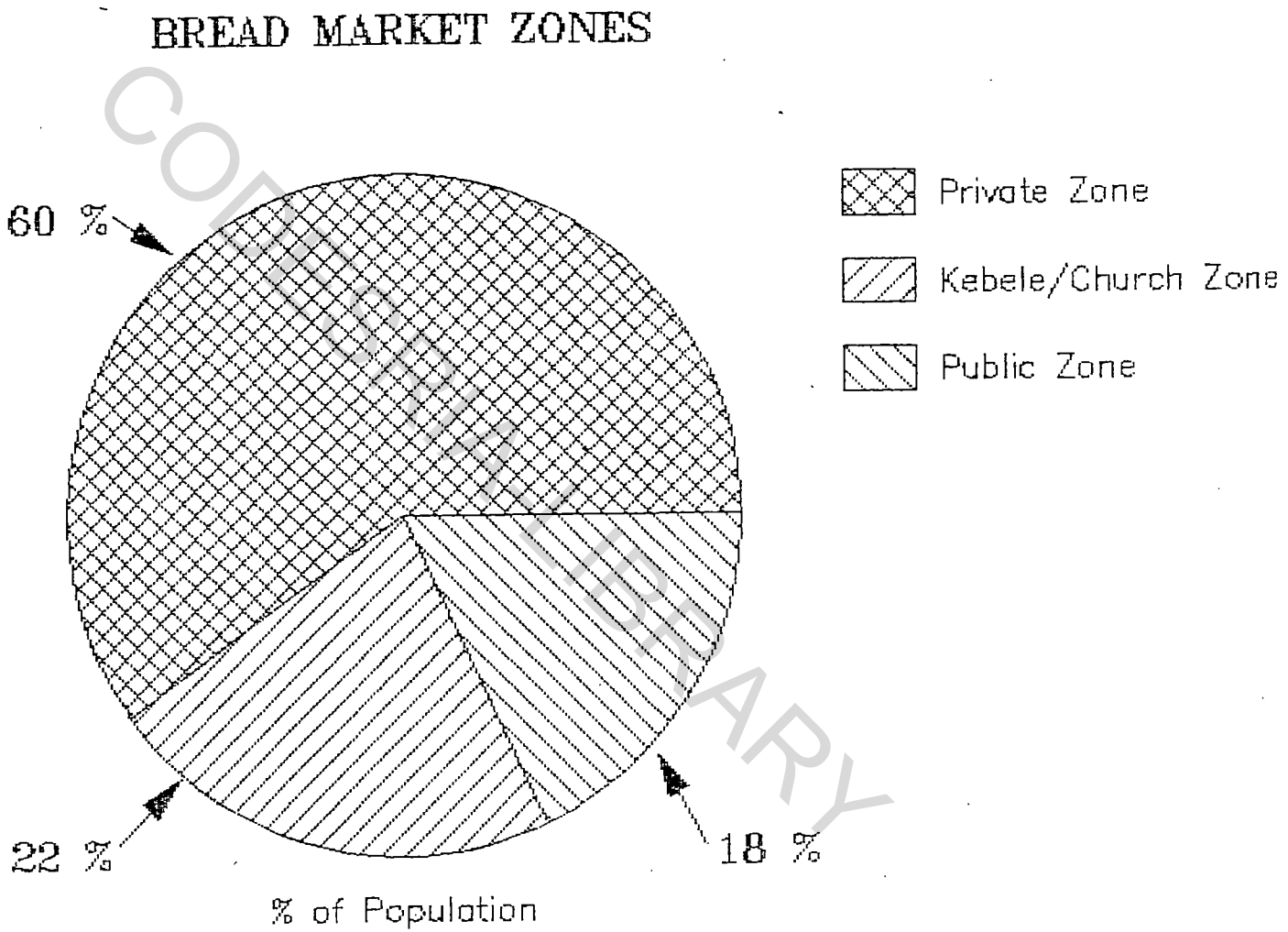
4.2.2 Spatial Structure of the Bread Supply Allocation System

The supply allocation committee has divided the city into three broad supply zones, each of which (roughly) corresponds to types of bakery ownership in Addis Ababa. According to the data for 1986 over 120,000 kg/day of bread is allocated by the MDT for distribution to Kebeles through out the city.

4.2.2.1 Private Bakery Supply Zone

The 45 private bakeries have the biggest responsibility, since they have been allocated the task of producing 62 percent of the bread quota needed by the Kebele shops. They also have to supply the largest portion (60%) of the city's population and the area of the Private supply zone is also the biggest (48% of the city area). The area allocated to the private Bakeries also includes the biggest portion of the city's low-income dwellers (Table 14). It should be noted that there are 366 private sector bakeries in

Fig. 12



Addis Ababa. The government's production quota allocation system, however, ignores 321 of these, i.e. the 224 tea-house bakeries and 97 brick -oven bakeries. These bakeries produce 10,563 kg/day and 24,500 kg/day respectively, which they sell without government regulation, through free-market channels. The 45 remaining Modern private bakeries are thus the sole distributors of bread on the Private Bakery zone illustrated in Fig. 14 and Table 17.

These modern 45 bakeries have current attainable capacity of 129,758 kg/day (36%) of all bakeries and a current production 75,710 kg/day (35%) of the city total. The modern private bakeries are thus producing at only 58.3 percent of capacity (Table 3).

The private bread market zone, however, contains 60 percent of the Addis Ababa population and the zone covers 106.32 km², mostly in the central part of the city (Fig.14). Many of the oldest bakeries in the city are located within this zone. This zone also extends to the peripheral parts of the city were the Kebele, church and Kenema bakeries fail to meet the demand. The 45 modern private bakeries have thus been allocated the task of supplying Ketanas 1,2,3,4 and 5 with 14,232, 16,595.5, 15,968.5, 14,819.5 and 13,995 kg/day respectively (Table 17).

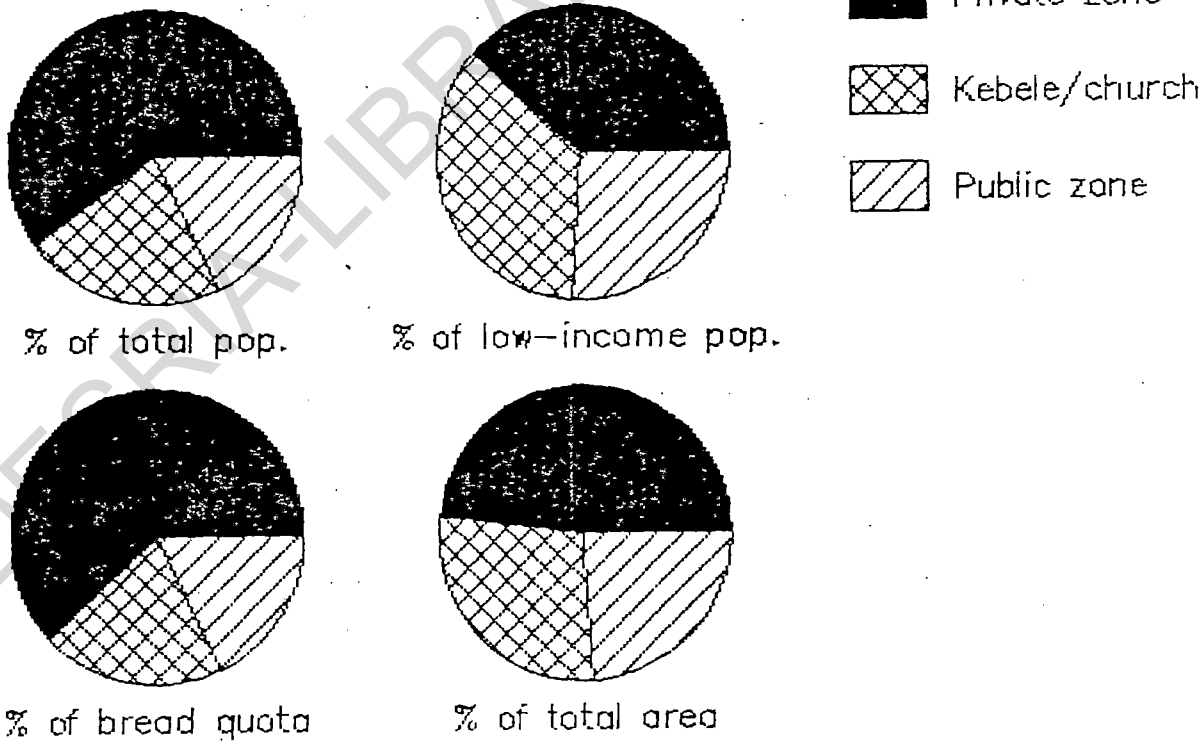
Table 17
Private Bakeries Bread Market Zone

Zone/ Kefet-gna		Population		Low Income Population		Bred Quota kg/day		Pcc kg/ Yr	Area km²	
		No.	%	No	%	No	%		No.	
	4	43653	66	17826	41	3737.5	67	31	1.58	.8
	5	52879	70	19429	37	4487.5	70	31	1.12	.5
1	6	43917	67	20212	46	3775.0	67	31	1.2	.5
	24	19945	31	2393	12	1650.0	30	30	0.82	4.4
	25	--	-	--	-	--	-	-	--	-
Sub Total		160394	51	59860	37	14232	49	31	13.79	6.2
	3	70634	100	33904	48	6137.5	100	31	2.3	1.0
	20	11497	20	2172	19	962.5	21	30	1.3	.6
2	21	66300	87	23104	35	5575	87	30	3.65	1.6
	22	32127	100	11245	35	2700	100	30	2.22	1.0
	23	7773	13	156	2	638.5	13	30	3.0	1.4
Sub Total		188331	64	70581	38	16595.5	65	32	12.47	5.6
	15	40830	72	17372	43	3437.5	72	30	2.98	1.4
3	16	7002	13	1936	28	650	14	33	1.16	.5
	17	49232	86	5075	10	4125	86	30	38.05	17
	18	38510	71	9714	25	3200	71	30	9.05	4.1
Sub Total		182848	69	48279	26	15968.5	68	31	55.49	25
	2	35772	100	11805	33	3300	100	33	1.99	1.0
	11	42290	64	16530	39	3525	63	30	4.15	1.8
4	12	21771	50	3594	17	2001	52	33	9.24	4.2
	13	16927	33	8798	52	1537.5	36	33	1.00	.5
	14	41610	79	22488	54	3875	80	34	2.5	1.0
Sub Total		158370	64	63215	40	14819.5	65	34	18.88	8.5
	1	22022	49	10799	49	1862	49	30	.66	0.3
	7	65975	90	31375	48	5787.5	90	32	1.89	0.9
5	8	30919	51	10092	33	2650	50	31	1.6	0.7
	9	20421	68	10932	54	1687.5	44	30	1.06	0.5
	10	9615	17	2922	30	800	15	30	.48	0.2
Sub Total		148952	53	66120	44	13995	54	34	5.69	2.6
Addis Ababa Total		838895	60	308055	37	75610.5	62	32	106.32	48

Source: Ministry of Domestic Trade and Addis Ababa Municipality.

Fig. 13

BREAD MARKET ZONES – 1986



4.2.2.2 Kebele and Church Bakery Supply Zone

The second biggest market zone is that supplied by the 51 Kebele and Church bakeries. They distribute 20 percent of the total bread quota for the city (Table 14), to an are of 61.24 km² (28% of the city) (Table 14 and Fig.15). Many of the Kebeles supplied by the

Table 14
Private, Kebele - Church and Public
Bread Market Zones Proportion (1986)

Market Zones	Population		Low-Income Population		Bread Quota Kg/day		Pcc Kg Year	Area Km².	
	No.	%	No	%	No.	%		No.	%
Private Bread Market Zones	838,894	60	308,055	38	75,610	62	32	106.32	48
Kebele Church Bread Market Zones	306,748	22	105,936	36	24,390	20	29	61.24	28
Public Bread Market Zones	265,576	18	68,893	26	21,951	18	30	54.48	24
Addis Ababa Total	1,411,218	100	482,884	100	121,051	100	31	222.04	100

Source:- Ministry of Domestic Trade and EFC.
Calculation Added.

bakeries are located on the city's periphery (Fig.12). Several are newly established bakeries, because the number

Fig. 14

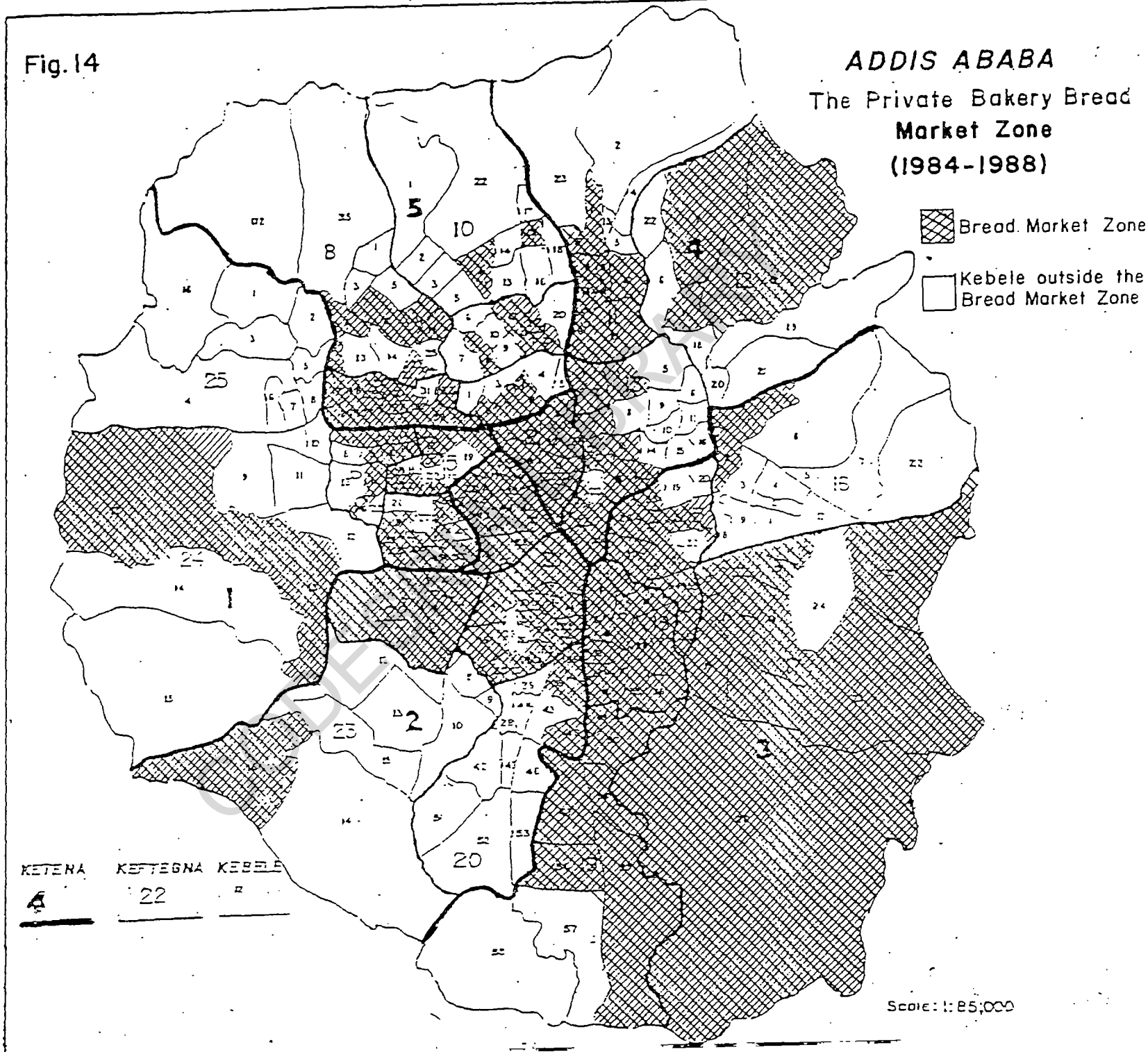

ADDIS ABABA
The Private Bakery Bread
Market Zone
(1984-1988)
Bread Market Zone
Kebele outside the Bread Market Zone
KETENA
KEFTEGNA KEBELE
4
22
Scale: 1:85,000

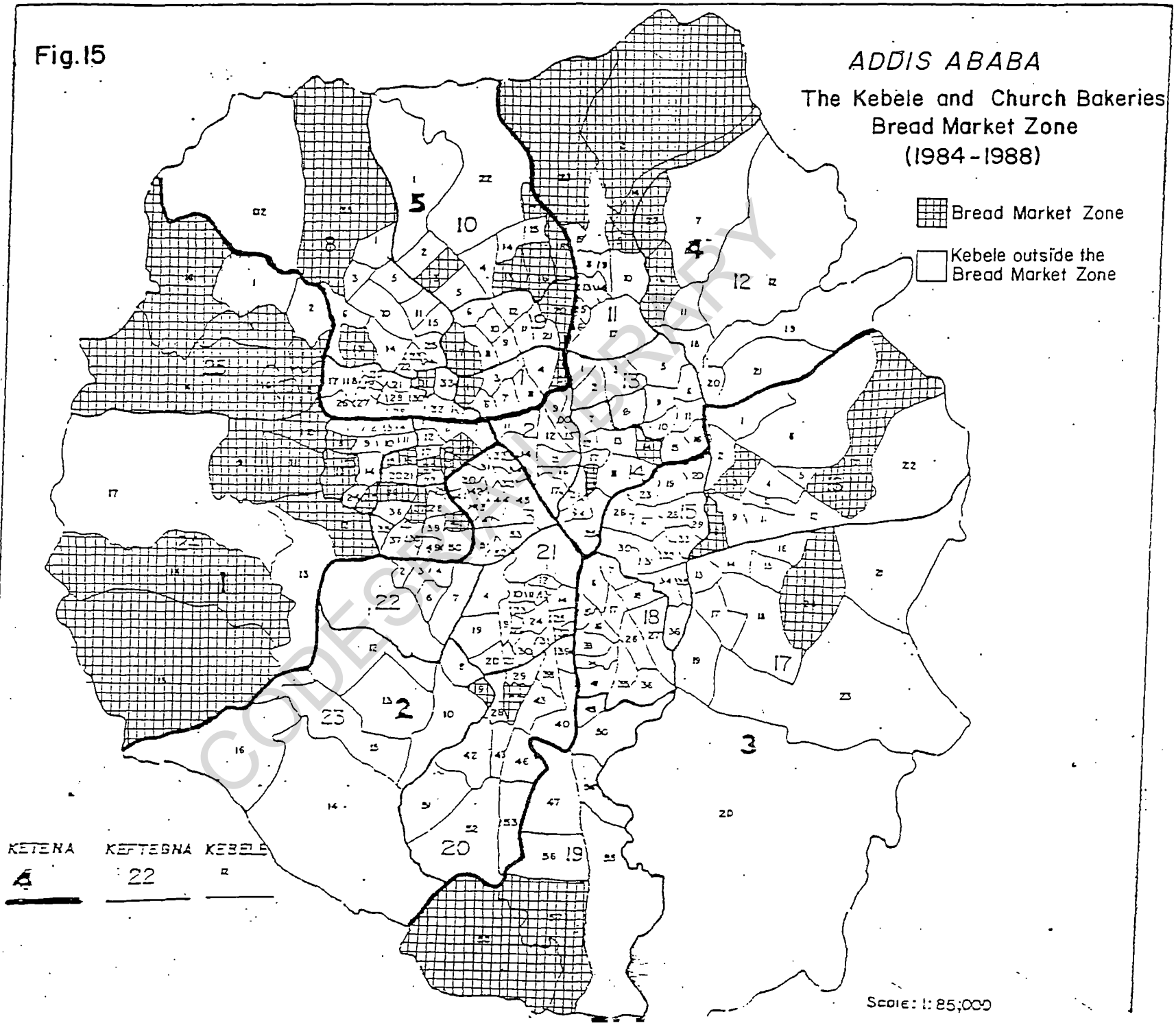
Table 15
Kebele and Church Bakeries Bread Market Zone

Zone/Kefetegna		Populuation*		Estimated Low Income Population Ratio		PCC in Kg/Yr	Area in Km²		Bread Quoin Kg/Day	
		No	%	No	%		No	%	No	%
1	4	22,156	34	16,395	74	31	0.48	.2	1,865.0	33
	5	22,506	30	11,479	51	27	0.50	.2	1,902.5	30
	6	21,782	33	11,980	55	29	0.70	.3	1,815.0	33
	24	44,491	69	5,339	12	27	17.60	8.0	3,815.0	70
	25	38,014	82	10,264	27	29	10.30	4.3	3,188.0	80
Sub Total		148,949	47	55,457	37	29	29.58	13	10,710.5	38
2	20	7,486	13	2,770	37	31	0.20	0.1	600.0	14
	23	4,616	8	1,800	39	28	0.20	0.1	360.5	8
Sub Total		12,102	4	4,570	39	30	0.40	0.2	960.5	4
3	16	13,415	25	4,695	35	33	3.32	1.4	1,207.0	27
	17	8,052	14	81	1	28	1.60	.7	658.0	14
	19	15,713	29	3,300	21	29	6.36	2.9	1,295.5	29
Sub Total		37,180	14	8,076	22	30	11.28	5.0	3,160.5	14
4	11	23,397	36	5,147	22	31	10.52	4.8	2,057.0	37
	12	6,443	15	1,031	16	36	1.20	0.5	645.5	17
	14	10,855	21	5,319	49	31	0.30	0.1	983.0	21
Sub Total		40,695	16	11,497	28	33	12.02	5.4	3,685.5	17
5	1	10,756	24	5,593	52	30	0.32	0.1	890.0	24
	7	7,333	10	3,813	52	27	0.16	0.1	615.0	10
	8	11,541	19	1,500	13	29	5.04	2.8	1,015.5	19
	9	13,927	31	8,635	62	29	0.92	0.5	1,150.5	30
	10	24,266	43	6,795	28	32	1.52	0.9	2,202.5	41
Sub Total		67,823	24	26,338	39	30	7.96	4.4	5,873.0	21
Addis Total		306,749	22	105,936	35	29	61.24	28	24,390.0	20

* Population No. is of 1986
% is of each Kefetegna total for population and bread quota, area as well.

Sources:- 1. Population bread quota = Ministry of Domestic Trade.
2. Area = CSO, Calculation added.

Fig.15



of private bakeries is very low in their neighbourhoods. Twenty two percent of the total city population and 35 percent of the low income population get their bread from Kebele and Church bakeries (Table 14). The attainable daily capacity of the 7 church bakeries represents 4 percent of the city total and that of the 44 Kebeles bakeries 13 percent (Ministry of Domestic Trade and EFC., 1987). Their current production (1988) was 7,400 kg/day (church) and 22,625 kg/day (Kebele) (Table 5).

It should be noted that not all of the bread produced by these bakeries is allocated to Kebeles within this bread market zone. The church bakeries, for example supply some of their production to priests. The nearby rural dwellers also get bread from the Kebele bakeries in the peripheral Kefetegnas. Despite this it was pointed out by the chairman of Kefetegna 10 though data were not readily available to prove it that bread consumption is much higher in the peripheral Kefetegnas, where the newly established bakeries are locate, because people have fewer choices of food than in central Kefetegnas where one finds more groceries & food shops.

4.2.2.3 The Municipality-Owned (Public) Bakery Supply Zone

The smallest of the three bread supply zones, is that supplied by the municipality-owned bakeries (Table 14).

Table 16
Public Bakeries Bread Market Zone

Kefete-gna	Population		Low Income Population Ratios		Bread Quota in kg/day		PCC in Kg/Yr	Area in km²	
	No.	%	No.	%	No.	%		No.	%
25	8169	18	1879	23	712.3	18	28	1.75	.8
Sub Total	8169	18	1879	23	712.3	18	28	1.75	.8
20	37279	66	10811	29	2967	65	40	5.71	2.3
21	10077	13	3628	36	792	13	43	.22	.1
23	46865	79	7030	15	3741	79	41	15.00	7.0
Sub Total	94221	32	21469	23	7500	31	41	20.93	9.4
15	16088	28	4826	30	1262.5	28	29	0.72	.4
16	33068	62	7275	22	2625	59	29	8.06	3.6
Sub Total	49156	18	12101	25	3887.5	18	29	8.78	4.0
12	15098	35	3171	21	1175	32	27	4.12	1.8
13	33807	67	9466	28	2687.5	64	26	2.69	1.2
Sub Total	48908	20	12637	26	3863.5	18	27	6.81	.3
1	12332	27	4810	39	1050	28	29	0.56	.3
8	18397	30	4231	23	1575	30	34	7.42	3.2
9	11267	25	5521	49	920	26	33	.6	.3
10	23128	41	6245	27	2412.5	45	31	7.67	3.2
Sub Total	65124	23	20807	32	5987.5	25	32	16.25	7
Addis Total	265524	19	68893	26	21951	18	31	54.48	24

Source: Ministry of Domestic Trade and Addis Ababa Municipality.

* Percentages of population, Bread quota are calculated from each kefetegna total, 1986.

This market zone is supplied by Kenema bakeries-No.1,2 and 3, located in Kefetegnas 9, 13 and 23, respectively. Each bakery has an attainable capacity of 12,500 kg/day, but is limited to 10,000 kg/day (Table 3) due mainly to flour shortages. These three bakeries cover a large portion of Addis Ababa, 54.48 km² (24%), containing 265,578 bread consumers (19%), of whom 68,893 (26%) were in the low income bracket (Table 16 and Fig.16). Each bakery serves its own sub-zone, thus the municipality (Public) supply zone consists of 3 sub-zones (See Fig.16).

4.3 BREAD TRANSPORT SYSTEM

4.3.1 Aggregate Volumes and Modes of Transport

According to the quota set by the Ministry of Domestic Trade in 1985, over 120,000 kg/day (or over 36,000 quintals/month) have to be transported from the bakeries to the Kebele shops. The writer's survey of the 284 Kebeles in the city indicate that the task of delivering the bread to the shops is mainly the task of the Kebeles, which pay the transport costs in 95 percent of the cases. A small number (14) pay this bread transport costs by community fund raising (Table 18).

Fig.16

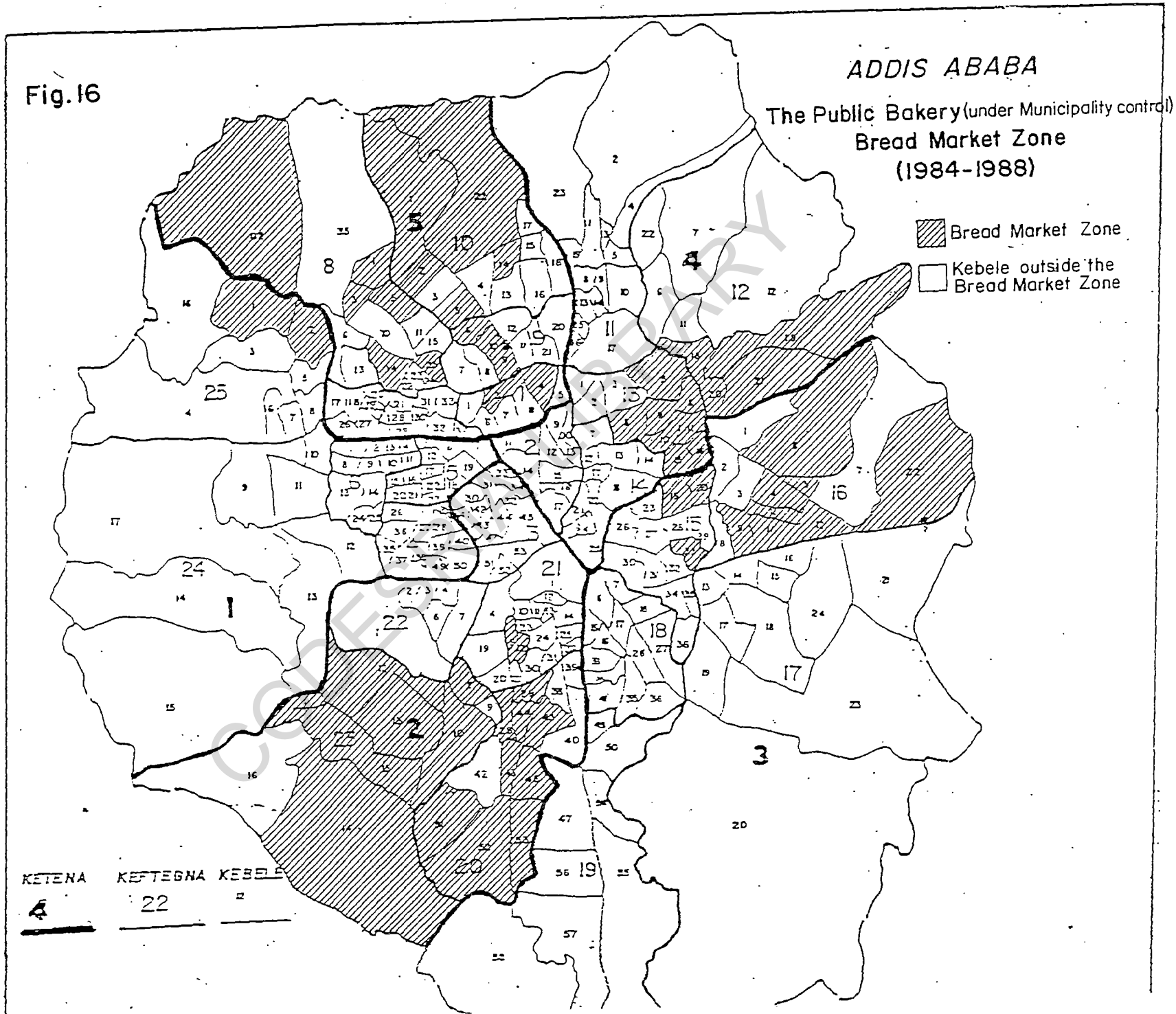


Table 18
Organizations Involved In The Transport Task

Organizations Involved	Number of Kebeles	Share (%)
1. Kebele Office	193	68.1
2. Kebele Bakery	77	27.0
3. The community (by raising funds)	14	4.9
Total	284	100

Source: Questionnaire III,1988, Addis Ababa

Three modes of Transport are used by the Kebele shop officials, porters (foot); Kushenet (wheel-barrow) and vehicles (taxis, vans, pick-up trucks) Table 19 shows that, of these, foot-transport is the most widely used (64 percent of the Kebeles), with vehicles next (26 percent) and Kushenet last (11 percent). (This situation seems to be true for most of the bread retailers in the city, since the bread out lets outside the government-controlled distribution scheme seem to use these methods of transport in similar proportions Table 19).

Table 19
Type of Transport Used By Kebele Shops

Means of Transport Used	Number of Kebele Shops Involved	Shares in Percent
On foot	181	63.73
"Kushenet"	30	10.63
Vehicle(Taxies, Pick-up vans)	73	25.70
Total	284	100.06

Source: Field work, questionnaire II, Addis Ababa, 1988.

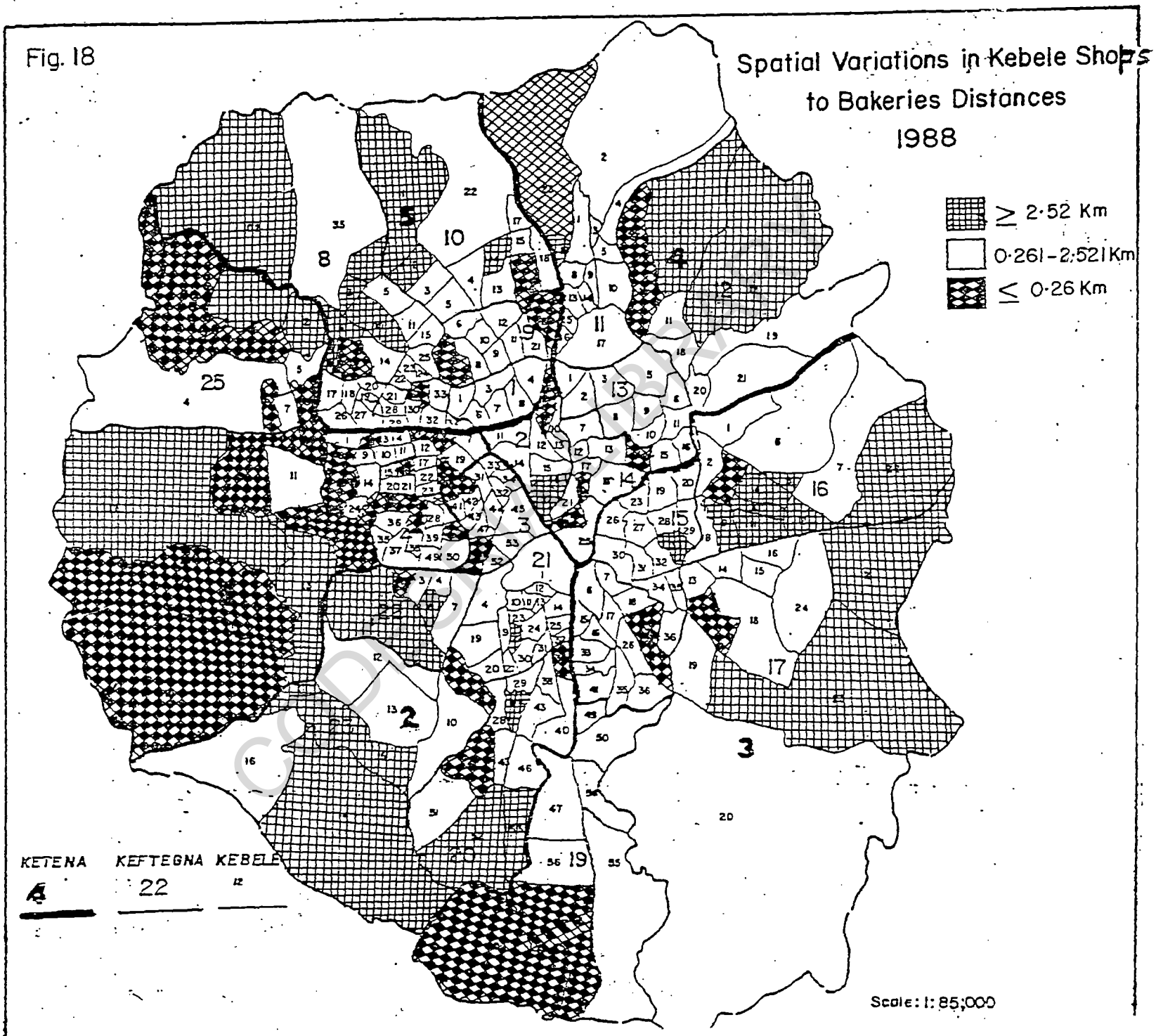
4.3.2 Bread Delivery Route Lengths

The researcher's field survey and subsequent map-work indicate that the 281 Kebeles which transport bread by foots, cover over 275 km/day (on a two-way basis). The average foot-trip, is about 1.5 km. This indicates that the average distance (one-way) between the Kebele shops, which transport bread by foot, and their supplying bakeries is about 0.75 km.

In the case of Kushenet, the survey indicates that the total distance covered was almost 106 km/day (on a 2 way basis), the average trip per Kebele being about 3.5 km. The average distance between bakery and the Kebele shops which use wheel-barrow thus seems to be slightly over 1.76 km.

As for vehicle bread deliveries the survey revealed that the total distance (2-way) covered was almost 430

Fig. 18


Spatial Variations in Kebele Shops to Bakeries Distances 1988
≥ 2·52 Km
0·261 - 2·521 Km
≤ 0·26 Km
KETENA
KEFTEGNA KEBELE
Scale: 1: 85,000

km/day. The average 2-way trip was thus 589 km, indicating that averages bakery-shop route- length for the 73 Kebeles, which used vehicles to collect their bread, was 2.94 km.

The maximum distance travelled by Kebele employees to collect bread from their supplying bakery was 13.9 km (2-way trip) and the minimum distance was 0.1 km (2-way trip). The average distance for the 284 Kebeles was 2.8 km (2 way trip). There were however, considerable variations in trip length. These have been recorded on Fig. 18. Forty Kebeles (14%) were in upper extremes (X + 1 SD or more). Most of these Kebeles with relatively long delivery routes obtain their bread from the municipality bakeries in Kefetegnas 23,13, and 9. These Kebeles are mainly on the fringes of the city.

By contrast the 47 Kebeles (16%) with relatively short bread route (X - 1 SD or More) tend to be found in south-west, south-east and north-west parts of the city and often have their own bakeries (Fig.18).

4.3.3 Estimated Transport Costs

The writer's questionnaire survey of the 284 Kebeles revealed that most of the Kebeles did not keep detailed records of their expenditures on transport. This was especially the case for the Kebeles who used porters to deliver bread. The data on foot-transport costs are thus crude estimates provided by the Kebele officials. These

suggest that the 181 Kebeles which used porters spent almost 25,000 Birr/month or 1.5 cents/quintal/km. The 30 Kebeles using Kushenet spent an estimated 7,600 birr per month or almost 6.5 cents per quintal/km. The 73 Kebeles which used vehicles spent almost 22,000 birr/month or 1.55 cents/quintal/km. The total monthly transport costs of the city's Kebeles is estimated at almost 54,000 birr, of which porters represented 46 percent, vehicles 40 percent and kushenet 14 percent. Interms of cost per km the survey indicates that the porters were the cheapest mode, followed by vehicles. A surprising finding was that the cost of carrying bread by wheel barrow was four times more costly than transport by vehicle or by porter.

4.4 BREAD RETAIL SYSTEM

4.4.1 Number of Retail Bread Outlets

Bread is sold through a variety of retail outlets in Addis Ababa, such as Kebele shops, government shops, supermarkets, tea-houses bread shops, small private groceries and small neighbourhood markets (gullits). The most important channel for bread sales is the Kebele - shop channel, through which an estimated 56 percent of the bread produced in Addis Ababa is sold. This study is restricted to these 284 Kebele shops.

4.4.2 Kebele Bread Quotas

The amount of bread sold by a Kebele shop depends

on the quota set for the Kebele by the MDT. The MDT uses Kebele population size to determine the quota of bread to be sold by each Kebele and it has fixed the bread quota three times since the introduction of the policy to take account of population growth (i.e. in 1983/84, 1984/85 and 1987/88). In practical terms, however, the 1984/85 quota is still in operation, since the 1988 quota had not been implemented at the time of the study (See Appendix VII).

4.4.3 Spatial Variations in Kebele Bread Quotas

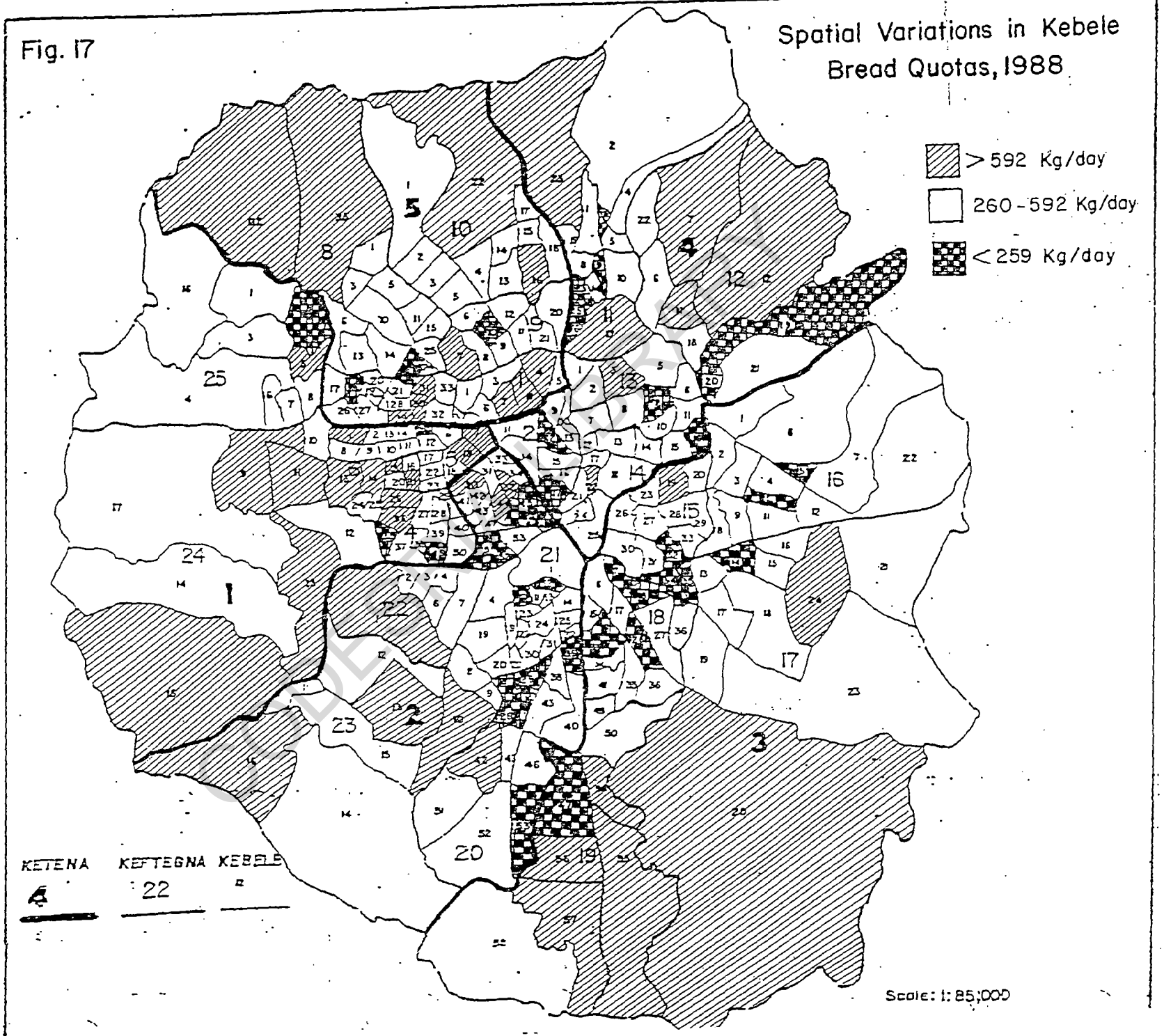
Table 20
Volumes of bread (kg/day) handled; Kebele level in Addis Ababa, 1984, 1985/87, 1988/89

Years	Kebeles	Kg/Day	X	SD
1984	284	106,609.9	375.39	168.4
1985/87	284	121,051	426.2	166.25
1988/89	284	139.001.1	489.44	182.

Source: Ministry of Domestic Trade, 1988, Addis Ababa

Table 20 summarizes the size of the bread quotas for 1984, 1985-87 and 1988-89, while Appendix II provides details for each Kebele, for 1984 and 1985-88. Appendix II shows that there were considerable spatial variations in the Kebele quotas, mainly due to variations in population size (according to 81 percent of the Kebele officials interviewed, population is the main factor in quota use). The writer has used this data to produce Fig.17 There were 47 Kebeles (17%) with relatively big bread quotas (X + 1 SD

Fig. 17


Spatial Variations in Kebele Bread Quotas, 1988
> 592 Kg/day
260 - 592 Kg/day
< 259 Kg/day
KETENA
KEFTEGNA KEBELE
Scale: 1: 85,000

or above) and 43 Kebeles (15%) with relatively small quotas (X -1 Sd or less). The Kebeles with the bigger quotas tend to be those with big populations and which have their own bakeries most of them are located at the south west, north-west, north-east and south, peripheries of the city, whereas the Kebeles with relatively small quotas tend to be centrally located. These Kebeles tend to get their bread from private bakeries.

4.4.4 Hours of Operation and Retail Labour Force

The bakeries open for business at 5 am and the Kebeles collect it between 5 and 6 am. The Kebele shops usually remain open until their bread quota is sold. According to the writer's survey data 53 percent sell bread only in the morning, while 26 percent sell bread

Table 21

Sales Hours Of Bread In the Kebele Shops

Time of Operation	Number of Kebeles Responded	Ratio (%)
1. Only morning hours	149	53
2. After noon and morning hours	76	26
3. As long as it is necessary to sell the daily bread quota	59	21
Total	284	100

Source: Field work, Questionnaire III.

both in the morning and afternoons (Table 21). Twenty one percent indicated that the Kebele shops remained open until all the bread was sold. During the season of peak bread demand the Kebele shops are thus open for only a few hours in the morning (6-8 am).

The survey data indicate that labour cost is a major portion of bread marketing costs in the Kebeles (Table 22). Labour (i.e. salaries, per diem, wages of casual workers for unloading bread) represented over one third of estimated marketing cost and was the second most important cost item after transport (43%). The average Kebele in 1988 was spending about 225 birr/month on labour related to bread marketing (Table 22 and 23).

Table 22
Estimated Marketing Costs of Bread
For 284 Kebele Shops in Birr/month

Catagories	Costs in birr/month	
	Amount	Share (%)
1. Transport	53,371	43.5
2. Salary	42,647	34.7
3. Perdiem	10,023	8.2
4. Loading and Unloading	9,732	7.9
5. Rent for houses	6,956	5.7
Total	122,729	100

Source: Field work, Questionnaire III.

Table 23
Distribution of Estimated Bread Marketing Costs Of 284 Kebele Shops

Amount in birr/month	Based on wages of workers		Based on Perdiem		Based on Transport Cost		Based on Loading & Unloading Expenses		Based on Unspecified bills		Total Expenses	
	Kebeles	%	Kebeles	%	Kebeles	%	Kebeles	%	Kebeles	%	Kebeles	%
Less than 100	177	62	50	78	103	36	228	80	20	53	29	10
101-200	76	27	12	19	93	33	32	12	9	24	69	24
201-400	13	4.5	2	3	80	28	12	4	5	13	127	45.5
401-600	5	2	—	—	6	2	—	—	2	5	32	11
over 600	13	4.5	—	—	2	1	12	4	2	5	27	9.5
Total	284	100	64	100	284	100	284	100	38	100	284	100

Source :- Field Work, Questionnaire III, 1987/88, Addis Ababa

4.4.5 The Spatial Pattern of Kebele Bread Shops

There are 299 government owned and public bread shops in Addis Ababa. The writer's analyses of their spatial pattern is restricted to the 284 Kebele shops since the bread sold under the new policy involves only these shops. Their locations is shown on Fig 1. which provided the point-pattern and distance data used in the analysis (below).

According to Christaller's central-place theory, a well organized market system which provides the consumer with optimal access to the service centre tends to form a uniform (regular) point- pattern in

space (Garner, B.J., 1978,307). Several empirical studies, however, have detected point patterns which tend towards randomness (eg. L.J.King 1962, 1-7, M.Dacey 1963, 55-57; L.Curry 1964, 130-146; RHT Smith, 1971,337; and Sporrek, 1985, 130). Sporrek, for example in his study of relating in Dar-es Salaam (although he did not use nearest neighbour analysis) argued that the expected pattern of food outlets was dispersed with a tendency towards clustering he noted that " Where the pattern of distribution of the market is of a dispersed nature, it can be said that the great majority of the people in the low and middle income areas had easy access to the supply points." (Sporrek, 1985, 130-131).

Other studies have supported the classical Christaller model, notably RHT Smith's nearest-neighbour analysis of periodic markets in W.Nigeria (RHT Smith, 1971, 339) and Getis study of grocery shop locations in Tacoma, USA (Getis, 1963, 14-22). The researcher has, therefore used nearest neighbour analysis to determine whether Kebele bread shops have the uniform/ regular spatial pattern which geographic theory (Christaller 1966) suggests provides consumers with optimal access to service providing points.

The results of the nearest neighbour analysis of Kebele shop locations are summarized in Table 24 and in

Appendix VIII. Analysis at the city-wide scale resulted in a nearest neighbour index of Rn = 0.74, which indicates a pattern which is more clustered than random. At the Ketena - scale the Rn values for Ketenas 1, 3 and 4 were also more clustered than random, while in Ketenas 2 and 5 the pattern of Kebele shops appears to be random (Table 24).

Table 24
Nearest Neighbour Index and Z-Score values For Kebele, Ketena level, 1987/88, Addis Ababa.

Ketena	No.of Bread Shops	Nearest Neighbour Index	Z-Score Values i.e	Spatial Pattern
Addis Total	284	0.742	-8.336 #	More Clustered Than Random
1	54	0.685	-4.433 #	" "
2	60	0.910	-1.336 *	Random
3	59	0.743	-3.774 #	More Clustered Than Random
4	54	0.857	-2.010 ~	" "
5	57	0.978	-0.315 *	Random

Source: Field Work, 1987/88, Addis Ababa,
The Master Map. Fig.1, 1967/88

Note: * Insignificant
~ Significant at 95% level
# Significant at 99% level.

Appendix VIII records the results of the nearest neighbour analysis at the Kefetegna level. The values of Rn ranged from 0.43 (clustered) in Kefetegna 25, to 1.68 in Kefetegna 7, which is approaching the expected uniform distribution. Most of the Kefetegnas (14) had

Rn values between 0.87 and 1.29, indicating a random spatial distribution. Only 7 Kefetegnas had Rn values between 1.30 and 1.72, indicating a more uniform than random spatial distribution. In 6 of these, the Rn values were statistically significant, i.e. Kefetegnas, 2,5,7,9,13 and 14. (In Kefetegnas 22 the value of Rn was not significant at the 95 or 99 percent levels, using the modified Z-test, recommended by Hammond and McCullagh, 1985, 275). Thus the results of the nearest neighbour analysis tend to reject the research hypothesis. The spatial pattern of Kebele shops do not have the optimal uniform pattern. In most Kefetegnas the pattern is random and in Kefetegnas 25 and 11 it is clustered and More clustered than random (the Rn values for Kefetegnas 12 and 17 were not significant at the 95 or 99 percent level). The 7 Kefetegnas where the pattern of Kebele shops is more uniform than random (i.e. more favourable for consumer access) are located in Kefetegnas 7 (Rn 1.68), 13 (Rn 1.59), 9 (Rn 1.54), 2 (Rn 1.45), 14 (Rn 1.37), 22 (Rn 1. 36) and 5 (Rn 1.36). The Kebeles within these Kefetegnas are the densely populated areas in the city, ranging from 15,001 to over 40,000 people per square kilometre (Fig.11). These Kebeles are again supplied predominantly by private bakeries which are located at short distances from the Kebele shops.

4.5 THE SPATIAL STRUCTURE OF THE NEW BREAD DISTRIBUTION SYSTEM

It is hypothesised by the researcher that the bakeries in Addis Ababa are favourably located relative to the consumers. Mean-field analysis was used to test this hypothesis. This method of studying the spatial structure of a market zone is recommended for market area studies in state controlled commercial systems by the Soviet economic geographer A.A. Tatarinov. (Tatarinov (1975) used this technique in a case study of the fuel oil market zones of Soviet refineries. The application of the methodology, however, need not be confined to any particular commodity. It can be used to describe statistically the spatial pattern of consumption of selected products within any market zone (Refer to Chapter II for details).

Analysis of the spatial structure of any distribution system usually distinguishes two main elements: the producing centre (in this case bakeries) and it's tributary area (in this case the Kebele bread shops) and the transport net linking the bakeries to the shops. The tributary area of any commodity producing centre is termed the "Aggregate Consumption Space" (Tatarinov, 1975,401). The writer has attempted to analyze these elements, in the Addis Ababa context using the mean-field concept. The first step was to construct a map of Addis Ababa, marking the location of all the bakeries; Kebele shops and the transport network that

joins the two. The next step was to find out the production of bread for each bakery (in kg) and the distances (in km) between the bakeries and Kebele shops. The results were then aggregated to Kefetegna level to calculate the values of d^1 and $\mathcal{M}$ (Table 25). These values allowed the writer to compare the density of the aggregate consumption space of the Kefetegna market zones.

The d^1 and $\mathcal{M}$ values at Ketana, Kefetegna and Addis Ababa levels are shown in Appendix IX. The interpretation of d^1 values is relatively straight forward if it is remembered that d^1 represents a) the radius of an idealized bread market zone, b) the magnitude that describes the size of the market zones (measured in kg/km) and c) the weighted length of haul for the bread market zones. The index describing the distribution of bread within each bread market zone however, is the value of $\mathcal{M}$. This is a magnitude, relating

Table 25
$\mathcal{M}$ - Index and Weighted Length of Haul (d^1) for Addis Ababa Bread Market Zones in 1987/88

Locations	Volume of Bread in a Day/Kg	Aggregated Transportation Cost in Km/Kg	Weighted Length of Haul (d^1)	Index Values ($\mathcal{M}$)
Addis Ababa Total	121,051	164,631.189	1.360015	89,008.088
Ketana 1	27,100	26,301.375	0.9705	27,923.75
Ketana 2	24,625	39,286.75	1.5954	15,435.00
Ketana 3	22,587.5	37,542.814	1.6621	13,589.735
Ketana 4	21,938.5	29,470.75	1.3433	16,331.79
Ketana 5	24,800	32,029.5	1.2915	19,202.477

Source: Field Survey, Addis Ababa, 1987.

the total amount of bread to the aggregate conditions of consumption within the bread zone (A.A Tatarinov, 1975,403).

The highest values of d', indicating districts with less favourable bakery and shop locations, relative to consumer are Kefetegnas 8, 16, 12, 17, 23, 20 and 15. The other Kefetegnas have d' values less than 1.7 and as the value decreases, the bread supply conditions tend to improve. The value of d' for Addis Ababa as a whole (i.e. the city average) was 1.36, which is almost half the d' value for Kefetegna 8 (2.46), which is the Kefetegna with the lest favourable bread supply conditions. The lowest d' values, indicating the most favourable bread supply conditions were found in Kefetegnas 9,5,6,7,1 and 14 in that order (See Appendix IX).

The calculated value of μ describes the aggregate conditions of consumption in a bread market zone. It can be used to compare the density of the aggregate consumption space of different zones. The greater the density, the more optimally is the producing centre located relative to consumers . The highest values of μ refer to the districts with optimal supply location. (Tatarinov, 1975, 403). These were Kefetegnas 5,7,6,9 and 4 (See Appendix IX). These districts contained 28, 11, 8 and 7 bakeries respectively.

The districts with the lowest values of μ have the least favourable bread consumption conditions. These were Kefetegnas 22, 12, 16, 8 and 17 in that order (These Kefetegnas also had high values of d'). These districts contained 2, 2, 4, 9 and 5 bakeries respectively.

The results of the application of Tatarinov's mean-field model to the Addis Ababa Kebele bread market indicates that Kefetegnas 9,5,6,7,1 and 14. are relatively well served. This analysis tends to confirm the results of the nearest neighbour analysis of bakeries, which indicated that Kefetegnas 6,9 and 14 had bakery distributions which were approaching the optimal uniform pattern (See Chapter 3, section 3). The results also support the nearest-neighbour analysis of Kebele shop locations (Section 4.3, above), which showed that Kefetegnas 2, 5, 7, 9, 13 and 14 were also relatively well served. (i.e the pattern of shops in these districts also approaches the optimal uniform pattern).

The Tatarinov model indicates that Kefetegnas with the least favourable bread supply situation were Kefetegnas 8, 16, 12, 17, 23, 20 and 15. By contrast the nearest neighbour analysis of bakery locations indicated that Kefetegnas 12,11,19,17,24,25,3, 21 and 23 deviated most from the optimal uniform pattern, while the Kefetegnas where the Kebele shop location deviated most from the optimal uniform pattern were Kefetegnas 24, 25, 20, 23, 16, 17, 19 11, 12, 1, 10, 8, 21, 6 and 3.

C H A P T E R V

TEMPORAL, INCOME AND SPATIAL VARIATIONS IN BREAD CONSUMPTION

5.1 BREAD CONSUMPTION TRENDS (1971-88)

5.1.1 Aggregate Bread Consumption

In 1971, the per capita consumption of bread in Addis Ababa was 23.7 kg. per year or 0.07 kg/day. Since 1971 per capita consumption has grown by 21.3 kg, the highest consumption being in 1987/88 (pcc 45 kg) (Table 2 and Fig.3). Between 1971/72 and 1982/83, the growth in per capita consumption was slow, but there was a sharp growth in 1983,84 attributable to flour shortages (Fig.3). Since the beginning of the new bread distribution policy (1984/85) the growth in the aper capita bread consumption has fluctuated (Fig. 3 and Table 2).

5.1.2 Consumption of Bread Supplied to Kebeles Under Government Quota System, 1984/85 -1987/88

The consumption estimates in Table 2 and Fig. 3 are based on estimates of bread production total and city population. However, if attention is restricted to the bread produced to supply the city's Kebeles, per capita consumption is

estimated to be 26.2 kg, (1984/85) 28.8 kg (1985/86), 27.6 kg, (1986/87), 30.2 kg. (1987/88) and 27.6 kg (988/89) (Ministry of Domestic Trade, 1987/88). The growth in quota bread consumption in the 4 years 1984/85 - 1987/88 was 14.4 percent, the share of quota bread in aggregate city-wide consumption averaged 67.4 percent (Table 2 and Appendix II). This is because the Ministry of Domestic Trade does not include all the bread produced in the city, in its bread quota allocation system. The production of the private brick-oven and government bakeries, for example, is not included in the quota allocation system.

5.1.3 Consumer Attitudes and Bread Consumption, 1987/88

In an attempt to determine the attitude of consumers to the bread sold through the Kebeles and in order to determine the role of bread in city-dwellers diets, the writer has analyzed the results of the questionnaire which was distributed to 440 households. The survey indicates that most consumers (35%) use bread as an addition to their normal diet; 31.2 percent considered bread as a substitute for other staple foods and the remaining 33.2 percent considered bread as both an additional food and as a substitute for

traditional staples. Of the 440 households interviewed, 26 percent regarded bread as a luxury food while 67 percent considered it as a food to be used only when there were cereal shortages in the Kebele shops and in the free market. During such periods cereal prices rise and the fixed prize of bread seems to attract additional consumers, especially in the low-income groups, a point confirmed the 68 percent of the Kebeles officials interviewed by the researcher.

The survey also suggests that the bread eating habits of the people of Addis Ababa have changed since 1984/85. Fifty three percent were of the opinion that their bread consumption had increased since 1984/85 and 60 percent expected that it would increase in the future.

The most favoured staple before 1984/85 was Enjera* (86%) compared to bread (8%). The interviewees responses, however, indicate a modest

* Enjera is a leavened fermented sour pancake, flat and round Ethiopian bread made from teff (Eragrostis Abyssinica), barley, wheat, maize, millet or from a combination of two or more of them. It is said that Sorghum is second to teff as a preferred cereal for Enjera and the best quality sorghum Enjera is made from the dehulled grain (UNECA, 1985, 87). The Ethiopian Nutrition Institute, Experiment result showed that the keeping qualities and softness of Enjera are improved by using composite flour consisting of 50% teff and 50% sorghum or maize (Ibid).

increase by 1988 in the number of people who favour bread as their staple food (18%), compared to Enjera (81%). There were however, income variations in the attitudes to Enjera and bread. Of the 81 percent who regarded Enjera as their favoured staple, 35 percent had incomes <300 birr; 34 percent had between 301 and 600 birr; and 31 percent had >600 birr per month. In the case of the 18 percent who favoured bread as their staple food, 30 percent earned <300 birr; 34 percent between 301 and 600 ; and 36 percent >600 birr per month. This figure suggest that the high income groups seem to favour bread more than the low income groups. Two major reasons were given for the increasing use of bread as a staple food. Fifty five percent attributed it to a general tendency in the city to eat more bread, while 44 percent identified population growth as the main cause of increasing bread use.

5.2 TEMPORAL VARIATIONS IN BREAD CONSUMPTION

Temporal variations in bread consumption, both diurnal and seasonal have been observed in Addis Ababa by the researcher during the course of the study.

5.2.1 Diurnal Variations in Bread Consumption

The results of the author's field survey indicated that bread has become an important staple food for breakfast, but not for dinner and lunch. Enjera with Wat is still the most important staple food for lunch and dinner. Table 26 also shows that Enjera, in the form of Firfir and Enjera bewat, is still important for breakfast (27.3%).

Table 26
Diurnal Variations In Bread Consumption, 1988

	Breakfast		Lunch		Dinner	
	No.	%	No.	%	No	%
Enjera Firfir	32	7.3				
Enjera Bewat	86	20				
Kita	5	1.1				
Kocho	2	0.5				
Bakery Bread	233	53	58	13.2	66	15
Difo Dabo	39	8.9				
Ambasha	38	8.3				
Others	5	1.1	382	86.8	375	85
Total	440	100	440	100	440	100

Source: Field Survey, Questionnaire I, 1987/88, Addis Ababa.

A further breakdown of the survey data in Table 22 according to income groups indicates that out of the 233 households that eat bakery bread for breakfast, 106 (45.5%) were in the 301 to 600 birr/month income group,

69 (29.6%) in the <300 birr income group; and 58 (24.9%) in the >600 birr income group. Of the 58 who eat bakery bread for lunch 23 (40%), 19 (32%) and 16 (28%) are in the <300, 301-600 and >600 birr per month income groups respectively. Of those who eat bakery bread for dinner, according to the sample survey, 22 (34%), 20 (31%) and 23 (35%) are in the <300, 301-600 and >600 birr per month income group in the order mentioned (Questionnaire I result, 1988). Bread consumption seems greater in the higher income group because it goes will with light food (eg. soup) favoured by upper income consumers confirmed by 72% response. The variations between income groups in timing of bread consumption are not very significant, except at breakfast. The higher consumption of bread for breakfast may be explained by the fact that bakery bread eating usually goes with tea drinking in our tradition.

5.2.2 Seasonal Variations in Bread Consumption

The writer also attempted to identify, using the views of Kebele officials and consumers, the seasonal variations in bread consumption in Addis Ababa. Sixty six percent of the 284 Kebele officials suggested that bread consumption fluctuates from year to year and from season to

season, depending largely on the availability of cereals in the Kebele shops. The officials suggested that generally, the cereal harvest season coincides with the major decline in bread sales. According to 75 percent of the Kebele respondents, the lowest bread sales usually occur during the period between the two small rainy seasons (bega season, November to late January), and during holidays and wedding periods. According to 85 percent of the 284 Kebele shop officials, the highest bread consumption takes place during the big rainy season (Sene to Meskerem June to September). Moderate bread consumption according to 55 percent of the officials is usually observed during the small rainy seasons, i.e. end of September until November and from March to early June (i.e. the Tibi and Belg seasons). Thus, the major months for bread consumption are Sene, Hamle, Nehase and Meskerm. While the minor months for consumption, are Hidar, Tahsas, and Tir.

The survey results differ in some respects from the seasonal pattern of bread sales which existed in the 1970's. Previously sales were at a peak during ceremonies and weddings, whereas

during the rest of the year they decreased (Agricultural, Industrial Development Bank, S.C., 1974, 13). It should be noted, however, that cereal prices tend to be at a peak during, the months of Sene to Meskerem (See Table 27). As a result the low income groups tend to increase their bread expenditures during the wet season. This point is also apparent in the

Table 27
Average Retail Prices of Certain Cereals in Addis Ababa, (1979,1980,1987,1988) by Season

Items	Unit	Price in Birr				Years
		Dry Season (Bega)	Autumn (Belg)	Summer Season (Kiremt)	Spring (Tibi)	
Teff-White Unmilled	1 kg	0.91	0.93	1.03	0.97	1979
Barley-White	1 kg	0.53	0.50	0.59	0.58	
Wheat-White	1 kg	0.82	1.06	1.23	1.22	
Teff-White Unmilled	1 kg	0.99	1.05	1.12	1.05	1980
Barley-white	1 kg	0.56	0.58	0.61	0.53	
Wheat-White	1 kg	0.95	1.1	1.2	1.1	
Teff-white Unmilled	1 kg	1.2	1.3	1.5	1.4	1987
Barley-white	1 kg	0.73	0.74	0.7	0.7	
Wheat-white	1 kg	0.96	1.02	1.02	1.4	
Teff white Unmilled	1 kg	1.33	1.3	1.53	1.4	1988
Barley-white	1 kg	0.72	0.7	0.74	0.7	
Wheat-white	1 kg	0.99	0.96	1.1	1.1	

Source: CSA, Addis Ababa, 1987/88.

CSO's 1979 survey (Table 28) and is confirmed by the writers field interviews in 1988.

The main reasons for the current seasonal pattern of bread consumption in the city seems to be connected with the availability of firewood and other staple foods. During the rainy season there are shortages of not only cereals but also of firewood. Thus it is not easy to prepare traditional staple foods at home at these times of the year.

The views of the Kebele officials were generally confirmed by the household survey. Of the 440 households surveyed, 313 (71%) confirmed that they eat more bakery bread during the big rainy season, mainly because of its low cost and because tea consumption is relatively favoured during this season. When disaggregated into income groups, most of the people who eat more bread during the big rainy season were in the lowest income group: 145 (46.3%) were in the <300 birr monthly income group, 93 (28.8%) were in the 301 to 600 birr group; and 78 (24.9%) were in the >600 birr/month income group. The survey results thus suggest that the lower income groups tend to rely on bakery bread during the wet season. By contrast, according to 69 percent of the households, during holidays, their bakery bread purchases decline because they prefer to bake traditional Difo Dabo at home.

Bakery owners and the operators of public and government bakeries, also expressed thus views concerning the amplitude of the seasonal movement of bread sales. Like

the Kebele officials and consumers they were also of the opinion that the seasonal pattern of bread consumption in Addis Ababa was influenced by the price of bread relative to other staple foods, especially during the rainy season. The price of bread is the same throughout the year, but cereal prices are higher in the rainy season. The bakery owners also stated that although bread consumption is high, production is relatively low during the rainy season, because firewood shortages have negative effect on bread production. Two hundred and forty cubic meters of firewood are used daily by brick-oven and modern bakeries in the city (Questionnaire II, 1987/88). The bakery owners also noted that the average price of a cubic meter of firewood was Birr 80 in the open market during the time when the survey was conducted. As a result, six of the brick-oven bakeries ceased bread production during the big rainy season of 1988, resulting in bread supply shortages. These bakeries were assigned to supply bread to 42 tea houses not very far from their respective locations.

5.3 INCOME AND BREAD CONSUMPTION

5.3.1 Expenditure On Food In General

According to Engel's law " the larger a family's income the smaller the fraction spent upon food" (Stigler, G.J., 1966,38). Previous income and expenditure surveys in Addis Ababa during the late

1960's, 1970's and early 1980's by the CSO indicated that consumer behaviour in the city conformed to

Table 28
Addis Ababa Raining Season Food Expenditure Estimates by Income Group, 1975 (Percent

Salary Group in birr	Total Food	Bread
20 - 79	49.8 - 52.9	0.6 - 1.9
80 - 499	36 - 50.4	0.7 - 1.5
500 - 999	24.5 - 38	0.4 - 1.5
> 1000	14.4 - 35.1	0 - 2.8
All Households	32.9	1.0

Source: CSO, Report on the Addis Ababa Household Expenditure Survey, No.19, February 1979, A.A. PP 36-41.

Engel's Law. The researcher has therefore, analyzed his consumers survey results to determine whether the pattern of food consumption in general and of bread consumption in particular differs from previous findings.

For example, the CSO surveys of 1963 and 1975 showed that the <500 Birr group spent 24-53 percent of their income on food with the higher income groups spending progressively less on food (CSO, 1979,36-41). A similar situation existed according to the 1979 and 1980 surveys (See Table 29 and 29). The writer's survey indicates that in 1988 Engel's Law was still relevant in Addis Ababa. Of the 400 households almost 64 percent earned <300 birr/month and they spent an estimated 64 percent of their incomes on food. By contrast the 14 percent of households, with incomes >600 Birr/month

spent <39 percent of their income on food (Table 30). The writers findings thus go in line with previous surveys by the CSO.

Table 29
Addis Ababa Estimated Domestic Food Expenditures, July 1979 and February 1980 (in percent)

Salary Group In Birr	July 1979 (Rainy Season)	February 1980 (Dry Season)
<99	50.25 - 54.28	53.34 - 54.25
100 - 499	39.59 - 51.90	40.37 - 45.90
500 - 999	21.92 - 44.32	26.19 - 42.46
>1000	21.20 - 40.80	20.01 - 21.31
All Households	42.10	39.56

Source: CSO, Report On The Household Energy Consumption Survey OF Addis Ababa, No.40, July 1984, PP. 25-29, PP.173 - 183.

5.3.2 Expenditures on Bread

The CSO's 1975 survey indicates that the upper income group spent considerably more on bread.

Table 30
Estimated Food and Bread Expenditure by Income Group 1988 For 440 households in A.A

Sample Households			Income in birr/month	Expenditure On Food in %	Expenditure On Bread in %
No.	%	Average Household Size			
280	63.6	7.3	< 300	63.9	6.3
98	22.3	6.1	301-600	43.8	6.0
62	14.1	5.0	> 600	38.7	6.7
400	100	6.13			

Source: Field Survey, Questionnaire I, 1987/88, Addis Ababa.

The lower income groups tended to spend more on bread, than the middle income groups especially during the rainy season (See Table 28). The writer's 1988 survey suggests that a change may have occurred in bread spending behaviour since 1975 (See Table 30). Bread is still a small proportion of total food expenditure, but it now stands at almost 7 percent, whereas it was less than 3 percent of consumption expenditures in 1975. It also appears that the bread expenditure by the low income groups have increased considerably and are now almost the same as the upper income groups (Tables 28 and 30). This conclusion was tested using the Chi-Square test, which confirmed that (according to the 1988 data) there is statistically no significant difference between the bread expenditure of the lower, middle and upper income groups (Table 31).

Table 31
Differences Between the Bread Expenditures
of Three Income Groups

Income groups in Birr/Month	Expenditure on Bread In Percent
<300 301 to 600 >600	6.3 6.0 6.7
Total	19
Chi-square (calculated) = 0.042 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level	

Source: Field Survey, Questionnaire II, Addis Ababa 1987/88.

It should be noted at this point that one of the major objectives of the new bread quota policy, when it was introduced in 1985 was to supply the low income groups with cheap subsidized bread from shops close to their homes. If that was so, how fair has the new policy been to the people in the low income bracket? Does it mean that Kebeles with proportionally more low income dwellers are allocated more bread? To answer this question the writer used rank order correlation to analyse the relationship between bread quotas and the proportion of low income dwellers in each Kebele. The writer's hypothesis was that Kebeles with higher proportions (percent) of low income people in their population would receive bigger bread quotas. The results of the analysis at the Ketena and Kefetegna levels, indicates a very weak correlation (Rs = -0.003) between quota size and the size of the low income population in a Kefetegna (See Table 32). The poor in the city are not favoured through the quota policy, which is based solely on population size. The writer's research suggests that increasing bread consumption by the poor is thus due mainly to low prices offered by the Kebele shops, rather than favourable quota allocations.

5.4 SPATIAL PATTERNS OF BREAD CONSUMPTION

The writer expected that the amount of bread assigned to a Kebele would be proportional to its population size (Hypothesis 6). As the population size varies from Kebele to

Table 32
Result of Rank-order Correlations For Low-Income Population Ratio and Per Capita Consumption Of Bread Kefetegna Level, 1985/86*

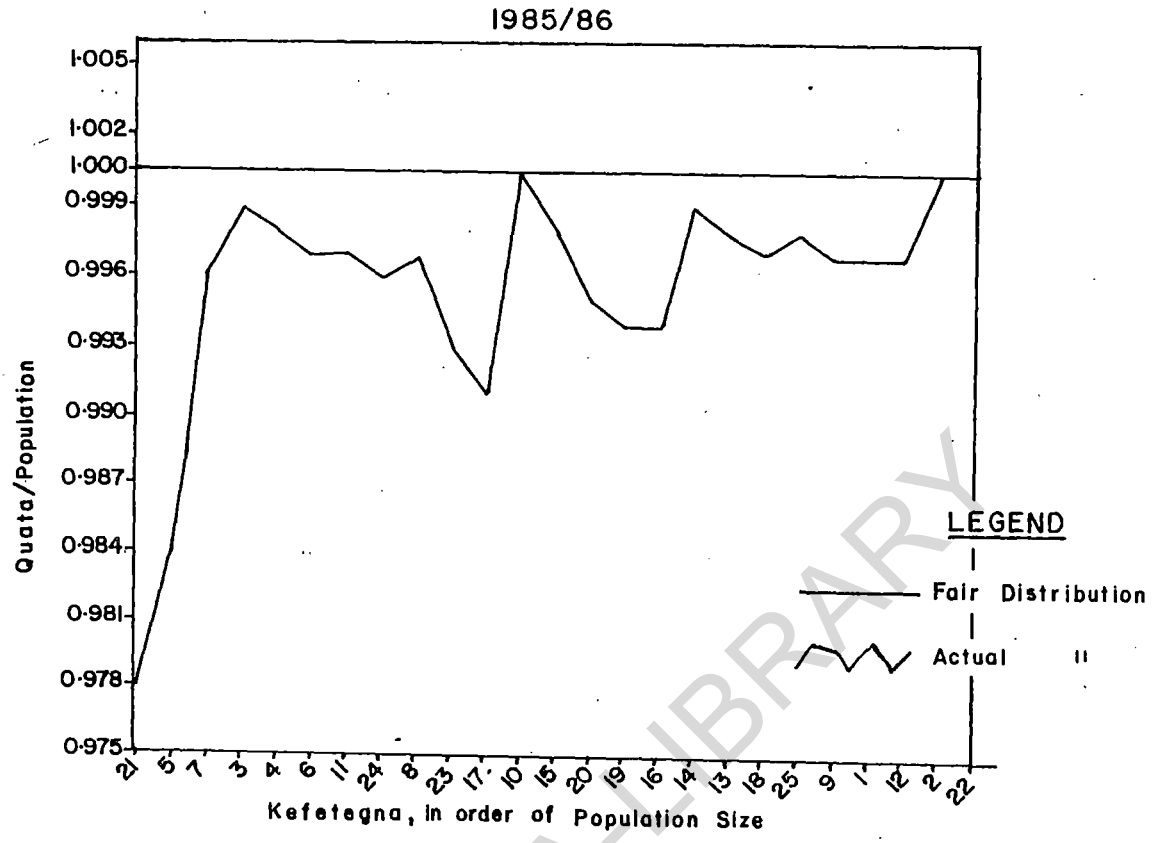
Ketana	Keftegna	Low Income Population Ratio (X)		Per Capita Consumption Of Bread In Kg. 1 Year (X)		Difference in Ranks (d^2)	Rank Order Correlation (Rs)
		%	Rank	X	Rank		
	4	52	3	29	12.3	90.25	0.11
	5	41	8	28	19	121.00	0.07
1	6	49	4	27	24	400.00	0.31
	24	12	24	28	19	25.00	0.16
	25	28	17	29	12.5	20.25	0.33
Ketana Total		36.4		28.2			0.10
	3	48	5.5	29	12.5	49.00	0.43
	20	28	17	35	2	225.00	0.14
2	21	35	11.5	30	8	12.25	0.46
	22	35	11.5	27	24	156.25	0.30
	23	14	23	38	1	484.00	0.16
Ketana Total		32.0		31.8			0.78
	15	39	9	31	5.5	12.25	0.42
	16	26	19.5	29	12.5	49.00	0.27
3	17	9	25	28	19	36.00	0.21
	18	30	15	28	19	16.00	0.50
	19	24	21	29	12.5	72.25	0.35
Ketana Total		25.6		29			0.55
	2	33	13.5	33	3	110.25	0.01
	11	33	13.5	29	12.5	1	0.16
4	12	18	22.0	27	24	4	0.08
	13	36	10	28	19	81	0.47
	14	53	2	32	4	4	0.09
Ketana Total		34.6		29.8			0.43
	1	47	7	28	19	144	0.60
	7	48	5.5	28	19	182.25	0.04
5	8	26	19.5	30	8	132.25	0.14
	9	55	1	30	8	49	0.10
	10	28	17	31	5.5	132.25	0.37
Ketana Total		40.8		29.4			0.20
Total 25		33.9				2608.5=Rs	0.00326923.01

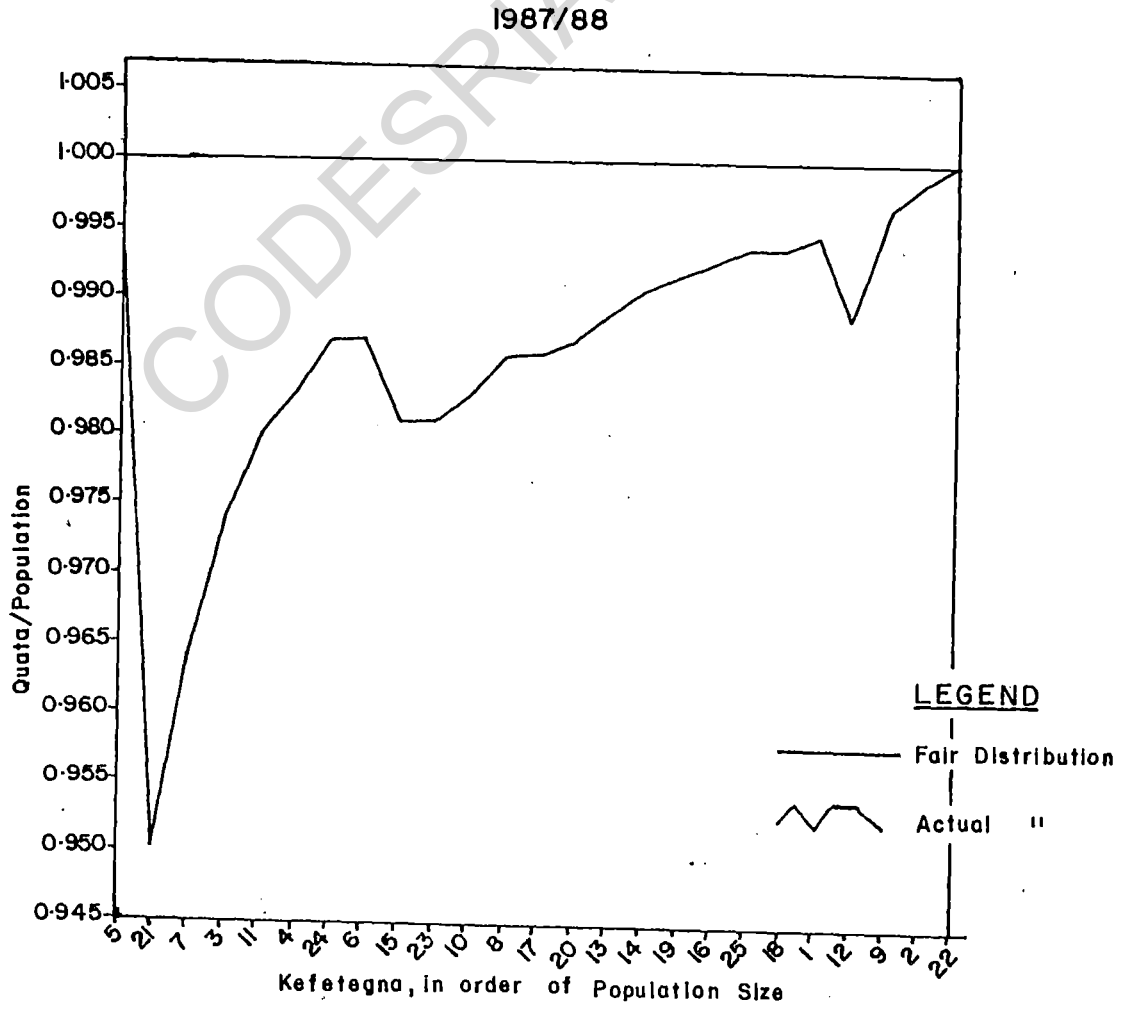
Source: 1. Ministry of Domestic Trade, A.A. 1985/86
2. Addis Ababa Municipality Office 1985/86.

Fig. 19

Bread Quatas vs Population, Kefetegna Level

(1985/86 & 1987/88)





Kebele, so the quota size was also expected to vary. To test this hypothesis the writer calculated of the coefficient of geographic association (cg) between population size and the corresponding bread quota at the Kebele Kefetegna, Ketena and city levels (See Appendix X and XI). The analysis was performed using the bread quota allocations for 2 years (1985/86 and 1987/88) to see if there were any differences between the two years quotas.

The coefficient of association between population and bread quota kg/day at the Kefetegna level in 1985/86 was 0.0036 (Appendix VIII, part 2) and 0.00015 for 1987/88 these coefficients are very low on the 0 to 1 range, indicating that the association between the two mentioned variables is very high. Moreover, the data suggest that the quota in

1987/88 is closer to population than before. The Gini concentration ratios for the years 1985/86 and 1987/88 were also calculated for 25 Kefetegnas (See Appendix XIII part 1 and 2). The Gini coefficients were 0.033 (1985/88) and 0.011 (1987/88), which also suggests an improvement since 1985/86. The writer's analysis thus suggests that the quota policy is fair, in that it accounts for population size. The more the number of people a Kebele has the more amount of bread is assigned to it.

Although the size of the bread quotas coincides closely with population size, the correspondence is not exact. Fig.19 also shows that most Kefetegnas received less bread than suggested by their population, size, although Kefetegnas 10, 2 (1985/86 and 22 in 1987/88 received more bread than suggested by their population size.

The small size of the bread quota in relation to Kebele population size was also raised by the Kebele officials during the field survey. Eighty five percent desired more bread than was allocated to them to compensate for growing population. Without such increases, shortages occur in the Kebeles, a point noted by most of the households interviewed. Almost 85 percent complained that bread supplies did not last throughout the day and 68 percent indicated that the quantity marked in their cards was not enough to meet their needs.

CHAPTER VI

PRODUCER, RETAILER AND CONSUMER ATTITUDES TO THE BREAD MARKETING SYSTEM

As was pointed out in Chapter 1, one of the main objectives of the new bread marketing system was to benefit consumers, especially those in the low income bracket. Bread is thus sold in rationed quantities at low, subsidized prices through a wide network of Kebele shops. Raw materials and other inputs though scarce in amount, are also made available to bakery operators at low subsidized prices.

These are the objectives and the mechanisms which are used to achieve the goals of the policy-makers. It remains, therefore, to examine the attitudes of the baker's, retailers and consumers towards the new system. To do this the writer has analysed and summarized the results of the three questionnaires.

6.1 General Attitudes to the New Policy

The consumer survey results indicate that most consumers (89%) have positive attitudes regarding the new bread marketing system. There were, however, some variations depending on the types of bakery which supplied the consumer. Those consumers living in Kebeles which obtained their bread from private bakeries were more negative towards the new policy (Table 33). More significant were the variations of different income groups to the new policy.

Table 33
Consumers General Opinion Of The
New Bread Distribution Policy

	Type of Supplying Bakery	Number With Positive Attitudes		Number With Negative Attitudes		Total Consumers	
		No.	(%)	No.	(%)	No.	(%)
1	Kebele Bakeries	46	(92)	4	(8)	50	(100)
2	Municipality Bakeries	139	(93)	11	(7)	150	(100)
3	Modern Private Bakeries	205	(85)	35	(15)	240	(100)
	Total	390	(89)	50	(11)	440	(100)

Chi- Square (Calculated value) = 5.45
Chi- Square (Critical values) = 5.99
H_o accepted, Chi- Square Significant at 0.05 level

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

Consumers in the upper-income bracket differed significantly from the other income groups. Only 53 percent in the upper income group, compared to 84 percent in the middle income and 98 percent of those in the low-income group favoured the new policy . The results of the Chi-square test indicates that these differences are statistically significant (Table 34).

Table 34
Consumers General Opinion of the
New Bread Distribution Policy

Income Groups (Birr/Month)	Number of Positives		Number of Negatives		Total Responses	
	No.	(%)	No.	(%)	No.	(%)
1. <300 [low-Income Group]	275	(98)	5	(2)	280	(100)
2. 301-600 [Middle-Income Group]	82	(84)	16	(16)	98	(100)
3. >600 [upper-Income Group]	33	(53)	29	(47)	62	(100)
Total	390	(89)	50	(11)	440	(100)

Chi-square (calculated value) = 105.1
Chi-square (critical value) = 5.99
H° accepted, Chi-square significant at 0.05 level

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

6.2 ATTITUDES RELATING TO BREAD PRODUCTION

6.2.1 Poor Quality Of Bread Sold in Kebeles

The consumer survey indicates that two thirds of the consumers had a negative view of the quality of bread sold in their Kebele shops. The most discontented customers were those living in Kebeles supplied by private bakeries; the most satisfied (relatively) were those living in

Table 35
Consumers Attitudes to Bread Quality

Type of Supplying Bakery	Number with Positive Responses		Number with Negative Responses		Total Responses	
	No.	(%)	No.	(%)	No.	(%)
1. Kebele Bakeries	22	(44)	28	(56)	50	(100)
2. Municipality Bakeries	61	(34)	89	(66)	150	(100)
3. Modern Private Bakeries	64	(27)	176	(73)	240	(100)
Total	147	(33)	293	(67)	440	(100)
Chi-square (calculated value) = 10.98 Chi-square (critical value) = 5.99 H_o accepted, Chi-square significant at 0.05 level						

Sources: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

Kebeles supplied from Kebele - owned bakeries. The results of the Chi-square test indicates that these attitude differences were statistically significant (Table 35).

Consumer attitudes to bread quality differed less according to income. All income groups had a negative attitude (average 67%),although the upper income group had relatively more negative attitudes (77%) (See Table 36).

Table 36
Consumers Attitudes to Bread Quality

Consumer Income Category (Birr/Month	Quality Attitudes Towards the Supplied Bread					
	Number of Positive Responses		Number of Negative Responses		Total Responses	
	No.	%	No.	%	No.	%
< 300 =	103	(37)	177	(63)	280	(100)
301-600 =	30	(31)	68	(69)	98	(100)
> 600 =	14	(23)	48	(77)	62	(100)
Total =	147	(33)	293	(67)	440	(100)

Chi- Square (calculated value) = 5.05
Chi- Square (critical value) = 5.99
H_o accepted, Chi-square significant at 0 .05 level

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

The general impression that the Kebeles sell low quality bread is also reflected in the view of 52 percent of the 440 households, who indicated that the quality of bread sold by free market-outlets was higher than that sold by the Kebeles.

The Kebele officials interviewed by the researcher share the negative view of the consumers. Eighty Seven percent indicated that the quality of bread sold in their shops was not satisfactory. Moreover, there were differences in their attitudes depending on the type of bakery which supplied them with bread. The Kebele officials were most negative when supplied by private bakeries (98%) and least

Table 37
Kebele Officials Attitudes to Bread Quality

Type of Supplying Bakery	Attitudes to Bread Quality					
	Number of Positive Attitudes		Number of Negative Attitudes		Total Responses	
	No.	(%)	No.	(%)	No.	(%)
1. Kebele and Church bakeries=	24	(48)	26	(52)	50	(100)
2. Municipality Bakeries =	9	(15)	51	(85)	60	(100)
3. Modern Private Bakeries =	3	(2)	171	(98)	174	(100)
Total =	36	(8)	248	(92)	284	(100)
Chi-square (calculated) = 75.51 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire III, Addis Ababa, 1987/88

negative (52%) when supplied by Kebele owned bakeries. These results were shown to be statistically significant using the CHi-square test (Table 37). Consumers and Kebeles officials are both relatively negative about the quality of bread obtained from private bakeries.

6.2.2 Stale Bread

Confirmation of the negative attitude to bread quality were the frequent references by consumers and bakers to stale bread. The bread produced for distribution in the Kebeles has a shelf-life of less

Table 38
Consumers Attitudes to Stale Bread

Type of Supplying Bakery	Number of Consumers With Negative Attitudes		Total Consumers	
	No.	(%)	No.	(%)
1. Kebele bakeries	1	(2)	50	(100)
2. Municipality bakeries	142	(93)	150	(100)
3. Private bakeries	237	(99)	240	(100)
Total	380	(86)	440	(100)
Chi-square (calculated) = 342.23 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level				

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

than a day before its taste and edibility deteriorate.

Eighty six percent of the consumers complained about stale bread although there were major differences, depending on the source of the bread. Almost all the consumers supplied by private bakeries complained of staleness (99%), whereas only 2 percent of those supplied by Kebele bakeries complained of staleness. (These attitudes differences are statistically significant, according to the Chi-square test. See table 38). These findings suggest that Kebele bakeries enjoy certain advantages, possibly associated with short transport routes to the Kebele shops, and with better supplies of inputs which can improve freshness.

Table 39
Attitudes Of Consumers To Stale Bread
According to Income Groups

Income groups (Birr/month)	Number with Negative Attitudes		Total Consumers	
	No.	(%)	No.	(%)
< 300	230	(82)	280	(100)
301 - 600	89	(91)	98	(100)
> 600	61	(99)	62	(100)
Total	380	(86)	440	(100)
Chi- square (calculated) = 13.5 Chi- square (critical) = 5.99 H_0 accepted, Chi-square significant at 0.05 level				

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

Most consumers complained about staleness (86%), although significantly more of the upper income consumers (99%) complained about this problem (Table 39). Likewise the majority of bakery operators (95%) were aware of the staleness problem. The highest awareness was found among the Kebele , Church and private bakery operators. However, only two-thirds of the municipality -owned bakeries mentioned this problem. (Table 40). As noted in Chapter 3 government and municipality bakeries operate at relatively high capacity and seem to be favoured with input supplies. As a result they may be able to produce bread which does not deteriorate rapidly.

Table 40
Attitudes of Bakery Operators to Stale Bread

Type of Bakery	Number with Negative Attitude		Total Bakeries	
	No.	(%)	No.	(%)
1. Kebele and Church owned =	48	(94)	51	(100)
2. Municipality owned =	2	(67)	3	(100)
3. Private owned =	128	(96)	134	(100)
Total =	178	(95)	188*	(100)
Chi-square (calculated) = 4.88 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level				

Source: Field Survey, Questionnaire III, Addis Ababa 1987/88.

* Five government bakeries are not included.

6.2.3 Composite Flour-Bread

Only 14 percent of the consumers interviewed preferred bread made of composite flour. Eighty six percent prefer bread made from pure wheat flour (Tables 41 and 43). There were no big differences between income groups. All prefer wheat-flour bread, although relatively more in the upper income group (95%) indicated a preference for wheat flour (Table 42).

6.2.4 Product Differentiation

All of the bread sold in Kebele shops under the new policy is of uniform size and price is unpackaged. As a result product differentiation in the Addis Ababa

Table 41
Preference For Wheat-Flour Bread

Type of Supplying Bakery	Number With Positive Attitudes		Number with Negative Response		Total Consumer	
	No.	(%)	No.	(%)	No.	(%)
1. Kebele bakeries	44	(88)	6	(12)	50	(100)
2. Municipality bakeries =	140	(93)	10	(7)	150	(100)
3. Private bakeries =	196	(82)	44	(18)	240	(100)
Total =	380	(86)	60	(14)	440	(100)
Chi-square (calculated) = 10.8 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

Table 42
Consumers Attitudes to Wheat-Flour Bread
According to Income Groups

Income Groups (Birr/month)	Number with Positive Attitudes		Number with Negative Attitudes		Total Consumers	
	No.	(%)	No.	(%)	No.	(%)
< 300	237	(85)	43	(15)	280	(100)
301-600	84	(86)	14	(16)	98	(100)
> 600	59	(95)	3	(5)	62	(100)
Total	380	(86)	60	(14)	440	(100)
Chi-square (calculated) = 4.82 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88

Table 43
Consumers Attitudes to Composite Flour

Flour Type	Number of Consumers Favouring	Percent
1. Bread with Wheat-Sorghum Flour	1	0.20
2. Bread with Wheat-Millet Flour	2	0.50
3. Bread with Wheat-Maize Flour	57	13.00
4. Bread With Wheat only	380	86.3
Total	440	100

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88

bread market is very limited. The writer's consumer survey indicates that only 36 percent of consumers were

Table 44
Consumers Attitudes to Product Differentiation

Type of Supplying Bakery	Number of Favouring Uniform Bread Quality		Number of Favouring Product Differentiation		Total Consumers	
	No.	(%)	No.	(%)	No.	(%)
1. Kebele bakeries	11	(22)	39	(78)	50	(100)
2. Municipality bakeries	62	(41)	88	(59)	150	(100)
3. Private bakeries	86	(36)	154	(64)	240	(100)
Total	159	(36)	281	(64)	440	(100)
Chi-square (calculated) = 6.1 Chi-square (critical) = 5.99 H_0 accepted Chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

satisfied with this situation. Sixty four percent indicated a desire for greater product variety, in terms of price, weight, packaging and quality (Table 44). There were, moreover, significant attitude variations between income groups, with 90 percent of the consumers in the upper income group indicating a desire for great product differentiation by bread makers (Table 45).

Table 45
Consumers Attitude to Limited Product Differentiation

Income Groups (Birr/month)	Number with Positive Attitudes		Number with Negative Attitudes		Total Consumers	
	No.	(%)	No.	(%)	No.	(%)
< 300	121	(43)	159	(57)	280	(100)
301-600	32	(33)	66	(67)	98	(100)
> 600	6	(10)	56	(90)	62	(100)
Total	159	(36)	281	(64)	440	(100)
Chi-square (calculated) = 21.1 Chi-square (critical) = 5.99 H_o accepted, Chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

6.2.5 Quality Control, Quality Improvements and Incentives

Under the new policy bread is sold at low fixed prices, which are set by the government. The bakery operators, therefore, have no price incentives to improve or even maintain high quality control standards. Moreover, the policy has separated the bakeries from the consumers. As a result some of the risks of bread production,

associated with negative consumer reactions, seem to have been transferred from the bakeries to the Kebeles. The bakeries cannot respond to consumer pressure and they do not need to. The policy provides them with a guaranteed market and it focuses on volume production. There is no organization to ensure quality control during bread production and/or transport within the Ministry of Domestic Trade. It does concern the Addis Ababa Regional office but the work load to deal with 201 bakeries' operations and 284 Kebele bread shops and their transportation network is beyond the manpower and financial capacities of this organization. According to 65 percent of the Kebele officials interviewed, quality control was not a policy priority. Adequate supplies at low prices were the government's main concern, especially during famine years. However, during years when cereal supplies are adequate (eg. 1988) consumers in Addis Ababa seem to desire higher quality bread. According to most, it is not available.

6.3 ATTITUDES RELATING TO BREAD TRANSPORT AND HANDLING

The writer's interviews with almost 200 bakery operators and over 400 consumers revealed that the majority were very critical of the way bread was handled by Kebele employees. The bakery operators argued that most of the

damage and spoiling of bread was the fault of Kebele employees who were careless during the de-panning, packing (in dirty sacks) and transport of bread. Table 48 shows that 95 percent of the bakery operators were critical of how Kebele employees handled bread, since this led to the delivery of bread which was crushed, broken and soiled.

Eighty-five percent of the interviewed consumers were also critical of how Kebele employees handled bread in the bread shops and during transport from the bakery (Table 47). They complained of broken and soiled bread which had been roughly handled and transported in dirty unhygienic sacks. (The researcher himself noted that many had been used as

Table 46
Attitudes of Consumers to Bread Handling by Kebeles' Employees

Type of Supplying Bakeries	Number with Positive Attitudes		Number with Negative Attitudes		Total Consumers	
	No.	(%)	No.	(%)	No.	(%)
1. Kebele bakeries	48	(96)	2	(4)	50	(100)
2. Municipality bakeries	11	(7)	139	(93)	150	(100)
3. Private bakeries	7	(3)	233	(97)	240	(100)
Total	66	(18)	374	(89)	440	(100)
Chi- square (calculated) = 291.7 Chi-square (critical) = 5.99 H_0 accepted chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire I, Addis Ababa, 1987/88.

Table 47
Attitudes of Consumers to Bread Handling by Kebele employees according to Income Group

Consumers Income Group (Birr/Month)	Number with Positive Attitudes		Number with Negative Attitudes		Total Responses	
	No.	(%)	No.	(%)	No.	(%)
< 300	56	(20)	224	(80)	280	(100)
301-600	8	(8)	90	(92)	98	(100)
> 600	2	(3)	60	(97)	62	(100)
Total	66	(15)	374	(85)	440	(100)
Chi-square (calculated) = 15.83 Chi-square (critical) = 5.99 H_o accepted, chi-square significant at 0.05 level						

Source: Field Survey, Questionnaire I, Addis Ababa 1987/88.

cereal or fertilizer sacks in the past). Table 48 also shows significant variations in consumer attitudes to the handling of bread by Kebele workers, depending on the type of supplying bakery. Most complaints were made about bread delivered from private (97%) and municipality bakeries (93%). There were relatively few complaints about negative bread handling by consumers who buy bread baked by their own Kebele bakery (4%) (See Table 46). Most consumers (85% complained about bread handling by Kebele employees. Most of the complainers were in the middle (92%) and upper income groups (97%). Only 80 percent of those in the lower income groups, voiced negative opinions about bread handling (Table 47).

As noted above, 65 percent of the interviewed Kebele officials noted that quality control was not a major priority. (By implication many were not concerned with insuring careful handling during the loading, transport and selling of bread). Most Kebele officials pointed to the role of Kebeles in selling bread at low fixed prices especially during famine periods. They also noted that Kebeles provided consumers with easy access (i.e. short trips from home) to bread shops. Ninety one percent of the 284 Kebeles officials interviewed by the researcher noted that a major benefit of the new policy was that it eliminated the need to queue for long periods outside bakeries.

Table 48
Attitudes of Bakery Operators towards Bread Handling by Kebele Employees

Type of Bakery	Number with Positive Attitude		Number with Negative Attitude		Total Consumers	
	No.	(%)	No.	(%)	No.	(%)
1. Kebele and Church Owned Bakeries	3	(6)	48	(94)	51	(100)
2. Municipality Owned Bakeries	1	(33)	2	(67)	3	(100)
3. Private Owned Bakeries	6	(5)	128	(95)	134	(100)
Total	10	(5)	178	(95)	188	(100)
Chi-square (calculated) = 4.88 Chi-square (critical) = 5.99 H_o accepted Chi-square significant at 0.05 level						

Source: Field survey, Questionnaire II, Addis Ababa, 1987/88

6.4 PRIVATE SECTOR SHOPS PREFERRED AS BREAD RETAIL OUTLETS

Table 49
Preferred Retail Outlets of Bakery Operators

Type of Retail Bread Outlets	Rank of Retail Outlet Choices				
	1	2	3	4	5
	Number of bakeries making choices = 193				
1. Direct Consumer Sales by bakery owned shop	100	93	--	--	--
2. Via Private Retailers	99	90	4	--	--
3. Via Super Markets	--	99	94	--	--
4. Via Kebele Shops	--	--	59	134	--
5. Via Street Hawkers	--	--	--	80	113

Source: Field Survey, Questionnaire II, Addis Ababa, 1987/88

The writer also interviewed 193 bakery operators regarding the types of retail outlet through which they preferred to sell their bread. The results are shown in Table 49. The least preferred outlets were street hawkers and Kebele shops. The majority of the city's bakers prefer to sell through private sector retail outlets, such as groceries (51 %), bakery-owned bread shops (52 %). Bread sales through government-owned supermarkets occupied a middle position.

A slight majority of the interviewed consumers also expressed a desire to see more bread sold through groceries

and bakery owned bread shops. Fifty two percent of the consumers felt that the bread available in private groceries was of higher quality than the bread sold through the Kebele shops. Fifty-one percent favoured the sale of bread by bakers, through their own shops, since they associated this with higher quality bread.

6.5 CONCLUSIONS

The attitude survey revealed the general satisfaction of the city's consumers with the general operation of the new bread policy. However most consumers, Kebele officials and bakery operators are critical of low bread quality. The survey revealed considerable income-level attitude variations. The low-income consumers seem to be generally more satisfied, while the upper income bracket consumers are clearly dissatisfied with the low uniform quality of bread sold in the Kebele shops. They strongly desire the availability of bread of different quality, sizes, prices and packaging. The survey indicated that Kebeles bread shop officials were generally satisfied with the policy, although they, like the consumers, were critical of the low quality of bread, especially that supplied by private bakers. The bakeries operated by Kebeles were subject to less criticism by both consumers and Kebele bread shop officials.

Table 50
Bakery Operators Rankings of Factors
Impeding Improvements In Bread Production

Problem Variables	Rank of Major Variables						Persons who Rank Variable in top 6.	
	1	2	3	4	5	6	No.	(%)
- Scarcity of raw materials	122	3	6	13	8	7	159	82.4
- Transportation Problem	32	9	37	22	15	30	145	75.12
- Kebele intervention	5	9	26	20	38	24	122	63.21
- Government intervention	4	18	13	35	30	22	122	63.21
- The New Bread Distribution Policy	--	28	14	29	18	29	118	61.14
- Marketing Problems	22	26	23	16	9	17	113	58.60
- Oldage of Bakery Equipment	12	9	24	14	24	19	102	52.9
- Low Retail Price	5	15	11	16	22	31	100	51.8
- Capital Shortages	4	18	12	13	18	13	78	40.4
- Enterpreneurial management weakness	2	15	15	14	12	13	71	36.79
- Skilled Manpower shortage	9	6	7	4	11	8	39	20.2
- Bad Labour Relations	3	6	7	5	7	6	34	17.6

Source: Field Survey, Questionnaire II, Addis Ababa, 1987/88

The bakery operators, the majority of whom are private bakery owners were critical of the policy in general and the supply of raw materials in particular . Most would prefer to sell their bread through private sector retail shops. (Tables 49 and 50).

C H A P T E R VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Since the early 1980's crop production in rural Ethiopia has stagnated and cereal prices in Addis Ababa have increased faster than the incomes of city dwellers. Consequently price inflation and food shortages have prevailed in the city, especially in 1984/85. The city population has responded by changing the composition of it's diet. Since 1982/83, bread consumption has increased and imported cereals (eg. rice) have grown in importance, as have processed foods (eg. pastas, flours from cereals, pulses).The increase in bread consumption has been accompanied by an increase in the number of bakeries and in bread production. The changing pattern of bread consumption and production has also been accompanied by a new bread marketing system, implemented since 1985 by the Ministry of Domestic Trade. The writer's research has focused on the economic geography of the major components of the new system i.e bread production, transport, retailing and consumption. The major findings are as follows:-

7.1 BREAD PRODUCTION SYSTEM

The input materials for bread making (i.e. flour, yeast, sugar, oil, salt, fuel) are in short supply. The current supply of bakery flour is far below the attainable

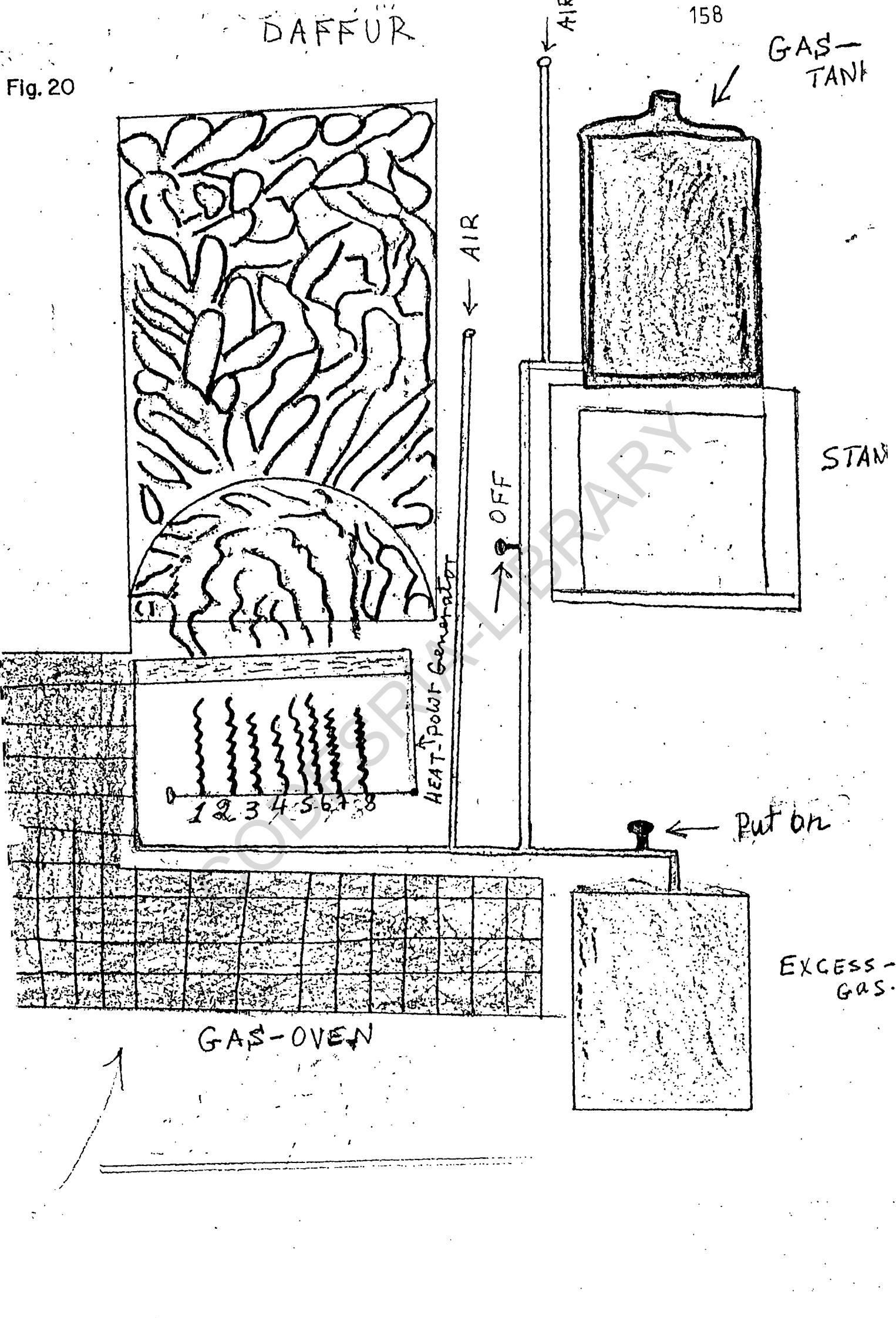
capacities of the bakeries in the city. An additional 138,150 kg/day of flour is required to allow the bakeries in Addis Ababa to operate a full capacity . At present there is unused capacity in the city bakeries, especially in the private sector, due mainly to raw material shortages. There are flour shortages mainly because enough wheat is not produced by peasants or the state farms nor imported from overseas. Hence, the present bread production problems in the city do not justify the establishment of additional bakeries, since the basic problem is the supply of raw materials. The attention of the policy makers should rather focus on the establishment of new flour mills in the city. Alternatively, the flour allocation policy should be changed so as to confine the flour production of the Addis Ababa mills to Addis Ababa bakeries only. In this way the flour supply could be increased to meet the existing demand for flour in the city. Almost all of the EFC's flour mills were established during the 1950's and 1960's, or even earlier (Appendix III). Most of them have outlived their economic life. The long years of operation have resulted in decreases in flour mill capacities and recurring technical failures of the plants (EFC., 1985). Thus, the flour mills need replacement/modernization in Addis Ababa city in particular and in the country in general. Their location is concentrated in a few regional capitals, hence product

distribution and other benefits are still localized. The bakeries in Addis Ababa, however get their flour quotas from Nazareth, Debre Zeit or Awasa with all the inconveniences associated with the resulting transport problems. The flour produced in Addis Ababa, by contrast, is allocated to areas outside the city. The existing flour supply allocation policy is thus inconvenient for the city's bakeries. Moreover, during the time of input shortages, priority seems to be given to state and public bakeries in the supply of the raw material quotas. This has negative consequences for private bakery performances, interms of the quality of bread production. Private bakeries need more attention because they supply the major sector of the city's population.

The study indicates that the demand for bread in the city does not exceed the attainable capacity of existing bakeries. Rather raw material supply and allocation needs to be improved and the older brick-ovens bakeries should be modernized. Almost all the brick-oven private bakeries in Addis Ababa use fire-wood, which is scarce and costy, during the big rainy season, a period of high bread demand. The use of electricity is an expensive alternative under the present tariff.The writer thus recommends that the use of gas fired ovens be considered since it is much cheaper and the technology can be made locally (eg. the Daffur oven). It is thus suggested that the wider use of this type of gas-

DAFFUR

Fig. 20



oven be popularized since it would reduce the high rate (cost) of firewood consumption and consequently deforestation at the peripheries of the city.

Priority should also be given to the production of better quality bread of different shapes, weights and sizes. Bakery workers should be trained to be careful in the panning and depanning stages of their work since the survey of Kebele bread retailers indicated that the bread is often mishandled in the bakeries themselves.

The proportion of maize flour to be included in the wheat-maize composite flour is going to be reduced to 10 percent (EFC, 1988/89). In the writer's view, however, it is not the reduction of the 20 percent maize flour share from 20 to 10 percent that matters, the most important factor in the successful production of composite flour bread is strict adherence to the bread making recipe and the use of properly blended maize and wheat flour. Production of bread made from 75 percent wheat and 25 percent maize with the right recipe and procedure of baking is common in many parts of the world (UNECA, 1985, 74). It is not the use of composite flour that reduces bread quality in the city.

In the writer's view, the use of wheat-maize flour should continue, because the use of maize is a valuable form of import substitution (i.e.wheat by maize), which can help Ethiopia become more self-sufficient in food in the

foreseeable future (See also Appendix XV for a recipe and procedure for the production of pound loaves from 75 percent wheat, 25 percent maize mixed).

In the researcher's view there is a need for quality improvement in the production of maize flour in Ethiopia. The proper milling of maize require the complete removal of the hull and the germ of the maize before mixing it with what flour to produce composite flour bread. It is therefore, recommended that the mills producing maize flour should be located near a wheat mill and that it should be located near a wheat mill and that it should be mixed with wheat flour in wheat mill prior to distribution of the composite flour to end users (bakers). Machinery needs to be installed to ensure that the particle size of the maize flour is approximately the same as that of the wheat flour and should preferably be smaller to prevent segregation during transportation and storage.

The blending of wheat and maize flours in a suitable vertical cone mixer or in a horizontal drum mixer, also requires trained man power. Hence training programmes should be given priority in the milling Industry, in order to improve maize milling technology in Ethiopia.

The maintenance of strict quality control, however requires the creation of the necessary incentives for the city's bakers. For example if the retail price of bread was

increased and the raw material supply improved, quality would probably improve. More importantly, more competition between bakers is needed to induce them to improve quality control standards. This could be done by allowing the bakers to sell bread in their own shops. The existing policy does not stimulate competition and quality control.

Appropriate incentives for the city bakers, such as fixing fairer (i.e higher) consumer prices, letting the bakers sell fresh bread in their own shops and supplying all the bakers with the raw materials they need should be introduced so that the quality of bread will improve. The addition of "preservatives" (dried milk, edible fats, chemical additives etc.) which help the bread remain soft for a longer time, would add to production costs. So a price rise seems justified. The creation of competition among the bakers is essential for production improvement. So the bakers should be able to sell directly to consumers. This would increase competition between bakeries. The existing policy whereby most bread is sold by the Kebeles cannot stimulate competition among bakers (refer to 7.5 for details).

In the short run, while raw material shortages are likely to continue, it is recommended that the weight of each piece of bread be reduced. If the bakeries produced different smaller weights (eg. 62.5 or 100 gram) significant

advantages might be gained. For example volume of production, interms of pieces, could be increased and the number of pieces distributed per person could increase. Some relative demand satisfaction could be gained in this way (See Appendix XIV, XV, XVI). The production of smaller standard size bread at times of input scarcity could help ensure that the available supply was more evenly shared among all Kebele dwellers. It should be borne in mind, however, that any reduction in bread size would result in higher production costs, because scale economics would be lost in the production process.

The study revealed that the allocation of bread production depends on Kebele population size. The more people in Kebele, the more the amount of bread allocated to it. The spatial distribution of the quota was found to be fair with the respect to population. In all Kefetegnas the amount of bread delivered corresponded very closely to population size. However the study revealed that ratio of bread quota to population size, was not precisely according to policy guidelines. The analysis showed that all Kefetegnas were receiving slightly (< 5 percent) less bread than was dictated in the policy. This was one of the major complaints of the Kebele shops officials. The bread quota size to the Kebeles can not remain constant for many years. It has to account for the growth of population size. Thus,

the Kebeles bread quotas need regular modification to take account of the growing population. This would to a certain extent, reduce the growing disatsifaction of consumers, especially during the season of peak bread demand.

7.2 BREAD TRANSPORT SYSTEM

Of the three modes of transport used (foot, kushenet, vehicle) foot-transport is the most widely used, with vehicles next and Kushenet last. The bread outlets outside the government-controlled distribution scheme seem to use these methods of transport in similar proportion as well. The average distance between Kebele shops and bakery is found to be 2.8 km (two-way trip), the maximum being 13.9 km and the minimum 0.1 km (two-way trip).

The estimates of the marketing costs of bread for the 284 Kebele shops in birr/month revealed a high percentage share for transport (i.e. 42%). A surprising finding was that the cost of carrying bread by wheel-barrow (kushenet) was four times higher than transport by vehicles or by porter. The modified bread quota allocation is expected to consider proximity as one of the major criteria to minimize distance variations among Kebele shops and reduce transport costs. It seems that the amount of bread transported matters more than the distances to be covered interms of transport costs.

The study also revealed consumers as well as bakers are very critical about the poor bread handling and unhygienic conditions related to bread transport from bakeries. Bread often reaches consumers in a damaged and dirty condition. It is thus recommended that packaging and transport standards be improved and monitored to ensure the quality of bread and the health of consumers.

7.3 RETAILING SYSTEM

The results of the application of Tatarinov's mean-field model to the Addis Ababa bread market system indicates that Kebeles in Kefetegnas 9,5,6,7,1 and 14 are relatively well served. This tends to confirm the results of nearest neighbour analysis of bakeries which shows that Kebeles in Kefetegnas 5,6,9 and 14 have bakery distributions which were approaching the optimal uniform pattern. Analysis of the Kebele shops locations in Kefetegnas 2,5,7,9,13 and 14 also indicated that bread consumers are relatively well served because the pattern approaches the optimal uniform pattern.

Those Kefetegnas in the least favourable bread supply situations are 8, 16, 12, 17, 23, 20 and 15. By contrast the nearest neighbour analysis of bakery locations indicated that the neighbourhoods that deviated most from the optimal uniform pattern were Kefetegnas 12, 11, 19, 17, 24, 25, 3, 21 and 23. The location of Kebele shops in Kefetegnas 24, 25, 20, 23, 16, 17, 19 and 11 also deviated from the optimal uniform pattern.

In sum, the results of the nearest neighbour analysis tend to reject the research hypotheses formulated concerning the location of bakeries and Kebele shops in the city of Addis Ababa.

The study also revealed that, though limited in amount, the steady flow of low-price bread to the Kebele shops is appreciated by the city's growing number of bread consumers. The cost of obtaining bread, not just the money paid, but the cost interms of time, travel and disruption to other activity, has been very much reduced for most consumers. Thus selling bread through Kebele shops has improved it's accessibility. There were few complaints from consumers as to the hours of operation but most were very critical about the bread handling of the Kebele staff and the inefficient service with poor courtesy.

7.4 INCOME AND BREAD CONSUMPTION

The survey suggests that the bread eating habits of the people of Addis Ababa have grown since 1984/85 although he most favoured staple food still is, however, Enjera-bewat.

Previous income and expenditure surveys in the city by CSO and the 1988 survey by the researcher indicate that food consumer's behaviour conforms to Engel's law. Empirical analysis by the researcher, however, indicates that:-

On an annual expenditure basis, the upper income groups seem to spend more on bread. On a seasonal expenditure

basis, however, the lower income groups tends to spend more on bread, especially during the rainy seasons. In general, the bread expenditure by the low-income groups have increased considerably and are now almost the same as the upper income groups. The researcher feels that the increasing bread consumption by the poor is due mainly to the low prices offered by the Kebele shops, rather than by discriminatory quota allocations by the new bread distribution policy.

7.5 CONSUMERS, KEBELE OFFICIALS AND BAKERS ATTITUDES TO THE POLICY

The consumer attitudes survey indicated the general satisfaction of the city's consumers with the general operation of the new bread policy. The low-income consumers seem to be generally more satisfied, while the upper income bracket consumers are clearly dissatisfied with the low, uniform quality of bread sold in the Kebele shops. They strongly desire the availability of bread of different quality, sizes, prices and packaging.

The Kebele bread shop officials were generally satisfied with the new policy, although they, like the consumers, were critical of the low quality of bread, especially that supplied by private bakeries.

The bakery operators, the majority of whom are private bakery owners, were critical of the policy in general and

the supply of raw materials in particular. Most would prefer to sell their bread through private sector retail shops, including their own bakery shops.

7.6 MAJOR POLICY IMPLICATIONS

The state policy formulated and implemented in 1984/85 by the Ministry of Domestic Trade has served it's purpose but now inhibits the improvement and development of bread production in the city. Though the policy is still on paper it has virtually ceased operation since 1988, because of implementation problems (eg. raw materials) and because of reduced bread demand (due to some improvement in cereal supply). It is thus recommended that the existing bread marketing of bread be left to the city's baker's (Kebele, government, church, municipality and private). Left to themselves they would be able soon find out the different prices, qualities, sizes and wrappers that are desired by the city's consumers. Government control is no longer in the best interest of either the bakery owners or bread consumers.

Government involvement should focus on promoting improvements in policy such as quality standardization, man power training, improved technology adoption and price standardization for different types of bread; which are needed to ensure that more benefits are passed on to the consumers. The Ministry of Domestic Trade should be more

concerned with fixing the prices of different sized bread, creating the necessary control mechanisms as to the size, quality and packaging of the bread sold in the city.

In the writer's view it is also advisable that the bakeries under the Ministry of Domestic Trade, The Ethiopian Food Corporation and the Addis Ababa Municipality be organized under one unified management. This would hopefully lead to management improvements and the production of higher quantity bread. At the same time it is recommended that these high capacity modern bakeries establish a new bread distribution network, by selling through new bread shops (near the bakeries) and under contract through government supermarkets, private retailers and Kebele shops. In this way the government bakeries will be able to offer effective competition to the city's private, Kebele and church bakeries. In this way competition will be introduced and the resulting quality improvements will hopefully satisfy the consumers. The Ministry of Domestic Trade should be more concerned with fixing the prices of different sized bread, creating the necessary control mechanisms as to the size, quality, packaged of bread pieces available in the city.

The writer also recommends that the unified management of the government-owned bakeries in Addis Ababa should be controlled by the municipality, since this organization is most closely involved with meeting the everyday needs of the city population.

The consumer price of bread has remained constant since 1976 at considerable cost to the state. The state currently spends more than 45 million birr per year on bread subsidies. This subsidy should, gradually be reduced by raising the consumer price. The survey shows that almost two thirds of the consumers desired higher quality bread, even though this would mean higher bread prices. Price increases however, will require careful handling because it is a sensitive issue with strong political implications. The raising of the consumer price should however be accompanied by the up grading of bread quality and it's presentation. The 45 million birr/year bread subsidy would be better used to increase cereal production in the country, either in the state or peasant farm sector. Increased cereal production would tend to reduce the cost of food in the markets and in this way would compensate for higher bread prices. Moreover, high bread prices would be tolerated by the consumers, if they led to quality improvements. At the same time they would be appreciated by most of the city's bakers who have no incentive to improve the performance under the present policy.

It is the writer's view that all those involved in the bread industry desire the production and successful marketing of quality bread at reasonable prices. The aim of all those in the food production sector should be the supply

of affordable and nutritionally sound food to the consumers. To this end It is hoped that the data generated by this research and the new map of Addis Ababa's bread marketing system, will prove useful in improving the efficiency and equity of the city's bread marketing system.

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APPENDIX I - PART I QUESTIONNAIRE I (ENGLISH VERSION)

THESE QUESTIONNAIRES ARE TO BE FILLED OUT BY BREAD CONSUMERS'

QUESTIONNAIRE NO. _____

NAME OF INTERVIEWER _____

DATE _____

A. SOCIO- ECONOMIC CHARACTERISTICS OF CONSUMERS

1. Location:

   Higher _____ Kebele _____ House No._____

2. Family Size:

   Male_____ Female _____ Adults _____ Children____

3. Occupation of family head _____

4. The residence is :-

   a) Wholly occupied and owned by the family _____
   b) Shared with other family _____
   c) Rented _____
   d) Temporary _____

5. Type of residence [Interviewers observe]

   a) Apartment_____
   b) Villa _____
   c) Ordinary _____

6. The number of rooms in the residence is _____.

7. Area of the house (interviewers measure) _____.

8. The floor(s) of the residence is made of:-

   a) Tiles _____
   b) Wooden Board_____
   c) Cement _____
   d) Other _____

9. The family has a car?

a) Yes _____
b) No _____

10. The family has a servant?

a) Yes_____
b) No _____

B) **BREAD CONSUMPTION CHARACTERISTICS:**

11. What does the family usually take with tea for breakfast?

a) 'Enjera' _____
b) 'Kita' _____
c) 'Kocho' _____
d) Bakery bread _____
e) 'Difo Dabo' _____
f) Ambasha _____
g) Other [specify] _____

12. Does the family usually take bread for lunch?

Yes _____ No_____

13. Does the family usually take bread for dinner?

Yes _____ No _____

14. How much bread are you entitled to get (as per ration card) usually?

Yes_____ No _____

15. Do you buy all the bread you are entitled on the card?

Yes _____ No____

16. Why are you entitled to get only this much bread?

_____
_____

17. How does your family eat bread?

a) as alternative diet
b) as additional diet
c) both a and b

18. Do you get the desired quantity of bread from the kebele shop?
Yes_____ No _____

19. Do you always use your ration cards?
Yes_____ No _____

20. Describe the availability of bread in your kebele shop?

a) Usually not available_____.
b) Available for a few days in a week_____.
c) Available on fixed days _____.
d) Available every day of the week_____.

21. Is the size of the bread (125 grams) fair for the price it costs?
Yes_____ No_____

Give reasons for your answer _____
_____
_____

22. What was your bread (bakery) eating habit before 1977 E.C.?

a) The same as after 1977 E.C. _____
b) Not as frequently as after 1977 E.C. _____
c) Rarely eating bakery bread_____
d) _____ (any other)

23. What was your attitude towards bread before 1977 E.C.?

a) Bread was a luxurious item _____.
b) Bread was eaten only when there was no "Enjera" or any other more traditional food items_____.
c) Bread was preferred to enjera_____.
d) Other (Specify)

24. What is your attitude now?
a) bread is a luxurious item_____
b) bread is eaten when there is no "Enjera"_____
c) bread is preferred to "Enjera"_____
d) bread eating is expensive_____

25. What was the most favoured food before 1977 E.C.?
_____
Why was it favoured by your family?
_____
_____

26. Have you eaten bakery bread more frequently after 1977 E.C. Because of Shortages of cereals?
Yes_____ No_____

27. Do you think your eating habit is somehow changed since 1977 E.C.?
Yes_____ No_____

If yes, why?_____

28. Do you think that there will be more bread demand in your kebele next year?
Yes_____ No_____

29. If yes, why do you think there will be more bread demand next year in your kebele? because:-

a) of more population _____
b) bread eating habit of the people will increase_____.
c) Scarcity of bread supply_____.
d) Other (specify)_____.

30. Give reasons as to why bread consumption has been increasingly high in your kebele since 1977 E.C.

_____
_____
_____
_____

31. Does the family more frequently eat bakery bread this year than last year?
Yes_____ No_____

If yes, why?_____
If no, why not?_____

32. Do you want to add more bread in your ration card for next year?
Yes_____ No_____

C. BREAD BUYING BEHAVIOUR:

33. What is the location of the kebele shop from your home?
a) near_____
b) far_____
c) conveniently_____
d) not conveniently_____

34. Who in this family (household) buys the bread?
    a) housewife_____
    b) daughter_____
    c) son_____
    d) husband_____
    e) servant_____
    f) other (specify)

35. How long (time) does it take from your home to kebele shop?_____

36. Do you frequently buy the bread you are entitled according to your ration cards?
    Yes_____ No_____

37. Did you buy all the breads you are entitled according to your card last week?
    Yes_____ No_____

38. What suits you best?
    a) buying bread from open market_____
    b) buying bread from kebele shop_____
    c) buying bread from bakeries_____

39. How often do you use the following for bakery bread buying? (use "always", "rarely", "not at all")
    a) private groceries_____
    b) bakeries_____
    c) "gullet" markets_____
    d) others (specify) _____

40. What is your first choice for future bakery bread buying?
    a) private groceries_____
    b) bakeries_____
    c) "gullet" market_____
    d) kebele shop_____

41. Give your main reasons for your choice above?
    _____
    _____
    _____

42. When do you usually buy bread from kebele shop?
    a) 5 to 6 a.m. _____
    b) 6 to 8 a.m._____
    c) any morning hours_____
    d) any afternoon hours_____
    e) _____(the time you buy)

43. Why do you think the price of 125 grams of bread low?
    a) it is subsidized bread_____
    b) the quality of bread is low_____
    c) At the loss of the kebele shops_____

D. **QUALITY OF SERVICE AT KEBELE SHOPS:**

44. Do you think there is enough bakery bread in the kebele shop to satisfy all people in the kebele every day?

    Yes_____ No_____

45. Is bread available in the kebele shop through out the day?

    Yes_____ No_____

46. Does the bread you buy from kebele shop have good taste?
    a) yes always_____
    b) yes sometimes_____
    c) no_____

    If no, why?_____
    _____
    _____

47. Is there any quality differences between bakery breads available in kebele shops and that of private groceries?
    Yes_____ No_____

    If yes, why?_____

48. Which composite bread flours do you prefer?
    a) wheat-sorghum breads _____
    b) wheat-millet breads_____
    c) wheat-maize breads_____
    d) wheat only breads_____

49. Which of the following ingredients of breads, do you think lack more the bread you get from kebele shop.
    a) yeast_____
    b) salt_____
    c) sugar_____
    d) oil_____
    e) flour quality in low_____

50. Do you support the idea of non-wheat substitutes for the flour of bakery breads?
Yes_____ No_____

51. Give reasons for your answer above?
_____
_____

52. How should bread be provided?
a) with different size_____
b) with different shape_____
c) with wrapper_____

53. What is cheapest for you?
a) buy flour and prepare bread at home_____
b) buy bread from kebele shops_____
c) buy bread from near by shops_____
d) buy any cereals to prepare food_____
e) other (specify)

54. How much did you spent on bread last week (last 7 days) for your family?

55. Which is cheaper for your household's monthly expense?
a) buy teff from kebele enough for a month_____
b) buy wheat from open market for a month_____
c) buy breads from kebele shop for a month_____

56. Do you buy bread from kebele shops because it is cheaper than other cereals in the open market?
Yes_____ No_____

57. Give reasons for your answer? _____
_____

58. Is it better to raise the price of bread provided that the size, shape, weight of breads vary?
Yes_____ No_____

59. Do you buy bread from shops because there is no or less supply of cereals in the kebele cooperative shop?
Yes_____ No_____

60. Give reasons for your answer?_____
_____

61. Which of the following applies to you?
a) I usually buy bread from kebele shop because it is cheap_____.
b) I buy bread from kebele because there is no enough cereal supply in the kebele_____.

c) I buy bread because cereals are more expensive in the open market_____.
d) I buy bread because it does not need much preparation to eat_____.
e) I buy bread because we like its taste_____.
f) I buy bread because it is available near buy_____.
g) other (specify)_____.

62. For how long do you normally stay in the kebele shop to get bread?
_____hours/minutes.

63. Do you form a queue for a long time before getting bread in the shop?
a) yes always_____
b) sometimes_____
c) no_____

64. Describe the kebele shop staff efficiency in serving you?
a) efficient_____
b) usually efficient but not always_____
c) not efficient_____

65. Do the kebele shop staff serve you with good courtesy?
Yes_____ No_____

66. How long is the bread shop open daily?
a) all morning hours_____
b) all afternoon hours_____
c) for one hour only_____
d) for two-three hours_____
e) the whole day_____

67. Does the bread distribution through kebele shops lessen your problem of getting bread?
Yes_____ No_____

68. Did you have problem of getting bread at a reasonable cost before the supply of it through kebele shops?
Yes_____ No_____

If yes, why? (give reason) behind your problem?
If no, why not? (give reason)_____
_____

69. There were problems of getting bread before 1977 E.C. (before bread supplies through kebele shops)
a) getting in time_____
b) " " short travel_____

c) getting in at our conveniences_____
d) any other problem_____

70. Do you like the kebele's role in bread selling system?
Yes_____ No_____

71. Give reasons for your answer above?
_____
_____

72. Do you want the new bread supply system to continue?
Yes_____ No_____

If yes, what are the main advantages in your opinion?
_____

73. What do you like most about?
a) the price of bread is low_____
b) the cost in terms of time to get bread from kebele shop is low_____

c) the travel to the shop is short_____
d) the disruption to other activities incurred is minimal_____

74. Any problems encountered because you buy bread from kebele shop.

Problems	Possible Causes
1._____	1._____
2._____	2._____
3._____	3._____
4._____	4._____

75. What improvements do you suggest for better supply of bread through kebele shops?
_____
_____
_____

76. Could you give a rough estimates of the amount you spent last week? or in a month?
a) food _____birr
b) bread_____ birr

77. Total monthly family income in birr?
a) less than 300_____
b) 300 - 600 _____
c) more than 600 _____

78, From the point of view of the present bread distribution policy, which of the following is the main problem?

a) poor bread quality_____

b) no production of bread with different shape, size,weight_____

c) no bread wrapper_____

79. Do you suggest that bread production and distribution be left to private bakery owners?

Yes_____ No_____

80. List your nationality?

_____

_____

APPENDIX I PART II

QUESTIONNAIRE II (ENGLISH VERSION)

TO BE FILLED OUT BY BAKERY OWNERS

1. Name of bakery_____
2. Year of establishment_____
3. Attainable capacity _____
4. Flour quota from EFC _____
5. Location :

   Higher Kebele_____ Kebele_____ House No._____
6. Number of shifts_____
7. Number of employees_____
8. Number of working days_____
9. Amount of production per year_____
10. Amount sold in a year_____
11. Type and cost of raw materials used?

A)	Local	Cost in Birr
	1. Wheat_____	_____
	2. Salt_____	_____
	3. Oil _____	_____
	4. Others (Specify) _____	_____
B)	Imported	
	1. Yeast_____	_____
	2. Other (Specify) _____	_____

12. Do you have any marketing problems?

Yes_____ No_____

If yes, list the problems in order of importance and possible causes for the problems?

_____
_____
_____

B) Do you have any production problems?

Yes_____ No_____

If yes, list in order of importances with their causes.

_____
_____
_____

C) Do you have any labour problems?

Yes_____ No_____

If yes, list in order of importances and their possible causes?

_____
_____
_____

D) Do you have any management problems?

Yes_____ No_____

If yes, why?_____
_____
_____

13. Which problems hinder the growth of your bread production? write number 1 to 12 in order of importance?

- shortage of raw material_____
- the new bread distribution system_____
- Transportation problem
- government interferences_____
- kebele interferences_____
- supply bread with such a low price_____
- old age of equipments_____
- capital shortage_____

- marketing problem_____
- management weakness_____
- workers and owners bad relations_____
- skilled man power shortage_____

14. How has the new bread distribution system affected your business?

a) positively i.e list advantages.

_____
_____
_____
_____

b) negatively i.e. list disadvantages.

_____
_____
_____
_____

15. Would you prefer to sell your production through open market?

Yes_____ No _____

If yes, why?_____
_____
_____

16. Do you have your own retailing shop?

Yes_____ No_____

17. Which of the following are your preferred customers?

	Rank of Choice	Reasons
a) private retailers	_____	_____
b) government owned whole-sellers(eg. EDDC)	_____	_____
c) Individual buyers	_____	_____
d) public agents eg. kebele	_____	_____
e) street vendors	_____	_____

18. Has the new system caused any changes in the quality the bread you make?

Yes_____ No_____

If yes, What changes? _____
_____

19. How would you rank the quality of your bread?
    a) very high_____
    b) high_____
    c) medium_____
    d) low_____
    e) very low_____

20. If bread quality is ranked below average (i.e. medium), What are the reasons for the low quality of bread you produce?
_____
_____
_____
_____

21. Which kebeles get their bread from your bakery?

Name of kebeles	Distance from bakery
_____	_____
_____	_____
_____	_____

22. Do the assigned kebeles collect their quota in time?
    a) Yes_____ b) No_____

23. Do you use your own transportation to deliver bread to the kebeles?
    a) Yes_____ b) No_____

If yes, what type?_____
_____
_____

If no, how does the kebele collect from your bakery?
_____
_____
_____

24. Do you have a fixed time for the supply of bread to kebeles?

a) Yes_____ b) No_____

If yes, when?_____
_____

25. Do you sell all of your bread production to the kebeles?
a) Yes_____ b) No_____

If no, where do you sell the rest?
a) your shop_____
b) others (specify)_____

26. Do you have any suggestions about how to improve bread marketing in Addis Ababa?
_____
_____
_____
_____

27. How do you rate the taste of the bread you produce?

a) very good_____
b) good_____
c) fair_____
d) not very good_____
e) poor_____

Thank you, I appreciate the time you have given to the study.

APPENDIX I - PART III

QUESTIONNAIRE III (ENGLISH VERSION)

TO BE FILLED OUT BY KEBELE/ CONCERNED OFFICIALS

1. What is your responsibility in the kebele?

   _____

2. Number of days the shop is open in a week?

   _____

3. Sales hours of bread in the shop?

   a) _____a.m. to _____a.m.
   b) _____p.m. to _____p.m.
   c) the whole day_____

4. When did the bread shop start serving the community? _____E.C.

5. Name the bakery or bakeries from where you get bread for sale _____
   _____

6. Are these bakeries the kebele committee choices?

   Yes_____ No_____

7. Who assign the bakeries for your cooperative shop?
   _____

8. Does the kebele own its bakery?

   Yes_____ No_____

9. Do you have a plan to have your own bakery?

   Yes_____ No_____

10. All the expenses incurred by the kebele shop during purchases, selling of bread to the consumers in a month.

    a) wages of workers/distributors/ _____
    b) perdiem (if any)_____

    c) cost of transport from bakery to kebele _____
    _____

d) rent (if any) _____
e) loading and unloading bread_____
f) other bills (specify)_____

11. What means of transport do you use to bring bread from bakeries?
a) man power_____
b) vehicle (small)_____
make_____ year_____ engine size _____ cargo capacity_____
c) mini bus_____
d) animals_____
e) any other (specify)_____

12. How many times in a day do you transport from bakery to kebele shop? when?

a) one time_____ hours_____
b) two times _____ hours _____
c) three times _____ hours _____

13. Who covers the transportation costs of bread to kebele shops?
a) the kebele itself_____
b) the bakery _____
c) the community by fund raising_____

14. Do citizens in this kebele play any part in transporting bread from the bakery to the kebele shop?

Yes_____ No_____

15. Do you have storage and transportation problem?

Yes_____ No_____

16. How many pieces of bread (125 grams) do you get per day?

_____

17. Is all the bread sold each day?

Yes_____ No_____

If no;

a) What is done with the remaining bread?
_____

b) How much is left unsold each day?
Maximum_____
Minimum_____
Average _____

c) Reasons for unsold bread?
_____
_____
_____

18. Do you think the kebele gets enough bread to satisfy the bread needs of the citizens in your kebele?

Yes_____ No_____

19. Does the kebele earn enough money to cover its expenses for selling?

Yes_____ No_____

a) If yes, do you make a profit by selling bread?

Yes_____ No_____

b) If yes, a) how much per day_____
b) how much per quota_____

If no, from where do you get money for the expenses?
_____

20. Do you think the buying capacity of the consumers be reduced because the supplied bread is of no better quality, different size, shape and weight?

Yes_____ No_____

21. Is the needs of bread consumption associated with the availability or scarcity of cereals in the market?

Yes_____ No_____

22. Do you support the government control of bread distribution?

Yes_____ No_____

23. Do you think the present bread distribution policy needs reconsiderations?

Yes_____ No_____

24. Do you think the bread consumption habit of the Addis Ababa population has permanency?

Yes_____ No_____

25. Why, do you think, does the bread consumption in your kebele reduced now?

_____
_____
_____
_____

26. Can the kebele get enough cereals for sale to consumers instead of bread?

Yes_____ No_____

27. Are there official guidelines from higher power organs as to when to collect and when to sell bread in the kebele shop?

Yes_____ No_____

If yes, list them

_____
_____
_____
_____

28. To whom do you report to in case there is no supply or low supply of bread from bakeries.

_____

29. Will the bread distribution through this kebele shop continue in the future?

Yes_____ No_____

30. Does the kebele need more bread than the quota it has?

Yes_____ No_____

If yes, how many more pieces (125 grams) per day are needed?

_____

31. What is the base for the kebele bread quota?

a) population number_____
b) availability of bread_____
c) any other (specify)_____

32. Which months of the year have low bread consumption?

_____

_____

33. List the following in relation to bread supply to consumers through kebele shops?

	PROBLEMS ENCOUNTERED	POSSIBLE CAUSES	POSSIBLE REMEDY
A.	With bakeries		
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
B.	Transportation Problem		
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
C,	Other problems (specify)		
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

34. List the advantages achieved because bread is distributed through kebele shops?

_____

_____

_____

_____

35. What do you think were the reasons for government intervention (1985) in the supply of bread to consumers?

_____
_____
_____
_____

Thank you for your cooperation in this study.

APPENDIX I - PART IV

QUESTIONNAIRE IV (ENGLISH VERSION)

TO BE FILLED OUT BY CONCERNED OFFICIALS OR EXPERTS IN THE CONCERNED GOVERNMENT OFFICES OR PUBLIC ORGANIZATIONS.

1. Name of the Organization_____

2. Position of the respondent_____

3. What are the government ministries, organizations that have active roles in the bread production, distribution and marketing in Addis Ababa?

Names	Roles of the organization

4. What is the relationship between the Ethiopian Food Corporation and the bakeries in the city of Addis Ababa.

_____
_____
_____
_____
_____

5. Is there any organization chart showing the relationship of the concerned organizations' bread production, distribution and marketing?

Yes_____ No_____

If yes, show the chart.
If no, how do they coordinate the work?

_____
_____
_____

6. Who are involved in the key decisions concerning the following?

Variables for Decisions	Who	When	Where	How
a. Total bread Production				
b. Quotas for bakeries				
c. Quota for each kebele				
d. Ration for each households				
e. Price of bread				
f. Quality of bread				
g. Weight & size of bread				
h. Presentation of bread				

7. Which organizations are involved in the planning work of:-

a) bread production _____

_____

_____

b) bread distribution _____

_____

_____

c) bread marketing _____

d) bread rationing _____

e) bread pricing _____

8. Which organizations are involved in the plan implementation?

_____

9. Which organizations are involved in plan review, evaluation or monitoring work?

_____

10. Do the concerned organizations have long term and short term plans?

Yes_____ No_____

If yes, list them down?

_____

If no, why?

_____

11. What are the main reasons for the new bread distribution system?

a) _____
b) _____

c) _____

d) _____

12. Has the new bred distribution system achieved its economic, political, social etc. objectives?

a) Yes_____ No_____

If yes,

What are they?	How are they achieved
_____	_____
_____	_____
_____	_____
_____	_____

If no; why?

_____
_____
_____
_____
_____

13. Are all bakeries expected to produce the same quality of breads?

Yes_____ No_____

14. Is there problem of bread marketing this year?

Yes_____ No_____

If yes; why?

_____
_____
_____
_____

15. How does the concerned organization make sure that bakeries use flour to make bread?

a) In registered volume _____
_____

b) In registered quality _____
_____

16. Are bakeries expected to use their flour quota only in the form of bread?

Yes_____ No_____

If no; how does the concerned organization ensure that bakeries produce planned amounts of bread?

_____
_____
_____

17. How much flour is usually distributed to bakeries at a time?

a) enough for a day_____
b) enough for a week_____
c) enough for a month_____

18. Who delivers the following items to bakeries?

a) Flour_____
_____
b) Yeast _____
_____
c) Sugar_____
_____
d) Salt _____
_____
e) Others/specify/ _____
_____
_____

19. Are bakeries expected to report in case of not working?

Yes_____ No_____

20. Exactly to which organization should they report if they face:-

a) production problem_____
_____
b) distribution problem_____
_____
c) marketing problem _____
_____

21. Do all bakeries collect their quota of flour on time?

Yes_____ No_____

If no, what happens to bakeries which do not collect flour on time?

_____
_____
_____
_____

22. What are the most important sources of flour used by E.F.C.

a) locally produced_____
b) imported_____

23. What are the main problems faced by E.F.C. in areas of:

a) Flour supply_____
_____
_____
_____

b) Yeast _____
_____
_____
_____

c) Other/specify/
_____
_____
_____
_____

24. List the main problems that impair the successes of the new bread supply systems?

Problems	Possible Causes if any	Possible remedies if any
a) Input problem		
b) Production problem.		

c) Marketing problem. _____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

d) Others / specify/ _____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____

25. Is there a plan to extend the new bread distribution system to other urban centers in the country?

Yes_____ No_____

If yes, when?_____

_____

How? _____

_____

_____

26. What is the future trend of the programm?

_____

_____

_____

27. How do you rate the taste of bread distributed through kebele shops?

a) very good_____
b) good_____
c) fair_____
d) not very good _____
e) poor_____

28. Why don't bakeries produce bread according to their maximum capacities?

_____

_____

_____

_____

29. How do government bakeries distribute their bread production?

_____
_____
_____

30. What are the main evidences for the current low demand of bread?

_____
_____
_____

What are the reasons?

_____
_____
_____

31. What are the reasons that government bakeries do not produce better quality breads?

_____
_____
_____
_____

32. What steps are taken by the Ministry of Domestic Trade to solve the current problems of bread distribution?_____

_____
_____

33. Is there any government guidelines as to how to control the bread quality that are distributed through kebele shops?

Yes_____ No_____

If yes, state the guidelines:

_____
_____
_____

34. The new policy guidelines

a) Encourage private bakeries to produce according to the set quota? _____

b) Do not give any attention as to how to control bread quality_____

c) Discourage the spirit of competition among bakeries

_____

d) Give assurance to bread marketing

_____

e) Others/specify/ _____

_____

35. Is there coordination among the six types of bakery ownerships? /private, municipality, kebele, Ministry of Domestic trade and other organizations/

Yes_____ No_____

If yes, how are they coordinated?

_____

_____

_____

36. What is the main reason for the Ministry of Domestic Trade to be one of the bakery owners in Addis Ababa?

_____

_____

_____

_____

37. Do you think it will be more effective if organized all the bakeries under one organization or administration?

Yes_____ No_____

If yes, How?

_____

_____

_____

_____

_____

_____

If no; why?

_____

_____

_____

_____

Thank you for your cooperation in this study.

APPENDIX II

BREAD SUPPLY SYSTEM BASIC DATA AT KEBELE LEVEL

Bread Retailers' Shops (Kebele Location)		Bread Quota In Kg/Year (Xi)		Population Size		Percapita Consumption (kg/person)		No.of Kebeles	Mean (X) Kefetegna Level		S.D. (Kefetegna level)		Bakeries Location		Distance (d)	Distance in km/kg (d x i.e transportation work)
Kefetegna	Kebele	1985-1986	1987-1988	1985-1986	1987-1988	1985-1986	1987-1988		1985-1986	1987-1988	1985-1986	1987-1988	1985-1986 Kefetena/Kebele	1987-1988		
4	26	396,000	400,500	12,396	13,467	31	29.74						4/26	4/26	.05	55.00
	27	144,000	144,000	4,650	4,840	31	29.75						4/27	4/27	.05	20.00
	28	166,500	198,000	6,373	6,634	26	29.85						5/19	5/14	.9	416.25
	29	144,000	180,000	5,780	6,017	25	29.92						5/19	4/27	1.65	660.00
	35	90,000	103,500	3,302	3,438	27	30.10						5/19	5/22	1.53	382.5
	36	301,500	387,000	12,430	12,940	24	29.90						5/19	5/22	1.14	954.75
	37	180,000	180,000	5,633	5,864	32	30.70						5/17	5/17	1.35	675.00
	38	103,000	103,500	3,326	3,463	31	29.84						5/19	5/19	1.95	560.625
	39	126,000	144,000	4,616	4,805	31	29.97						5/18	5/18	1.47	514.5
	40	135,000	139,500	4,457	4,640	31	30.10						4/40	4/40	.05	56.25
	49	90,000	94,500	3,037	3,162	30	29.89						4/27	4/27	1.14	285.00
	50	144,000	153,000	4,850	5,080	30	30.12						4/27	4/27	1.92	768.00
								12	28.80	29.99	2.7	.25			13.3	=5347.88
5	05	94,500	103,500	3,398	3,537	28	29.26						5/05	5/05	.08	21.00
	06	126,000	157,500	5,087	5,296	25	29.74						5/06	5/06	.11	38.50
	07	292,500	337,500	10,946	11,395	27	29.62						5/06	5/06	.95	771.88
	12	126,000	166,500	5,433	5,656	24	29.44						5/05	5/05	.75	262.5
	15	220,500	243,000	7,895	8,219	28	29.57						5/19	5/22	.44	269.5
	16	18,000	198,000	6,317	6,576	30	30.11						5/19	5/16	.08	40.00
	17	162,000	148,500	4,546	4,733	36	31.38						5/18	5/12	.47	164.5
	18	126,000	139,500	4,462	4,645	28	30.03						5/18	5/18	.05	17.5
	19	220,500	243,000	7,886	8,210	28	29.60						5/18	5/18	.86	526.75
	20	202,500	216,000	7,019	7,307	29	29.60						5/18	5/18	1.16	652.5
	21	216,000	247,500	7,648	7,962	28	31.10						5/12	5/12	1.46	876
	22	211,500	229,500	7,349	7,651	29	30.00						5/12	5/12	.30	176.25
	23	126,000	180,000	5,786	6,023	22	29.90						5/18	5/18	1.98	891.08
								13	27.9	29.95	3.2	0.6	5/18	5/18	8.69	4707.88
6	01	234,000	225,000	7,224	7,520	32	29.92						6/02	6/02	0.8	520
	02	108,000	117,000	3,793	3,949	28	29.63						6/02	6/02	.21	63
	03	144,000	153,000	4,984	5,189	29	29.49						5/06	5/05	1.05	420
	04	108,000	117,000	3,767	3,922	29	29.78						6/02	6/02	.83	360.125
	08	189,000	202,500	6,554	6,823	29	29.68						6/08	6/08	.09	47.25
	09	135,000	144,000	4,684	4,876	29	29.53						6/02	6/02	.71	266.25
	10	180,000	198,000	6,321	6,580	28	30.10						5/05	5/05	1.05	525.00
	11	108,000	112,500	3,693	3,845	29	29.26						5/05	5/05	.63	189.00
	13	279,000	270,000	9,884	10,290	28	26.24						6/13	6/13	.09	69.75
	14	216,000	202,500	6,417	6,680	34	30.31						5/17	5/17	1.43	858.00
	24	126,000	126,000	3,613	3,761	35	33.50						5/17	5/17	2.27	794.5
	25	189,000	198,000	6,383	6,645	30	29.80						6/25	6/25	.05	26.25
								12	30.0	29.77	2.3	1.51			8.49	4139.13

24	09	315,000	333,000	10,778	11,220	29	29.68						24/09	24/09	.09	78.75
	10	162,000	171,000	5,512	5,738	29	29.80						24/10	24/10	.08	36.00
	11	297,000	371,000	11,322	11,787	25	31.48						24/09	24/11	2.66	2194.50
	12	189,000	207,000	6,698	6,973	28	29.69						24/09	12	.08	42.00
	13	396,000	432,000	13,846	14,417	28.6	29.96						24/13	24/09	4.01	1447.5
	14	144,000	162,000	5,249	5,464	27	29.65						24/14	24/14	.11	90.00
	15	270,000	265,500	8,498	8,847	32	30.01						24/15	24/15	.12	2227.5
	17	198,000	189,000	6,098	6,348	32	29.77						24	12	4.05	
								8	28.8	30.01	2.2	.571			11.2	6160.25
25	01	180,000	216,000	6,924	7,208	26	29.97						9/10	9/19	4.14	2070
	02	76,500	81,000	2,600	2,707	29	29.92						9/10	9/19	4.15	881.88
	03	135,000	171,000	5,558	5,786	24	29.55						25/03	25/03	.08	30.00
	04	292,500	306,000	9,903	10,309	30	29.68						24/09	24/09	2.31	1876.88
	05	135,000	103,500	3,330	3,467	41	29.85						24/09	24/09	2.15	806.25
	06	135,000	202,500	6,461	6,726	21	30.11						25/05	25/06	.11	41.25
	07	180,000	207,000	6,639	6,911	27	29.95						25/07	25/07	.03	153.75
	08	135,000	130,500	4,165	4,336	32	30.10						25/08	25/08	.15	56.25
	16	171,000	207,000	6,596	6,867	26	30.14						25/16	25/16	.08	30.00
								9	28.40	29.92	5.4	.189			13.47	5946.25
3	30	225,000	256,500	7,939	8,264	28	31.03						3/30	3/30	.09	56.25
	31	193,500	225,000	7,141	7,433	27	30.27						3/30	3/30	.72	387.00
	32	216,000	220,500	7,107	7,398	30	29.8						5/19	5/19	1.43	858.00
	33	153,000	153,000	4,863	5,062	31	30.23						2/11	2/11	1.53	650.25
	34	103,500	144,000	4,576	4,763	23	30.23						2/11	2/11	6.90	2760.00
	41	121,500	135,000	4,412	4,591	28	29.41						3/30	5/18	.45	151.875
	42	202,500	238,500	7,440	7,445	27	30.79						3/30	3/30	.51	286.875
	43	211,500	216,000	6,975	7,261	30	29.75						5/19	5/19	1.29	757.875
	44	252,000	283,500	9,128	9,502	28	29.84						5/07	5/07	.92	644.00
	45	94,500	99,000	3,189	3,320	30	29.82						5/19	5/19	1.41	370.125
	47	139,500	135,000	4,337	4,518	32	29.88						5/19	5/19	1.37	530.875
	51	67,500	81,000	2,468	2,569	27	31.53						3/51	22/63	.08	15.00
	52	54,000	63,000	1,922	2,001	28	31.45						3/51	3/51	.35	52.5
	53	171,000	175,500	5,629	5,860	30	29.95						5/19	5/19	2.30	862.5
							29.95	14	28.5	30.28	2.16	.64			19.35	8383.125
20	28	97,630	76,500	2,483	2,585	39	29.60						23/08	23/08	1.38	241.5
	29	132,165	99,000	3,196	3,327	41	29.76						23/08	23/08	1.74	413.25
	38	121,500	139,500	4,431	4,613	27	30.24						18/15	20/48	1.19	401.625
	39	67,500	81,000	2,593	2,699	26	30.01						18/15	18/15	1.08	202.5
	40	157,500	148,500	4,820	5,018	33	29.59						18/15	20/48	1.67	730.625
	42	225,000	225,000	7,264	7,562	31	29.75						20/42	20/42	0.05	31.25
	43	236,835	180,000	45,855		40									2.13	905.25
	44	137,835	103,500	3,307	3,443	42							23/08	23/08	2.60	650.00
	45	258,165	193,500	6,220	6,475	42	29.38						23/08	23/08	2.36	1091.5
	46	239,220	180,000	5,746	5,982	42	30.31						23/08	23/08	2.13	905.25
	51	236,745	175,500	5,705	5,939	41	29.55						23/08	23/08	3.27	1389.75
	52	220,275	166,500	5,318	5,536	41	30.10						23/08	23/08	3.96	1534.5
	53	118,485	90,000	2,633	2,637	45	34.13						23/08	23/08	4.19	890.375
								13	37.69	30.2	5.99	.21			27.8	9387.4

21	01	171,000	198,000	6,386	6,648	27	29.78						3/51	3/51	1.65	783.75
	04	135,000	135,000	4,411	4,592	31	29.40						3/51	3/51	1.20	450.00
	09	251,820	166,500	5,421	5,643	46	29.51						23/08	22/03	2.46	1107.00
	10	76,500	90,000	2,789	2,903	27	31.00						21/09	22/03	.41	87.125
	11	130,500	130,500	4,266	4,441	31	29.34						21/09	21/04	.81	293.625
	12	72,000	76,500	2,346	5,459	31	29.68						21/09	22/03	.95	190.00
	13	126,000	103,500	3,285	3,420	36	30.26						21/09	21/04	1.10	385.00
	14	99,000	103,500	3,350	3,487		29.68						21/09	21/04	1.17	321.75
	19	99,000	108,000	3,472	3,615	29	29.88						21/19	21/19	.11	30.25
	20	121,500	126,000	4,016	4,182	30	30.13						21/09	21/04	1.17	394.88
	21	85,500	90,000	2,890	5,009	30	17.97						21/19	23/08	.78	185.25
	22	201,645	157,500	5,005	5,210	40	30.23						23/08	23/08	2.94	1102.50
	23	166,500	193,500	6,299	6,557	26	29.51						21/23	21/19	1.68	777.00
	24	211,500	243,000	7,807	8,127	27	29.90						21/19	21/19	2.21	1298.38
	25	112,500	153,000	4,900	5,101	23	29.99						18/15	21/04	.21	65.63
	30	121,500	135,000	4,377	4,557	28	29.62						21/09	21/04	1.37	462.38
	31	175,500	162,000	6,617	6,889	27	23.52						22/03	21/04	1.92	936.00
	32	103,500	117,000	3,834	3,991	27	29.73						20	48	.77	221.38
								18	30.4	28.93	5.45	3.1			22.91	9091.88
22	01	265,500	297,000	9,552	9,940	28	29.88						4/27	4/27	2.52	1858.50
	02	148,500	171,000	5,531	5,758	27	29.70						22/03	4/27	.17	70.13
	03	148,500	175,500	5,640	5,871	26	24.78						22/03	4/27	.65	268.13
	04	130,500	148,500	4,823	5,021	27	29.58						22/03	4/27	.53	192.13
	06	103,500	139,500	4,447	4,630	23	30.13						4/27	4/27	2.57	738.88
	07	175,500	162,000	5,244	5,459	33	29.68						22/03	22/03	2.37	1155.38
								6	27.33	28.96	2.98	1.88			8.81	4283.13
23	08	250,425	180,000	5,861	6,101	43	29.50						23/08	23/08	.81	81.00
	09	139,500	153,000	4,927	5,129	28	29.83						23/09	23/09	.05	19.38
	10	402,660	301,500	9,678	10,075	42	29.93						23/08	23/08	.90	652.5
	11	301,590	252,000	8,067	8,398		30.01						23/08	23/08	4.64	2494.00
	12	308,340	211,500	6,838	7,119	45	29.71						23/08	23/08	1.52	836.00
	13	333,990	252,000	8,087	8,419	41	29.93						23/08	23/08	1.31	786.00
	14	219,960	166,500	5,356	5,576	41	29.86						23/08	23/08	2.78	1077.25
	15	291,960	180,000	7,158	7,452	34.70	24.15						23/08	23/08	3.06	1606.50
	16	229,500	256,500	8,238	8,576	28	29.91						23/12	23/12	2.31	1472.63
								9	38.44	29.2	5.93	1.79			16.75	9092.63
15	19	216,000	207,000	6,683	6,957	32	29.75						13/10	13/10	2.46	1476.00
	20	130,500	139,500	4,524	4,710	29	29.62						13/10	13/10	1.65	598.13
	23	211,500	315,180	6,829	7,109	46	29.75						14/24	14/24	1.95	1145.63
	26	153,000	166,500	5,384	5,605	28	29.71						14/07	14/07	1.95	822.75
	27	130,500	144,000	4,692	4,885	28	29.48						15/26	15/26	0.60	217.50
	28	99,000	108,000	3,505	3,649	28	29.60						15/26	15/26	1.47	404.25
	29	94,500	99,000	3,152	3,281	30	30.17						15/26	15/26	1.95	511.88
	30	151,785	117,000	3,742	3,896	41	30.01						14/24	14/24	2.36	678.50
	31	108,000	121,500	3,872	4,031	28	30.14						15/26	15/26	1.02	306.00
	32	94,500	99,000	3,323	3,459	28	28.62						15/26	15/26	1.16	304.50
	33	126,000	148,500	4,711	4,904	27	30.28						13/10	13/10	3.05	1067.50
	34	76,500	90,000	2,863	2,981	27	30.19						15/26	15/26	1.41	299.63
	35	58,500	67,500	2,125	2,212	28	30.52						15/26	15/26	1.86	302.25
	36	108,000	121,500	3,936	4,097	27	29.66						15/26	15/28	1.70	510.00
								14	30.53	29.82	5.53	.45			24.6	8647.50

16	01	117,500	121,500	3,865	4,024	30	30.19						13/11	13/11	1.35	438.75
	02	112,500	117,000	3,721	3,874	30	30.20						13/11	13/11	1.17	365.63
	03	117,000	90,000	2,944	3,063	40	29.38						16/03	16/03	0.06	19.50
	04	153,000	180,000	5,717	5,951	27	30.25						13/10	13/10	2.55	1083.75
	05	67,500	76,500	2,447	2,547	28	30.04						13/10	13/10	2.72	510.00
	06	112,500	130,500	4,154	4,324	27	30.18						13/10	13/10	2.15	671.88
	07	184,500	184,500	5,940	6,184	31	29.84						16/07	16/07	.74	379.30
	08	139,500	157,500	5,074	5,282	27	29.82						16/08	16/08	.80	310.00
	09	108,000	126,000	4,079	4,246	26	29.67						13/10	13/10	3.84	1152.00
	10	81,000	94,500	2,995	3,118	27	30.31						13/10	13/10	3.11	699.75
	11	144,000	171,000	5,482	5,707	26	29.96						13/10	13/10	3.90	1560.00
	12	135,000	126,000	4,051	4,217	33	29.88						13/10	13/10	3.00	1125.00
	22	157,500	171,000	5,497	5,723	29	29.88								3.30	1485.00
								13	29.31	29.97	3.69	.254			28.7	9800.50
17	13	153,000	175,500	5,696	5,930	27	29.60						15/28	15/28	1.46	620.5
	14	85,500	99,000	3,218	3,350	27	29.55						15/28	15/28	1.59	377.63
	15	108,000	162,500	3,693	3,845	29	29.26						15/34	15/34	1.53	459.00
	16	99,000	112,500	3,574	3,721	28	30.23						15/28	15/28	2.45	673.80
	17	135,000	144,000	4,616	4,808	29	29.87						15/34	15/34	2.49	933.80
	18	135,000	103,500	4,768	4,964	28	20.85						17/18	17/18	.15	56.25
	19	117,500	130,500	492	4,364	28	29.90						18/26	18/26	2.25	731.25
	20	288,000	337,500	10,820	11,264	29	29.96						18/26	18/26	2.06	1648.00
	21	193,500	207,000	6,687	6,961	29	29.74						18/26	18/26	3.48	1870.5
	23	171,000	180,000	5,814	6,053	29	29.74						18/26	18/26	3.92	1862.00
	24	243,000	265,500	8,541	8,890	28	29.87						15/34	15/34	.75	506.25
								11	28.1	28.97	.79	2.58			22.1	9738.88
18	06	139,500	157,500	5,029	5,235	28	30.10						15/34	15/34	2.12	821.5
	07	85,500	94,500	3,072	3,198	28	29.55						15/34	15/34	.68	161.5
	15	153,000	171,000	5,525	5,751	28	29.73						18/15	18/15	2.4	1020.00
	16	63,000	67,500	2,214	2,305	28	29.28						18/15	18/15	.87	152.25
	17	175,500	193,500	6,252	6,509	28	29.73						15/34	15/34	.92	448.50
	18	94,500	103,500	3,313	3,449	29	29.55						15/34	15/34	.54	338.31
	26	58,500	63,000	2,067	2,152	28	29.28						18/26	18/26	.53	87.75
	27	166,500	189,000	6,428	6,692	26	28.24						18/26	18/26	.11	50.88
	33	67,500	72,000	2,308	2,403	29	29.96						18/15	18/15	1.25	234.38
	34	85,500	90,000	2,933	3,053	29	29.98						18/15	18/15	1.20	285.00
	35	126,000	139,500	4,487	4,671	25	29.87						18/15	18/15	1.61	563.50
	36	130,500	144,000	4,582	4,770	29	30.19						18/15	18/15	.92	333.50
	41	85,500	108,000	3,418	3,558	25	30.35						18/15	18/15	1.35	320.63
								13	27.9	29.73	1.14	.53			14.5	4817.70
19	47	94,500	76,500	2,430	2,530	39	30.24						20/48	20/48	.80	210.00
	49	108,000	117,000	3,797	3,953	28	29.60						18/26	18/26	2.39	717.00
	50	189,000	207,000	6,692	6,966	28	29.72						20/48	20/48	.74	388.5
	54	301,500	337,500	10,873	11,319	28	29.82						20/48	20/48	1.16	971.50
	55	216,000	247,500	7,992	8,320	27	29.75						19/54	19/54	2.18	1308.50
	56	243,000	279,000	8,915	9,281	27	30.10						19/54	19/54	1.23	843.75
	57	274,500	292,500	9,410	9,796	29	29.86						19/57	19/57	0.08	61.00
	58	198,000	225,000	7,186	7,481	28	30.10						19/58	19/58	0.07	38.50
								8	29.3	29.9	3.73	.21			8.65	4538.30

2	09	126,000	166,500	5,228	5,443	24	30.59						2/09	2/09	0.85	28.00
	10	126,000	144,000	4,310	4,487	29	32.10						2/09	2/09	.66	231.00
	11	126,000	130,500	4,235	4,409	30	29.60						2/11	2/11	.98	343.00
	12	85,500	94,500	3,082	3,208	28	29.46						1/07	1/07	1.05	249.38
	13	157,500	157,500	5,113	3,846	31	29.59						2/11	2/11	1.29	564.38
	14	117,000	112,500	3,694	3,846	32	29.25						2/11	2/11	1.13	367.25
	15	175,500	184,500	5,596	5,826	49	31.67						2/09	2/09	1.08	526.50
	16	180,000	121,500	3,710	3,826	31	31.46						2/09	2/09	2.58	1290.00
	17	94,500	108,000	3,200	3,330	30	32.43						2/09	2/09	2.85	748.13
								9	31.6	30.68	6.56	1.2			2.33	4347.60
11	01	121,500	139,500	4,450	4,632	27	30.12						11/15	11/15	2.33	786.38
	02	198,000	216,000	6,968	7,254	28	29.78						11/02	11/02	1.13	621.50
	03	76,500	81,000	2,567	2,672	30	30.31						11/02	11/02	2.00	425.00
	04	135,000	148,500	4,792	4,988	28	29.77						11/04	11/04	.30	112.50
	05	135,000	108,000	3,494	3,637	39	29.69						11/05	11/05	.68	243.75
	08	99,000	112,500	3,607	3,754	27	29.97						11/15	11/15	1.08	290.00
	09	81,000	94,500	2,980	3,102	27	30.46						11/15	11/15	1.08	243.00
	10	99,000	112,500	3,464	3,606	29	31.20						11/15	11/15	.57	156.75
	13	85,500	94,500	2,533	2,637	34	35.84						11/15	11/15	.68	153.00
	14	121,500	139,500	4,558	4,745	27	29.40						11/15	11/15	.30	101.25
	15	72,000	72,000	2,291	2,385	31	30.19						1/04	1/04	1.97	394.00
	16	90,000	94,500	3,086	3,212	29	29.42						1/04	1/04	1.80	450.00
	17	292,500	432,000	13,859	14,426	21	29.95						1/04	1/04	2.37	1925.63
	19	135,000	144,000	4,693	4,885	29	29.48						1/04	1/04	3.56	1335.00
	23	276,930	306,000	9,811	10,273		29.79						11/23	11/23	.08	62.00
								15	28.9	30.36	3.8	1.53			19.93	7306.80
12	06	135,000	103,500	3,279	3,414	41	30.32						12/06	12/06	.15	56.25
	07	274,500	288,000	9,246	9,625	30	29.92						13/08	13/08	3.08	2348.50
	11	229,500	238,500	7,741	8,059	30	29.59						13/08	13/08	2.63	1676.63
	12	216,000	225,000	7,262	7,560	30	29.76						13/08	13/08	3.50	2100.00
	18	135,000	157,500	5,119	5,329	26	29.56						13/10	13/10	1.40	525.00
	19	72,000	85,500	2,714	2,825	27	29.69						13/10	13/10	1.70	340.00
	20	76,500	85,500	2,767	2,880	28	29.69						13/10	13/10	1.38	293.35
	21	157,500	180,000	5,773	6,010	27	29.95						13/10	13/10	2.00	875.00
	22	103,500	85,500	2,757	2,870	38	29.79						12/22	12/22	0.05	14.375
								9	30.8	29.81	4.9	.22			15.89	8229.00
13	01	135,000	135,000	4,155	4,325	32	31.21						2/07	2/09	1.67	626.25
	02	153,000	153,000	4,738	4,932	32	31.02						2/09	2/09	2.46	1045.50
	03	265,500	328,500	10,550	10,983	25	29.41						14/07	14/07	.78	575.25
	05	157,500	207,000	6,721	6,997	23	29.58						13/10	13/10	1.98	866.25
	06	166,500	202,500	6,565	6,834	25	29.63						13/10	13/10	.75	346.88
	08	148,500	220,500	7,090	7,382	21	29.87						13/10	13/10	.90	371.25
	09	94,500	108,000	3,456	3,598	27	30.02						13/10	13/10	.68	178.5
	10	99,000	108,000	3,496	3,639	28	29.68						13/10	13/10	.27	74.25
	11	103,500	112,500	3,560	3,706	29	30.36						13/10	13/10	.38	109.25
	15	126,000	148,500	4,779	4,976	26	29.84						13/10	13/10	1.31	458.5
	16	90,000	108,000	3,420	3,560	26	30.34						13/10	13/10	.75	187.5
								11	26.7	30.13	3.3	.52			11.93	4838.38

14	07	184,500	153,000	6,398	6,660	29	22.97						2/09	13/09	1.44	738.00
	12	202,500	238,500	7,750	6,068	26	39.30						2/09	13/10	1.91	1074.375
	13	121,500	148,500	4,610	4,799	26	30.94						14/07	2/09	.50	168.75
	14	135,000	139,500	4,548	4,735	30	29.46						14/14	14/14	.05	18.75
	17	171,000	180,000	5,578	5,807	31	30.99						2/09	2/09	2.45	1194.38
	18	202,500	243,000	7,772	8,091	26	30.03						14/07	14/07	1.3	753.75
	21	288,540	216,000	6,887	7,170	42	30.13						14/24	14/24	.86	462.25
	22	225,000	225,000	7,319	7,619	31	29.53						14/22	14/22	.08	50.00
	24	161,370	161,378	3,947	4,109	41	29.57						14/24	14/24	.15	45.00
	25	153,000	153,000	4,867	5,067	31	30.20						14/24	14/24	.75	243.75
								10	31.3	30.31	5.5	3.71			9.53	4749.00
1	01	189,000	211,500	6,874	7,156	27	29.56						1/01	1/01	.50	262.50
	03	162,000	166,500	5,315	5,533	30	30.10						9/10	9/19	1.46	657.00
	04	225,000	247,500	7,939	8,265	28	29.95						9/10	9/10	2.0	1250.00
	05	135,000	130,000	4,208	4,380	32	29.80						1/05	1/05	.20	75.00
	06	157,500	180,000	5,765	6,002	27	29.99						1/07	2/11	.65	284.38
	07	292,500	337,500	10,873	11,319	27	29.82						1/07	1/07	.45	365.63
	08	220,500	243,000	7,840	8,162	28	29.77						1/08	1/08	.35	214.38
								7	28.4	29.86	1.8	.163			5.61	3108.88
7	17	148,500	157,500	5,037	5,244	29	30.03						7/27	7/27	.79	325.88
	18	76,500	76,500	2,531	2,635	30	29.03						7/27	7/27	1.08	229.5
	19	153,000	171,000	5,500	5,726	28	29.86						5/05	5/05	1.50	637.50
	20	135,000	148,500	4,716	4,909	29	30.25						5/05	5/05	1.38	517.50
	21	153,000	162,000	5,282	5,499	29	29.46						7/32	5/06	1.16	493.00
	26	99,000	117,000	3,797	3,953	26	29.60						7/32	5/06	1.53	420.75
	27	180,000	166,500	5,394	5,615	33	29.65						7/27	7/27	.38	190.00
	28	148,500	180,000	5,595	5,824	27	30.91						7/32	7/32	.75	309.38
	29	162,000	153,000	4,873	5,073	33	30.16						5/06	5/06	.68	306.00
	30	171,000	184,500	5,933	6,176	29	29.87						5/06	5/06	1.02	484.5
	31	225,000	261,000	8,351	8,694	27	30.02						7/31	7/31	.12	75.00
	32	279,000	315,000	10,133	10,549	28	29.86						5/06	5/06	.3	232.50
	33	225,000	252,000	8,112	8,445	28	29.84						5/06	5/06	.75	468.75
	34	153,000	216,000	6,823	7,103	22	30.41						5/08	7/32	.32	136.00
								14	28	29.93	2.6	.431			11.76	4826.25
8	01	103,500	144,000	3.216	3,348	32	43.01						9/10	9/19	4.85	1394.38
	02	252,000	234,000	7,599	7,911	33	29.58						9/10	9/19	5.93	4151.00
	03	112,500	85,500	2,794	2,909	40	29.39						9/10	9/19	2.47	928.13
	05	135,000	144,000	4,603	4,792	28	30.05						9/10	9/19	.96	360.00
	06	139,500	153,000	4,882	5,082	29	30.11						1/08	1/08	3.95	1530.63
	10	117,000	126,000	4,085	4,253	29	29.63						1/08	9/19	3.3	1072.5
	11	108,000	153,000	4,857	5,056	22	30.28						9/08	9/08	2.1	630.00
	13	144,000	171,000	5,526	5,753	26	29.73						8/13	8/13	.06	24.00
	14	121,500	126,000	4,095	4,263	30	29.56						9/10	9/19	2.03	685.13
	15	99,000	99,000	3,198	3,329	31	29.74						9/08	1/08	1.13	310.75
	22	58,500	63,000	2,057	2,141	22	29.43						9/08	9/08	2.34	380.25
	23	176,500	90,000	2,798	2,912	27	30.91						9/08	9/19	2.35	499.38
	24	103,500	108,000	3,581	3,727	29	28.98						9/08	9/08	1.88	540.50
	25	103,500	85,500	2,774	2,888	37	29.61						9/10	9/19	.90	258.75
	35	225,000	220,500	7,060	7,350	32	30.00						8/35	8/35	.35	218.75
								15	30.3	30.67	4.2	3.33			35.1	12984.13

9	06	144,000	112,500	3,651	3,801	39	29.60						9/10	9/19	.9	360.00
	07	234,000	252,000	8,099	8,431	29	29.89						9/07	9/07	.11	71.50
	08	139,500	148,500	4,807	5,004	29	29.68						1/8	1/08	.48	186.00
	09	112,500	99,000	3,180	3,311	35	29.90						9/10	9/19	1.02	318.75
	10	94,500	117,000	3,698	3,850	26	30.30						9/10	9/19	.53	139.13
	11	166,500	198,000	6,378	6,640		30.09						9/11	9/19	.35	245.13
	12	144,000	166,500	5,320	5,538	27	30.10						9/11	9/12	.45	180.00
	20	184,500	198,000	6,321	6,580	29	30.10						9/20	9/20	.11	56.375
	21	157,500	148,500	4,714	4,907	33	30.26						1/04	9/19	1.69	739.375
								9	30.00	4.2	.243				5.64	2296.25
10	01	189,000	198,000	6,370	6,631	30	29.86						9/10	9/19	2.93	1538.25
	02	166,500	144,000	4,579	4,767	36	29.86						9/10	9/19	2.55	1179.38
	03	135,000	112,500	3,650	3,800	37	29.64						10/03	10/03	.83	311.25
	04	126,000	139,500	4,500	4,685	28	29.78						9/11	9/19	.90	315.00
	05	148,500	144,000	4,643	4,834	32	29.79						9/10	9/19	1.01	416.63
	13	180,000	184,500	5,919	6,162	30	29.94						10/13	10/13	.80	400.00
	14	103,500	117,000	3,785	3,940	27	29.70						9/10	9/19	3.18	914.25
	15	162,000	171,000	5,563	5,790	29	29.53						9/11	9/11	2.19	985.50
	16	229,500	216,000	6,918	7,202	33	29.99						10/16	10/16	.06	38.25
	17	108,000	117,000	3,724	3,877	29	30.18						9/20	9/11	1.50	450.00
	18	144,000	157,500	4,855	5,054	30	31.16						9/20	9/11	1.07	428.00
	22	270,000	288,000	9,330	9,713	29	29.65						9/10	10/22	2.45	1837.50
								12	30.8	29.95	2.97	.418			19.45	6814.00
								284	29.97	29.90	4.82	1.66		$\bar{X}$ = 1.39 km		164,631.2
														SD=1.13		
Total	25	284	43.6 million kg											N = 285		
														Length= 396.27 km		

* 25/284 = Number 25 represents Kefetegna and that of 284 represents Kebele.

APPENDIX III

DAILY CAPACITY OF EFC FLOUR PLANTS

S.No	Name of Plants/ According to Product	Year of Establishment (E.C)	Geographical Location	Theoretical Capacity			Attainable Capacity		
				Input	Output	Extraction rate	Input	Output	Extraction rate
1	Ada Flour Factory	1961	Debre Zeit	1700	1326	79	1700	1326	78
2	Yerer " "	1964	Nazreth	650	455	70	715	557.7	78
3	Anbessa " "	1939	Addis Ababa	650	488	75	650	494	76
4	Red Sea " "	1. 1945*	Asmara	200	146	73	200	156	78
		2. 1955		100	78	78	100	78	78
5	Dekemehari Flour Factory	1948	Dekemehari	300	219	73	327	255.1	78
6	Nazreth Flour factory	1951	Nazreth	450	351	78	520	505.6	78
7	Adwa " "	1959	Addis Ababa	500	380	76	600	468	78
8	Misrak " "	1948	Addis Ababa	400	312	78	484	377.5	78
9	Kaliti " "	1960	Addis Ababa	450	342	76	450	342	76
10	Diredawa " "	1934	Dire Dawa	400	308	77	300	231	77
11	Hamaressa " "	1948	Hamaressa	200	150	75	240	182.4	76
12	Faffa.....	---	Addis Ababa	300	255	85	300	255	85
13	Tigray Flour Mill	1950	Mekele	250	190	76	210	159.6	76
14	Asmara " "	1979	Asmara	1300	1014	78	1300	1014	78
15	Kokeb " "	1979	Addis Ababa	1200	936	78	1200	936	78
16	Awasa " "	1979	Awasa	1200	936	78	1200	936	78
17	Debrezeit Maize Mill	1973	Debrezeit	1100	880	80	1100	880	80
	Total	---	---	11350	8766	---	11596	9053.9	--

Source: Ethiopian Food Corporation, 1988/89, A.A.

* Stopped due to technical obsolecence.

APPENDIX IV

THE LOCATION OF BREAD PRODUCTION AND CAPACITY, KEFETEGNA LEVEL

Kefetegna	Production Capacity In Kg/day (Estimated 1987/88)				Current Production and Capacity Kg/day				Utilization ratio in Percent (Estimated)
	Government	Public	Private	Total	Government	Public	Private	Total	
4		3040.00	6801.25	9841.25		1982.50	4528.00	6510.50	66.20
5		7328.75	40938.75	48267.50		2995.00	22325.00	25320.00	52.50
6		3040.00	9600.00	12640.00		1732.50	5306.25	7038.75	55.70
24		7165.00	4912.50	12077.50		5070.00	2056.25	7126.25	59.00
25		4915.00	5838.75	10753.75		2207.50	2891.25	5098.75	47.40
3			20863.75	20863.75			7016.25	7016.25	33.60
20		2040.00	4826.25	6866.25		857.50	2637.50	3495.00	50.90
21	22500.00		6938.75	29438.75	22500.00		3858.75	26358.75	89.50
22			2401.25	2401.25			1912.50	1912.50	79.60
23		15290.00	2985.00	18275.00		10607.50	1291.25	11898.75	65.10
15			10451.25	10451.25			6496.25	6496.25	62.20
16		2790.00	276.25	3066.25		1607.50	300.00	1907.50	62.20
17	8750.00		3901.25	12651.25	8750.00		3175.00	11925.00	94.30
18	7500.00		10101.25	17601.25	7500.00		6512.50	14012.50	79.60
19		2790.00	7901.25	10691.25		1482.50	3996.25	5478.75	51.20
2	7500.00		19376.25	26876.25			10503.75	18003.75	67.00
11		3038.75	3863.75	6902.50		2057.50	2783.75	4841.25	70.10
12		3788.75		3788.75		982.50		982.50	25.90
13		13538.75	7226.25	20765.00		10232.50	4200.00	14432.50	69.50
14		3288.75	3960.00	7248.75		1232.50	1933.75	3166.25	43.70
1		2038.75	17055.00	19093.75		1107.50	6178.75	7286.25	38.20
7		1788.75	7163.75	8952.50		857.50	4178.75	5036.25	56.30
8		2038.75	3176.25	5215.50		1232.50	2400.00	3632.50	69.60
9		18163.75	9010.00	27173.75		12045.00	3741.25	15796.25	58.10
10		33038.75	151.25	3190.00		1735.00	450.00	2185.00	68.50
Total 25	46250.00	99125.00	209720.00	355095.00	46250.00	60025.00	110673.00	216948.00	
	13%	28%	59%	100%	21%	28%	51%	100%	

APPENDIX V

NEAREST NEIGHBOUR INDEX AND Z-SCORE VALUES FOR BAKARIES IN ADDIS ABABA, KETENA AND KEFETEGNA LEVELS [1984-1988]

KETENA	KEFTE-GNA	NO. OF BAKERIES	NO.OF MEASURED PAIRS	DISTANCE IN KM. TOTAL	DISTANCE IN KM. MEAN ($\bar{X}$)	AREA IN KM	EXPECTED MEAN DISTANCE ie.	NEAREST NEIGHBOR INDEX	STANDARD ERROR OF DRAN	Z-SCORE VALUES
1	4	7	7	1.89	0.2700	2.06	0.2710	0.9954	0.053589	-0.018656*
	5	28	28	3.75	0.1339	1.62	0.1200	1.0809	0.011881	1.168067*
	6	11	11	3.02	0.2745	1.90	0.2078	1.2993	0.032751	2.033536**
	24	14	14	7.13	0.5093	27.49	0.7006	0.7279	0.097881	-1.954034*
	25	13	13	5.12	0.3938	12.01	0.4806	0.8115	0.069673	-1.245333*
	Ketena 1	73	73	19.785	0.2710	45.08	0.3929	0.6897	0.024039	-5.079166#
2	3	11	11	1.97	0.1791	2.30	0.2286	0.7873	0.036034	-1.37500*
	20	5	5	3.75	0.7500	7.21	0.6004	1.2491	0.140358	1.065521*
	21	4	4	1.47	0.3675	3.87	0.4918	0.7592	0.128539	-0.967332*
	22	2	2	1.05	0.5250	2.22	0.5268	0.9966	0.194709	-9.2449*
	23	5	5	3.32	0.6640	18.20	0.9539	0.6919	0.222999	-1.3*
	Ketena 2	27	27	11.175	0.4139	33.80	0.5594	0.7396	0.056277	-2.58529**
3	15	8	8	2.93	0.3663	3.70	0.3400	1.0881	0.062842	0.41879*
	16	4	4	3.36	0.8400	12.54	0.8853	0.9488	0.231381	-0.195765*
	17	5	5	4.97	0.9940	39.65	1.4081	0.7031	0.329148	-1.25789*
	18	4	4	1.83	0.4575	4.25	0.5154	0.8925	0.134702	-0.42984*
	19	9	9	3.44	0.3822	15.41	0.6543	0.5808	0.113998	-2.38684**
	Ketena 3	30	30	15.015	0.5005	75.55	0.7935	0.6308	0.075724	-3.87054#
4	2	8	8	2.00	0.2500	1.99	0.2494	1.0025	0.046086	0.013015*
	11	7	7	3.29	0.4700	14.67	0.7239	0.6493	0.143007	-1.77552*
	12	2	2	1.35	0.6750	14.56	1.3492	0.5040	0.498643	-1.352186*
	13	5	5	2.21	0.4420	3.69	0.4295	1.0244	0.100411	0.124502*
	14	5	5	3.41	0.6820	2.80	0.3742	1.8174	0.087468	3.52174#
	Ketena 4	27	27	10.29	0.3811	37.71	0.5909	0.6449	0.059443	-3.529438#
5	1	11	11	1.95	0.1773	1.54	0.1871	0.9624	0.029485	-0.3322*
	7	11	11	2.52	0.2290	2.05	0.2158	1.0656	0.034019	0.388238*
	8	9	9	6.87	0.7653	14.06	0.6249	1.2161	0.1088903	1.28956*
	9	8	8	2.96	0.3700	2.58	0.2617	1.3031	0.052476	2.0628**
	10	4	4	3.65	0.9125	9.67	0.7742	1.1705	0.203185	0.68061*
	Ketena 5	43	43		0.3652	29.90	0.4169	0.8759	0.033235	-1.5572*
	Total	200	200	64.035	0.3202	222.04	0.5268	0.6078	0.019473	-10.61119#

* Significant

** Significant at 95 percent level

\# Significant at 99 percent level

APPENDIX VI

ADDIS ABABA POPULATION SIZE, 1983/84 TO 1988/89

Kefet-egna	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89
4	66,598	68,536	71,420	74,350	77,403	80,575
5	78,117	80,390	83,773	87,210	90,321	94,024
6	62,772	64,599	67,317	70,079	72,954	75,046
24	63,410	65,255	68,001	70,791	73,688	76,710
25	48,653	50,069	52,176	54,317	56,551	58,870
3	71,915	74,008	77,122	80,286	83,577	87,905
20	55,731	57,353	59,766	62,218	64,768	67,259
21	75,970	78,181	81,471	84,814	88,294	91,914
22	32,858	33,814	35,237	36,683	38,188	39,754
23	59,875	61,617	64,210	66,845	69,587	72,439
15	55,335	56,945	59,341	61,776	64,309	66,874
16	52,187	53,706	55,966	58,262	60,652	63,140
17	57,459	59,131	61,619	64,147	66,776	69,513
18	48,142	49,543	51,628	53,746	55,951	58,244
19	53,426	54,981	57,295	59,646	62,096	64,641
2	35,591	36,627	38,168	39,734	42,206	43,937
11	68,208	70,193	73,147	76,148	79,206	82,154
12	43,508	44,774	46,658	48,572	50,563	52,637
13	54,578	56,166	58,530	60,932	63,429	66,030
14	55,647	57,266	59,676	62,125	64,670	67,320
1	45,518	46,843	48,814	50,817	52,900	55,068
7	76,536	78,763	82,077	85,445	88,947	92,595
8	58,863	60,576	63,125	65,715	68,614	71,428
9	43,051	44,304	46,168	48,062	50,033	52,083
10	59,525	61,258	63,836	66,455	69,179	72,021
	1,423,473	1,464,898	1,526,541	1,589,175	1,654,862	1,722,181

Sources: 1. CSO, Urban Population Number, Amharic 1986/87/September.
2. CSO, Urban Population Number, Amharic 1987/88/May

APPENDIX VII

SIZE OF BREAD QUOTA PER DAY IN KG. 1984/85 TO 1986/88

Kefetegna		1984-85	1985-86	1986-87	KG/DAY 1987-88
I	4	5,431.25	5,612.5	5,612.5	6,499
	5	3,818.75	6,400	6,400	7,553
	6	5,176.88	5,600	5,600	6,040.5
	24	4,174.38	5,475	5,475	6,221.5
	25	3,174.38	4,012.5	4,012.5	4,815.5
II	3	5,931.88	6,137.5	6,137.5	7,040.5
	20	4,119.38	4,587.5	4,587.5	5,467
	21	5,949.38	6,400	6,400	6,853
	22	2,833.75	2,700	2,700	3,376.5
	23	4,451.88	4,800	4,800	5,728
III	15	4,702.50	4,750	4,750	5,415.5
	16	3,872.00	4,550	4,550	5,153
	17	2,515.63	4,800	4,800	5,489
	18	3,382.50	3,975	3,975	4,728
	19	3,796.25	4,512.5	4,512.5	5,253
IV	2	2,730.00	3,300	3,300	3,690.5
	11	5,382.50	5,600	5,600	6,678
	12	3,569.38	3,888.5	3,888.5	4,326.6
	13	4,610.00	4,275	4,275	5,390.5
	14	4,550.63	4,875	4,875	5,355
V	1	3,723.125	3,837.5	3,837.5	4,515.5
	7	6,151.25	6,412.5	6,412.5	7,415.5
	8	4,471.25	5,275	5,275	5,865.5
	9	3,693.125	3,825	3,825	4,303
	10	4,398.125	5,450	5,450	5,828
Total		106,585.175	121,051	121,051	139,001
		26.2kg/Pcc	28.8 Pcc	27.6 Pcc	30.2 Pcc

APPENDIX VIII

NEAREST NEIGHBOUR INDEX AND Z-SCORE VALUES FOR BREAD SHOPS IN ADDIS ABABA, 1984-1988

Ketena	Kefetegna	No. of Bread Shops	No.of Measured Pairs	Distances in km. Total	Mean	Area in km	Expected Mean Distances	Nearest Neighbour Index (Rn)	Standard error of Expected Mean distance	Z-score values For (Rn)
	4	13	13	3.29	0.2531	2.06	0.1990	1.2718	0.0289	1.8720*
	5	12	12	2.99	0.2492	1.62	0.1837	1.3565	0.0277	2.3646^
1	6	12	12	2.70	0.2250	1.90	0.1990	1.1309	0.0300	0.8667*
	24	8	8	6.66	0.8325	27.49	0.9269	0.8982	0.1713	-0.5511*
	25	9	9	2.27	0.2522	12.01	0.5776	0.4366	0.1006	-3.2346#
Ketena 1		54	54	16.89	0.3128	45.08	0.4569	0.6847	0.0325	-4.4334#
	3	14	14	3.44	0.2457	2.30	0.2027	1.2123	0.0283	1.5194*
	20	13	13	3.99	0.3069	7.21	0.3724	0.8242	0.0540	-1.2130*
2	21	18	18	4.95	0.2750	3.87	0.2318	1.1862	0.2856	0.1513*
	22	6	6	2.48	0.4133	2.22	0.3041	1.3590	0.0649	1.6826*
	23	9	9	6.38	0.7089	18.20	0.7110	0.9970	0.1239	-0.0169*
Ketena 2		60	60	20.49	0.3415	33.80	0.3753	0.9099	0.0253	-1.3360*
	15	14	14	4.52	0.3228	3.70	0.2570	1.2560	0.0359	1.8329*
	16	13	13	5.79	0.4454	12.54	0.4911	0.9070	0.0712	-0.6419*
3	17	11	11	8.25	0.7500	39.65	0.9493	0.79007	0.1496	-1.3322*
	18	13	13	4.62	0.3554	4.25	0.2859	1.2432	0.0414	1.6787*
	19	8	8	5.01	0.6263	15.41	0.6940	0.9025	0.1282	-0.5281*
Ketena 3		59	59	24.81	0.4205	75.55	0.5658	0.7432	0.0385	-3.7740#
	2	9	9	3.06	0.3400	1.99	0.2351	1.4461	0.0410	2.5585^
	11	15	15	4.41	0.2940	14.67	0.4945	0.5946	0.0667	-3.0060#
4	12	9	9	4.01	0.4456	14.56	0.6359	0.7007	0.1108	-1.7175*
	13	11	11	4.91	0.4464	3.69	0.2896	1.5415	0.0456	3.4386#
	14	10	10	3.63	0.3630	2.80	0.2646	1.3720	0.0437	2.2517^
Ketena 4		54	54	19.34	0.3581	37.71	0.4178	0.8570	0.0297	-2.0101^
	1	7	7	1.44	0.2057	1.54	0.2345	0.8771	0.0463	-0.6220*
	7	14	14	4.50	0.3214	2.05	0.1913	1.6798	0.0267	4.8727#
5	8	15	15	8.00	0.5333	14.06	0.4841	1.1017	0.0653	0.7534*
	9	9	9	3.71	0.4122	2.58	0.2677	1.5397	0.0466	3.1009#
	10	12	12	4.82	0.4016	9.67	0.4488	0.8947	0.0677	-0.6972*
Ketena 5		57	57	20.19	0.3542	29.90	0.3621	0.9781	0.0251	-0.3147*
Total	25	284	284	93.12	0.3279	222.04	0.4421	0.7417	0.0137	-8.3358#

* Insignificant.

^ Significant at 95 percent level.

\# Significant at 99 percent level

APPENDIX IX

d And μ Values At Ketana Kefetegna and Addis Ababa Levels

KETENA	KEFET-EGNA	VOLUME OF BREAD IN A DAY IN KG	AGGREGATE TRANSPORTATION COST IN KM.KG.	d^1 WEIGHTED LENGTH OF HAUL IN KM	μ - Index
1	4	5612.5	5347.875	0.9529	5889.915
	5	6400.0	4707.875	0.7356	8700.381
	6	5600.0	4139.125	0.7391	7576.783
	24	5475.0	6160.25	1.1252	4865.802
	25	4012.5	5946.25	1.4819	2707.6725
	=	27100.0	26301.375	0.9705	27923.75
2	3	6137.5	8383.125	1.3659	4493.374
	20	4587.5	8503.375	1.8536	2474.914
	21	6400.0	9091.875	1.4206	4505.139
	22	2700.0	4283.125	1.5863	1702.074
	23	4800.0	9025.25	1.8803	2552.784
	=	24625.0	39286.75	1.5954	15435.00
3	15	4750.0	8647.5	1.8205	2609.173
	16	4550.0	9800.504	2.1540	2112.349
	17	4800.0	9738.875	2.0289	2365.814
	18	3975.0	4817.685	1.2120	3279.703
	19	4512.5	4538.25	1.0057	4486.925
	=	22587.5	37542.814	1.6621	13589.735
4	2	3300.0	4347.625	1.3175	2504.744
	11	5600.0	7306.75	1.3048	4291.845
	12	3888.5	8229.0	2.1162	1837.492
	13	4275.0	4838.375	1.1318	3777.169
	14	4875.0	4749.0	0.9742	5004.106
	=	21938.5	29470.75	1.3433	16331.794
5	1	3837.5	3108.875	0.8101	4737.069
	7	6412.5	4826.25	0.7526	8520.462
	8	5275.0	12984.125	2.4614	2143.089
	9	3825.0	2296.25	0.6003	6371.814
	10	5450.0	8814.00	1.6172	3370.023
	=	24800.0	32029.5	1.2915	19202.477
ADDIS ABABA TOTAL		121051.0	164631.189	1.360015	89008.088

APPENDIX X

Coefficient Of Geographic Association (Cg) Between Total Population and Bread Quota, Kefetegna Level/ 1986.

Kefetegna	Population (X)	Bread Quota (KG) (Y) Day	Proportions $\frac{X_i}{X_T}$	Proportions $\frac{Y_i}{Y_T}$	$\frac{X_i}{X_T} - \frac{Y_i}{Y_T}$
4	65,809.00	5,612.50	0.0466	0.0460	+0.0006
5	75,386.00	6,400.00	0.0534	0.05248	0.0009
6	65,698.00	5,600.00	0.04655	0.04592	.0007
24	64,436.00	5,475.00	0.04566	0.04490	.0008
25	46,183.00	4,012.50	0.03273	0.03290	-.0002
3	70,634.00	6,137.50	0.05005	0.050328	-.002
20	56,262.00	4,587.50	0.03987	0.03762	0.0023
21	76,377.00	6,400.00	0.054121	0.05280	0.0013
22	32,127.00	2,700.00	0.02277	0.02214	0.0007
23	59,254.00	4,800.00	0.04199	0.03936	0.0026
15	56,918.00	4,750.00	0.04033	0.03895	0.0013
16	53,485.00	4,550.00	0.03789	0.03731	0.0006
17	57,284.00	4,800.00	0.04059	0.03936	0.0012
18	47,274.00	3,975.00	0.03350	0.03259	0.0009
19	54,223.00	4,512.50	0.03842	0.037003	0.0014
2	35,772.00	3,300.00	0.02535	0.02706	-0.0017
11	65,687.00	5,600.00	0.04655	0.04592	0.0007
12	43,312.00	3,888.50	0.03069	0.03189	-0.0012
13	50,734.00	4,275.00	0.03595	0.03506	0.0009
14	52,465.00	4,875.00	0.03718	0.03998	-0.0028
1	45,110.00	3,837.50	0.03197	0.03147	0.0005
7	73,308.00	6,412.50	0.05195	0.05258	-0.0006
8	60,857.00	5,275.00	0.04312	0.04326	-0.0002
9	45,615.00	3,825.00	0.03232	0.03137	0.0009
10	57,008.00	5,450.00	0.0404	0.04469	-0.0043
Tota	1,411,218.00	121,951.00	1	1	-0.0012 +0.0183 0.0071

$$Cg = \frac{\sum_{i=1}^{K} \left(\frac{X_i}{X_T} - \frac{Y_i}{Y_T} \right)}{2} = \frac{.0071}{2} = 0.0036$$

= 0.0071

APPENDIX XI

Coefficient Of Geographic Association (Cg) Between Total Population And Bread Quota/Keftegna Level/1988

Keftegn	Total Population	Bread Quota Kg/Day	Proportions		$\frac{X_i}{X_T} - \frac{Y_i}{Y_T}$
			Population	Quota	
4	74,350.00	6,499.00	0.0466	0.0468	-0.0002
5	87,210.00	7,553.00	0.0547	0.0543	+0.0004
6	70,080.00	6,040.50	0.0440	0.0445	+0.0005
24	70,794.00	6,221.50	0.0444	0.0448	-0.0004
25	54,317.00	4,815.50	0.0341	0.0346	-0.0005
3	80,287.00	7,040.50	0.0504	0.0507	-0.0003
20	61,911.00	5,467.00	0.0389	0.0393	-0.0004
21	86,814.00	6,853.00	0.0544	0.04930	+0.0051
22	36,679.00	3,376.50	0.0230	0.0243	-0.0013
23	66,845.00	5,728.00	0.0419	0.0412	+0.0007
15	67,381.00	5,415.50	0.0423	0.0390	+0.0033
16	58,260.00	5,153.00	0.0365	0.0371	-0.0006
17	64,150.00	5,489.00	0.0402	0.0395	+0.0007
18	53,746.00	4,728.00	0.0337	0.0340	-0.0003
19	59,646.00	5,253.00	0.0374	0.0378	-0.0004
2	39,734.00	3,690.50	0.0249	0.0266	-0.0017
11	76,208.00	6,678.00	0.0478	0.0480	-0.0002
12	48,572.00	4,326.60	0.0305	0.0311	-0.0006
13	60,932.00	5,390.50	0.0382	0.0385	-0.0003
14	60,125.00	5,355.00	0.0377	0.0385	-0.0008
1	50,817.00	4,515.50	0.0319	0.0325	-0.0006
7	85,445.00	7,415.50	0.0536	0.0533	+0.0003
8	65,714.00	5,865.50	0.0412	0.0422	-0.001
9	48,062.00	4,303.00	0.0301	0.0310	-0.0009
10	66,455.00	5,828.00	0.0417	0.0419	-0.0002
Tota	1,594,534.00	139,001.0	1	1	+0.0003

Coefficient Of Geographic Association (Cg) = $\frac{0.0003}{2}$ = 0.00015

$$Cg = \frac{\sum_{n=1}^{K} \frac{X_i}{X_T} - \frac{Y_i}{Y_T}}{2}$$

APPENDIX XII

Cumulative Proportions For Population /%/ And Bread Quota in % in 1986 and 1988 at Kefetegna Level

Kefete gna	Cumulative Proportions		1988	
	Population (X%) 1986	Bread Quota (Y%) 1986	X%	Y%
4	4.66	4.60	4.66	4.68
5	10.00	9.86	10.13	10.11
6	14.66	14.44	14.53	14.46
24	19.23	18.93	18.97	18.94
25	22.50	22.23	22.38	22.40
3	27.50	27.25	27.42	27.47
20	31.49	31.01	31.31	31.40
21	36.90	36.29	36.75	36.33
22	39.18	38.51	39.05	38.76
23	43.38	42.44	43.24	42.88
15	47.41	46.34	47.47	46.78
16	51.20	50.07	51.12	50.49
17	55.26	54.02	55.14	54.44
18	58.61	57.28	58.51	57.84
19	62.45	60.97	62.25	61.62
2	64.99	63.68	64.74	64.28
11	69.65	68.28	69.52	69.08
12	72.72	71.46	72.57	72.19
13	76.32	74.98	76.39	76.04
14	80.04	78.96	80.16	79.89
1	83.24	82.12	83.35	83.14
7	88.44	87.38	88.71	88.47
8	92.75	91.71	92.83	92.69
9	95.98	94.85	95.84	95.79
10	100.001	100.00	100.01	100.00
Total		1327.66	1421.29	1417.39

Source: Table 14 and 15 Calculation Added.

APPENDIX XIII PART 1

GINI CONCENTRATION RATIO FOR TOTAL POPULATION AND

BREAD QUOTA , KEFETEGNA LEVEL, 1985/86

KEFETEGNA	TOTAL POPULATION	BREAD QUOTA	PROPORTION OF		CUMULATIVE PROPORTION OF		X Y+1	Y X+1
	X	Y	Xi	Yi	X	Y		
21	76,377.000	6,400.000	0.054	0.053	0.054	0.053	0.006	0.006
5	75,386.000	6,400.000	0.053	0.053	0.108	0.106	0.017	0.017
7	73,308.000	6,412.500	0.052	0.053	0.160	0.159	0.033	0.033
3	70,634.000	6,137.500	0.050	0.051	0.210	0.210	0.054	0.054
4	65,809.000	5,612.500	0.046	0.046	0.250	0.260	0.078	0.078
6	65,698.000	5,600.000	0.047	0.046	0.300	0.302	0.106	0.106
11	65,687.000	5,600.000	0.047	0.046	0.350	0.340	0.138	0.138
24	64,436.000	5,475.000	0.046	0.045	0.395	0.390	0.173	0.173
8	60,859.000	5,275.000	0.043	0.044	0.438	0.437	0.210	0.211
23	59,254.000	4,800.000	0.042	0.040	0.480	0.477	0.248	0.249
17	57,284.000	4,800.000	0.041	0.040	0.521	0.517	0.293	0.290
10	57,008.000	5,450.000	0.040	0.045	0.561	0.562	0.337	0.338
15	56,918.000	4,750.000	0.040	0.039	0.602	0.601	0.384	0.386
20	56,262.000	4,587.500	0.040	0.038	0.642	0.639	0.434	0.434
19	54,223.000	4,512.500	0.038	0.037	0.680	0.676	0.486	0.486
16	53,485.000	4,550.000	0.038	0.038	0.718	0.714	0.541	0.539
14	52,465.000	4,875.000	0.037	0.040	0.755	0.754	0.596	0.597
13	50,734.000	4,275.000	0.036	0.035	0.791	0.790	0.681	0.651
18	47,274.000	3,975.000	0.034	0.033	0.825	0.822	0.705	0.705
25	46,183.000	4,012.500	0.033	0.033	0.857	0.856	0.760	0.761
9	45,615.000	3,825.000	0.032	0.032	0.890	0.887	0.817	0.817
1	45,110.000	3,837.500	0.032	0.032	0.921	0.919	0.875	0.875
12	43,312.000	3,888.500	0.031	0.032	0.952	0.950	0.931	0.929
2	35,772.000	3,300.000	0.025	0.027	0.978	0.980	0.978	0.978
22	32,127.000	2,700.000	0.023	0.022	1.000	1.000	0.000	0.000
TOTAL	1,411,220.000	121,051.000	1.000	1.000	14.438	14.401	9.881	9.851

Gini Concentration ratio difference of sums of the last two columns = 0.033

APPENDIX XIII PART 2

GINI CONCENTRATION RATIO FOR TOTAL POPULATION AND

BREAD QUOTA , KEFETEGNA LEVEL, 1987/88

KEFETEGNA	TOTAL POPULATION	BREAD QUOTA	PROPORTION OF		CUMULATIVE PROPORTION OF		X Y+1	Y X+1
	X	Y	Xi	Yi	X	Y		
5	87,210.000	7,553.000	0.055	0.054	0.055	0.054	0.007	0.006
21	86,814.000	6,853.000	0.054	0.049	0.109	0.104	0.017	0.017
7	85,445.000	7,415.500	0.054	0.053	0.163	0.157	0.034	0.033
3	80,287.000	7,040.500	0.050	0.051	0.213	0.208	0.055	0.054
11	76,208.000	6,678.000	0.048	0.048	0.261	0.256	0.079	0.079
4	74,350.000	6,499.000	0.047	0.047	0.308	0.302	0.107	0.106
24	70,794.000	6,221.500	0.044	0.045	0.352	0.347	0.138	0.138
6	70,080.000	6,040.500	0.044	0.044	0.396	0.391	0.170	0.171
15	67,381.000	5,415.500	0.042	0.039	0.438	0.430	0.206	0.206
23	66,845.000	5,728.000	0.042	0.042	0.480	0.471	0.246	0.246
10	66,455.000	5,828.000	0.042	0.042	0.522	0.513	0.290	0.289
8	65,714.000	5,865.500	0.041	0.042	0.563	0.555	0.340	0.335
17	64,150.000	5,489.000	0.040	0.040	0.603	0.595	0.382	0.382
20	61,911.000	5,467.000	0.039	0.039	0.642	0.634	0.432	0.431
13	60,932.000	5,390.500	0.038	0.039	0.680	0.673	0.484	0.483
14	60,125.000	5,355.000	0.038	0.039	0.718	0.711	0.538	0.537
19	59,646.000	5,253.000	0.037	0.038	0.755	0.749	0.594	0.593
16	58,260.000	5,153.000	0.037	0.037	0.792	0.786	0.651	0.649
25	54,317.000	4,815.500	0.034	0.035	0.826	0.821	0.706	0.705
18	53,746.000	4,728.000	0.034	0.034	0.860	0.855	0.763	0.762
1	50,817.000	4,515.500	0.032	0.033	0.892	0.887	0.819	0.818
12	48,572.000	4,326.600	0.030	0.031	0.922	0.918	0.875	0.874
9	48,062.000	4,303.000	0.030	0.031	0.952	0.949	0.929	0.927
2	39,734.000	3,690.500	0.025	0.027	0.977	0.976	0.977	0.976
22	36,679.000	3,376.500	0.023	0.024	1.000	1.000	0.000	0.000
TOTAL	1,594,534.000	139,001.100	1.000	1.000	14.479	14.342	9.828	9.817

Gini Concentration ratio differences of sums of the last two columns = 0.011

APPENDIX IV

THE LOCATION OF BREAD PRODUCTION AND CAPACITY, KEFETEGNA LEVEL

Kefet-gna	Production Capacity In Kg/day (Estimated 1987/88)				Current Production and Capacity Kg/day				Utilization ratio in Percent (Estimated)
	Govern-ment	Public	Private	Total	Govern-ment	Public	Private	Total	
4		3040.00	6801.25	9841.25		1982.50	4528.00	6510.50	66.20
5		7328.75	40938.75	48267.50		2995.00	22325.00	25320.00	52.50
6		3040.00	9600.00	12640.00		1732.50	5306.25	7038.75	55.70
24		7165.00	4912.50	12077.50		5070.00	2056.25	7126.25	59.00
25		4915.00	5838.75	10753.75		2207.50	2891.25	5098.75	47.40
3			20863.75	20863.75			7016.25	7016.25	33.60
20		2040.00	4826.25	6866.25		857.50	2637.50	3495.00	50.90
21	22500.00		6938.75	29438.75	22500.00		3858.75	26358.75	89.50
22			2401.25	2401.25			1912.50	1912.50	79.60
23		15290.00	2985.00	18275.00		10607.50	1291.25	11898.75	65.10
15			10451.25	10451.25			6496.25	6496.25	62.20
16		2790.00	276.25	3066.25		1607.50	300.00	1907.50	62.20
17	8750.00		3901.25	12651.25	8750.00		3175.00	11925.00	94.30
18	7500.00		10101.25	17601.25	7500.00		6512.50	14012.50	79.60
19		2790.00	7901.25	10691.25		1482.50	3996.25	5478.75	51.20
2	7500.00		19376.25	26876.25			10503.75	18003.75	67.00
11		3038.75	3863.75	6902.50		2057.50	2783.75	4841.25	70.10
12		3788.75		3788.75		982.50		982.50	25.90
13		13538.75	7226.25	20765.00		10232.50	4200.00	14432.50	69.50
14		3288.75	3960.00	7248.75		1232.50	1933.75	3166.25	43.70
1		2038.75	17055.00	19093.75		1107.50	6178.75	7286.25	38.20
7		1788.75	7163.75	8952.50		857.50	4178.75	5036.25	56.30
8		2038.75	3176.25	5215.50		1232.50	2400.00	3632.50	69.60
9		18163.75	9010.00	27173.75		12045.00	3741.25	15796.25	58.10
10		33038.75	151.25	3190.00		1735.00	450.00	2185.00	68.50
Total 25	46250.00	99125.00	209720.00	355095.00	46250.00	60025.00	110673.00	216948.00	
	13%	28%	59%	100%	21%	28%	51%	100%	

APPENDIX XIV

PCC Of Bread Weighing 125,100,62.5 Grams Of Bread,
Kefetegna level, for Addis Ababa (1986 Quota), Per Day
Bread Equivalent & PCC in Pieces

Ketana	Kefet-egna	Population	125 grams No.	125 grams PCC in Pieces/Day	125 grams No.	125 grams PCC in Pieces/Day	62.5 grams No.	62.5 grams PCC in Pieces/Day
	4	65,809.00	44,900.00	0.68	56,125.00	0.85	89,800.00	1.40
	5	75,386.00	51,200.00	0.68	64,000.00	0.85	102,400.00	1.36
1	6	65,698.00	44,800.00	0.68	56,000.00	0.85	89,600.00	1.36
	24	64,436.00	43,800.00	0.68	54,750.00	0.85	87,600.00	1.36
	25	46,183.00	32,100.00	0.70	40,125.00	0.87	64,200.00	1.39
		317,512.00	224,000.00	0.71	280,000.00	0.88	448,000.00	1.41
	3	70,634.00	49,100.00	0.70	61,375.00	0.87	98,200.00	1.39
	20	56,262.00	36,700.00	0.65	45,875.00	0.82	73,400.00	1.30
2	21	76,377.00	51,200.00	0.67	64,000.00	0.84	102,400.00	1.34
	22	32,127.00	21,600.00	0.67	27,000.00	0.84	43,200.00	1.34
	23	59,254.00	38,400.00	0.65	48,000.00	0.81	76,800.00	1.30
		294,654.00	197,000.00	0.67	346,250.00	0.84	394,000.00	1.34
	15	56,918.00	38,000.00	0.67	47,500.00	0.83	76,000.00	1.34
	16	53,485.00	36,500.00	0.68	45,500.00	0.85	72,800.00	1.36
3	17	57,284.00	38,400.00	0.67	48,000.00	0.84	76,800.00	1.34
	18	47,274.00	31,800.00	0.67	39,750.00	0.84	63,600.00	1.35
	19	54,223.00	36,100.00	0.67	45,125.00	0.83	72,200.00	1.33
		269,184.00	180,700.00	0.67	225,875.00	0.84	361,400.00	1.34
	2	35,772.00	26,400.00	0.74	33,000.00	0.92	52,800.00	1.48
	11	65,687.00	44,800.00	0.68	56,000.00	0.85	89,600.00	1.36
4	12	43,312.00	31,108.00	0.72	38,885.00	0.90	62,216.00	1.44
	13	50,734.00	34,200.00	0.67	42,750.00	0.84	68,400.00	1.35
	14	52,465.00	39,000.00	0.74	48,750.00	0.93	78,000.00	1.49
		247,970.00	175,508.00	0.71	219,385.00	0.89	351,016.00	1.42
	1	45,110.00	30,700.00	0.68	38,375.00	0.85	61,400.00	1.36
	7	73,308.00	51,300.00	0.70	64,125.00	0.87	102,600.00	1.40
5	8	60,857.00	42,200.00	0.69	52,750.00	0.87	84,400.00	1.39
	9	45,615.00	30,600.00	0.67	38,250.00	0.84	61,200.00	1.34
	10	57,008.00	43,600.00	0.76	54,500.00	0.96	87,200.00	1.53
		281,898.00	198,400.00	0.70	248,000.00	0.88	396,800.00	1.41
Total		1,411,218.00	975,608.00	0.69	1,219,510.00	0.86	1,951,216.00	1.38

Source: Ethiopian Food Corporation 1987/88, Calculation Added.

APPENDIX XVI

PCC Of Bread Weighing 125,100,62.5 grams Of Bread, Bread Market Zones Level (1986 Quota), Per Day

Zones	Population	Bread Equivalent & PCC in pieces					
		125 grams		100 grams		62.5 grams	
		No.	PCC	No.	PCC	No.	PCC
Private Bread Market Zone	838894	604880	0.72	756100	0.90	1209760	1.44
Kebele-Church Bread Market Zone	306748	195120	0.64	243900	0.80	390240	1.30
Public Bread Market Zone (Municipality Bakeries)	265576	175608	0.66	219510	0.83	351216	1.32
Total A.A.	1411218	975608	0.69	1219510	0.86	1951216	1.38

APPENDIX XVII

PCC Of Bread Weighing 125,100,62.5 grams Of Bread, Addis Ababa Level, Using The Attainable Capacity And Current Production Data/Day

Bread Production	125 grams bread		100 grams bread		62.5 grams bread	
	No	PCC in Pieces	No	PCC in Pieces	No	PCC in Pieces
Current Production Per Day	1735584	1.23	2169948	1.54	3471168	2.46
Attainable Capacity Per Day	2840696	2.03	3550870	2.52	5681392	4.06

Source: Ethiopian Food Corporation, 1987/88. Calculation is Added.

APPENDIX XVIII

A Recipe And Procedure For Wheat-Maize Flour Bread

A recipe and procedure for the production of pound loaves from 75 per cent wheat flour plus 25 per cent maize flour are given below. The dough is made from 50 kg flour and yields 150 loaves of 1 lb (454 grams). For the baking, an oven with a surface of approximately 5m² is required.

Recipe

	Parts (% flour weight)
Wheat Flour[1]	75
Maize Flour	25
Water	58
Salt	1.5
Yeast (instant)	1
Sugar	3
Fat (or Margarine)	2
Emulsifier	0.2

1) Minimum protein content (N x 5.7) 11% moisture basis; ash value maximum 0.6%.

Procedure

Mixing in a spiral mixer	10 min
Bulk fermentation with knock back	50 "
Scaling in pieces and rounding	
Intermediate proof	30 min
Moulding and panning; final proof	35 "
Baking	35 "

Source: UNECA, 1985, Technical Compendium On Composite Flours, Addis Ababa, PP. 74-75.

FIGURE 1

DUE TO COST CONSIDERATIONS MULTIPLE COPIES OF FIGURE 1 COULD NOT BE PRODUCED. READERS WISHING TO CONSULT THIS LARGE MAP CAN CONSULT COPIES RETAINED BY THE DEAN'S OFFICE, FACULTY OF GRADUATE STUDIES AND BY THE CHAIRMAN OF THE GEOGRAPHY DEPARTMENT, ADDIS ABABA UNIVERSITY.

DECLARATION

I, the undersigned declare that this thesis is my work and that all sources of material used for the thesis have been duly acknowledged.

NAME: AMANUEL WORQUE ABEBE

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DATE OF SUBMISSION: JULY 4/1989.